


Temporal trends of tracheal, bronchus, and lung cancer between 2010 and 2019, in Asian countries by geographical region and sociodemographic index, comparison with global data

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Abstract

Background: This study aimed to describe the trends in incidence, mortality, and burden of tracheal, bronchial and lung (TBL) cancer in Asia from 2010 through 2019 and compare with global and other continental data.

Methods: We collected TBL cancer data from the 2019 Global Burden of Disease (GBD) study from 2010 to 2019 in 49 countries and territories in Asia. For all locations, annual case data and age-standardized rates (ASRs) were used to investigate the incidence, prevalence, mortality, and disability-adjusted life-years (DALYs) of TBL from 2010 to 2019. The relative difference (%) between years was used to show comparative variations of ASRs for the indicators studied.

Results: In 2019, more than 55% of TBL cancer cases and deaths occurred in Asian countries. A total of 57% of lung cancer patients lived in Asia and almost 60% of the global burden of lung cancer was imposed on Asian countries. From 2010 to 2019, incidences, deaths, prevalence cases, and DALYs number of TBL cancer increased over 1.34-, 1.31-, 1.31-, and 1.26-fold, in Asia. During this period, the age-standardized incidence rate (ASIR), the age-standardized death rate (ASDR), the age-standardized prevalence rate (ASPR), and the age-standardized DALYs rate (DALYs ASR) of TBL cancer decreased by 1, 3, 4, and 4%, respectively. While at the same time, the decreasing trend of these rates globally and in America and in Europe happened faster. In 2019, age-specific incidence, death, prevalence, and DALY cases of TBL cancer were peaking at 65–74, 70–74, 65–69, and 65–69 years, respectively. In 2019, the highest ASIR, ASDR, and DALYs ASR of TBL cancer was observed in East Asia countries and the highest ASPR in high-income Asia Pacific countries. Central Asia and high-income Asia Pacific countries experienced a decreasing trend in ASIR and ASDR, and the South Asia countries experienced the highest increasing trend from 2010 to 2019. ASPR only decreased in Central Asia, and DALYs ASR only increased in South Asia. In 2019, among high sociodemographic index (SDI) Asian countries, Brunei Darussalam had the highest ASIR, ASDR, and DALYs ASR and the Republic of Korea had the highest ASPR. Among high-middle SDIs, Turkey and Georgia; among middle SDIs, China and Armenia; among low-middle SDIs, Mongolia and the Democratic People's Republic of Korea had the highest ASIR, ASDR, ASPR, and DALY ASR of TBL cancer. Among low SDI Asian countries, Pakistan had the highest ASIR, ASDR, ASPR, and DALY ASR of TBL cancer.

Conclusion: Most of the global burden of lung cancer occurs in Asian countries, and the decreasing trend of incidence, death, prevalence, and burden of this cancer in

these countries is slower than in other regions. Therefore, the implementation of necessary measures in order to reduce the process of this cancer is considered urgent.

KEYWORDS

Asia, bronchus, burden, incidence, Lungl, mortality, prevalence

INTRODUCTION

One of the worldwide leading causes of death is cancer and its burden is not consistent.¹ Particularly between developing and developed countries, the incidence, mortality, and disability-adjusted life year (DALY) burden of cancer vary considerably across countries and regions.^{2–5}

Globally, TBL cancers are among important public health issues and the burden of these cancers varies in different countries.^{6,7} In the past few decades, lung cancer has been the most common malignancy and cause of cancer deaths.⁸ Furthermore, lung cancer remains the leading cause of cancer-related deaths in men and women⁹ and an important public health issue due to a 5-year survival rate of 17.8%¹⁰ and a high fatality rate.¹¹

According to the latest GLOBOCAN estimates of cancer incidence and mortality in 2020, a total of 2 206 771 new cases were estimated, accounting for 11.4% of all new cancer diagnoses.¹² In addition, according to the Global Cancer Observatory: Cancer Today statistics by the International Agency for Research on Cancer (IARC), after breast and prostate cancer, lung cancer had the third highest incidence and mortality in Asia in 2020.¹³ In 2020, the Global Burden of Disease (GBD) study reported that the worldwide healthcare burden and costs attributed to lung cancer are significant.¹⁴ In males and females, the age-standardized cumulative lifetime risk of lung cancer diagnosis is 3.8% and 1.77%, respectively.^{7,13} In Asia, the highest age-standardized rate has been shown in Turkey and the lowest age-standardized rate in Saudi Arabia.^{15,16}

Lung cancer has several risk factors. Nonmodifiable risk factors include; age, gender, family history and race/ethnicity, and modifiable risk factors include; tobacco smoking, cannabis smoking, asbestos, radon, arsenic, air pollution, infection, and chronic obstructive pulmonary diseases.¹⁷ Lung cancer is more prevalent among men, individuals >60 years old, African Americans, and people with a positive family history.¹⁷ Tobacco smoking is the most important risk factor for lung cancer, and 81.7% of lung cancer cases and 81.3% of lung cancer deaths are closely related to cigarette smoking.¹⁸ In smokers, the relative risk of lung cancer is about 20-fold higher than in nonsmokers.¹⁹ On the other hand, the worldwide incidence of lung cancer is on the rise with increased industrialization.²⁰ In this study, the trends of incidence, mortality, and burden of TBL cancer in Asia from 2010 through 2019 based on the sociodemographic index (SDI) are described and these data compared with the trend in global and other continents.

METHODS

Source data

The annual data for 49 Asian countries and territories and six GBD regions, global and continents in the context of incidence, prevalence, death, and the burden imposed by TBL cancer were extracted from the GBD 2019. The GBD 2019 were accessed via the online data source Global Health Data Exchange (GHDx) query tool (<http://ghdx.healthdata.org/gbd-results-tool>) based on the International Classification of Diseases 10 (ICD-10) (code [C56.9] for TBL cancer). GBD estimates all available epidemiological data (incidence, mortality, prevalence, year of life lost [YLL], years lived with disability [YLD], and disability-adjusted life years [DALY]) by time, location, gender, and age group for the comparative assessment of health loss due to 364 diseases and injuries across 204 countries and territories from 1990 to 2019.^{21,22}

In this study, data were extracted for various classifications of Asian countries on the basis of a sociodemographic index (SDI), and six GBD regions of Asia from 2010 to 2019 and compared with worldwide and other continental data. Specifically, we used data for North Africa and the Middle East, given that 15 out of 21 GBD countries in North Africa and the Middle East belong to West Asia. In Southeast Asian countries, two were also from Africa.

GBD has developed a standardized international form of quality-adjusted life year (QALY), known as the DALY, and is defined as a wasted year of healthy living as a result of premature death and years with a disability of specific severity and duration. "Premature" death is a death that occurs at an age when a person's death is not expected. The expected age at death for a person is calculated based on the predicted death for a certain age in a population standardized to the population of Japan, which has the longest life expectancy at birth in the world. The total number of DALYs for a given condition within a population is equal to the sum of years of life lost (YLLs) and years of disability of known severity and duration (YLDs).^{23,24}

The SDI is the geometric average of three indicators: (1) lag-distributed income per capita, (2) average educational attainment of people aged 15 years and older, and (3) the total fertility rate (in people aged <25 years).²⁵ The SDI is the reflection of levels of social and economic conditions that can affect health outcomes in a given location. Countries and territories were categorized into five groups based on SDI values: low SDI (<0.45), low-middle SDI (≥ 0.45 and <0.61), middle SDI (≥ 0.61 and <0.69), high-middle SDI (≥ 0.69 and <0.80), and high SDI (≥ 0.80).^{26,27}

An age-standardized rate (ASR) is a weighted average of the age-specific rates per 100 000 persons, where the weights are the proportions of people within the corresponding age groups of the WHO standard population. Age-standardized rates take into account differences in the age distribution of the population by applying the rates for each population to a standardized population.²⁸

Ethical considerations

The study was approved by the Ethics Committee of the Jahrom University of Medical Sciences in Iran (IR.JUMS.REC.1401.094). Informed consent was not necessary due to the use of the anonymous online dataset.

Statistical analysis

To remove the influence of the composition of different age groups within populations, incidence, prevalence, deaths, DALY and age-standardized rates are expressed per 100 000 population. The data are reported as values with 95% confidence intervals (CI). Selected epidemiological indicators are presented separately for each classification system. To show comparative changes in incidence, prevalence, mortality, and age-standardized rates, the relative difference (%) between years was used. The relative difference was calculated by dividing the value of the absolute difference by the value of the year of origin, which was then multiplied by 100.²⁹ The definition of what was used can be accessed via <https://www.healthdata.org/terms-defined> and <https://www.healthdata.org/gbd/>.

RESULTS

Morbidity of TBL cancer in Asia

Compared with global data and continents

In Asia, the number of TBL cancer incidences increased from 975 361 (95% CI: 909 679–1 037 802) in 2010 to 1 305 525 (95% CI: 1 150 171–1 455 350) in 2019, which is over a 1.34-fold increase. In 2019 approximately 58% (1 305 525/2 259 998) of TBL cancer cases happened in Asian countries. During this period, the ASIR of TBL cancer with a 1% change, decreased from 28.08 (95% CI: 26.16–29.89) per 100 000 in 2010 to 27.82 (95% CI: 24.56–30.95) per 100 000 in 2019, while in the same time, this rate globally decreased by 5%, in America by 10%, and in Europe by 7% (Figure 1 and Table 1).

In Asian men, the number of TBL cancer incidences increased from 695 259 (95% CI: 643 022–750 702) in 2010 to 906 593 (95% CI: 771 042–1 049 246) in 2019, which is over a 1.3-fold increase. In 2019 approximately 69.4% of Asia TBL cancer new cases, occurred in Asian men which

included 59.5% (906 593/1 522 773) of global male TBL cancer incidence cases. During this period, the ASIR of TBL cancer with a 3% change, decreased from 42.54 (95% CI: 39.28–45.84) per 100 000 in 2010 to 41.16 (95% CI: 35.32–47.32) per 100 000 in 2019, while in the same time, this rate globally decreased by 7%, in America and Europe by 12% (Table 2).

In Asian women, the number of TBL cancer incidences increased from 280 101 (95% CI: 256 006–302 969) in 2010 to 398 932 (95% CI: 339 662–464 457) in 2019, which is over a 1.42-fold increase. In 2019 approximately 30.6% of Asia TBL cancer new cases, occurred in Asian women which included 54.1% (398 932/737 225) of global female TBL cancer incidence cases. During this period, the ASIR of TBL cancer with a 5% change, increased from 15.48 (95% CI: 14.07–16.76) per 100 000 in 2010 to 16.21 (95% CI: 13.74–18.85) per 100 000 in 2019, while in the same time, this rate globally increased by 1%, in Africa by 12%, and in Europe by 3%, and in American countries decreased by 8% (Table 3).

Age distribution

In 2019, age-specific incidence cases of TBL cancer were generally peaking at 65–74 years, 65–69 years in males, and 70–74 years in females. In all age groups, the incidence cases of TBL cancer in males was higher, except in ages above 90 years which in females was higher (Figure 2).

Within Asian regions

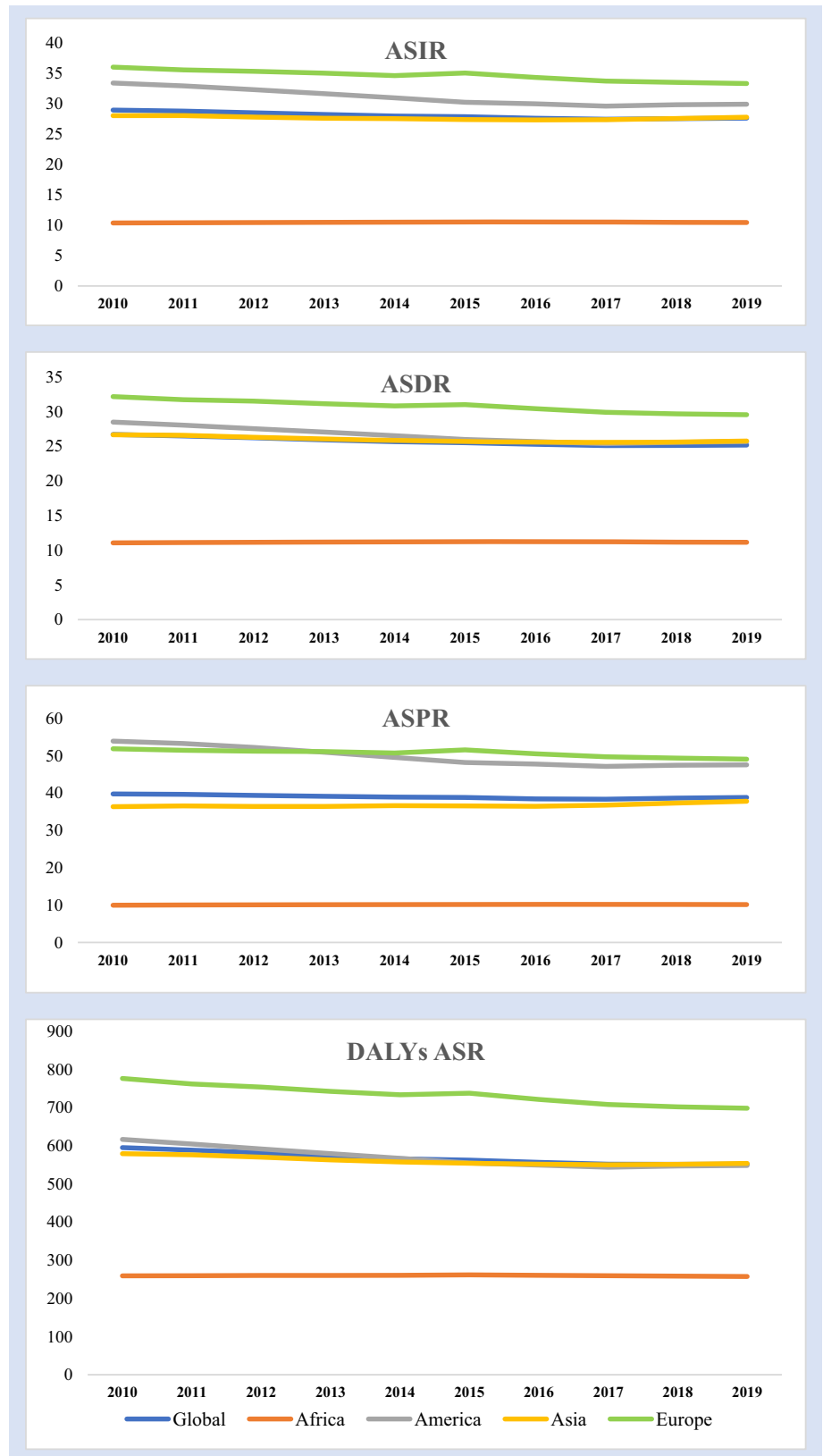
In 2019, the highest ASIR of TBL was observed in East Asian countries (41.31 [95% CI: 35.03–48.11]); without any changes compared with 2010. While the Central Asia and high-income Asia Pacific countries experienced a decreasing trend of 10% and 7%, respectively; the South Asian countries experienced the highest increasing trend from 2010 to 2019 (by 7%) (Figure 3).

In men, the highest ASIR of TBL was observed in East Asian countries (61.06 [95% CI: 48.89–73.86]); with a 1% decrease compared with 2010. While the Central Asia and high-income Asia Pacific countries experienced a decreasing trend of 8% and 14%, respectively; the Southeast Asia countries experienced an increasing trend from 2010 to 2019 by 1%.

In women, the highest ASIR of TBL was observed in East Asian countries (24.55 [95% CI: 19.85–29.85]) in 2019, these countries and other countries experienced an increasing trend from 2010 to 2019 except high-income Asia Pacific countries that experienced a decreasing trend by 2%. South Asia countries experienced the highest increasing trend from 2010 to 2019 (by 32%).

Among high SDI Asian countries, Brunei Darussalam (46.15) and the Republic of Korea (35.61) had the highest ASIR of TBL, and Saudi Arabia (8.77) had the lowest rate.

FIGURE 1 Temporal trend of incidence, prevalence, death and DALYs age standard rates (per 100 000 population) of TBL cancer in ASIA comparison with global data and other continents from 1990 to 2019.



Based on SDI

Among high SDI Asian countries, Brunei Darussalam (45.16) and the Republic of Korea (35.61) had the highest

ASIR of TBL, and Saudi Arabia (8.77) had the lowest rate. Among high-middle SDI Asian countries, Turkey (33.08) and Georgia (31.14) had the highest ASIR of TBL, and Sri Lanka (9.71) had the lowest rate. Among middle SDI

T A B L E 1 Comparison of the incidence, death, prevalence, and burden rates of TBL cancer in Asian countries in 2010 and 2019 and the temporal trends between 2010 and 2019 (both sexes).

Location	Incidence				Death				% change 2010–2019 (95% CI)
	2010		2019		2010		2019		
	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	
Global	1 832 625 (1 747 456–1 909 105)	28.99 (27.58–30.18)	2 259 998 (2 067 316–2 451 832)	27.66 (25.28–29.99)	1 670 745 (1 592 451–1 737 302)	26.70 (25.29–27.77)	2 042 640 (1 879 241–2 193 269)	25.18 (23.16–27.01)	-0.06 (-0.13–0.02)
Continents									
Africa	47 663 (42 695–54 096)	10.39 (9.34–11.73)	63 899 (57 033–71 562)	10.46 (9.4–11.63)	49 125 (44 347–55 559)	11.07 (10–12.43)	65 621 (58 557–74 115)	11.15 (9.99–12.4)	0.01 (-0.08–0.1)
America	331 037 (316 473–339 397)	33.45 (32.01–34.28)	385 406 (345 604–429 508)	29.96 (26.86–33.37)	282 630 (268 084–290 210)	28.49 (27.07–29.23)	331 172 (309 812–345 847)	25.67 (24.05–26.8)	-0.10 (-0.13–0.07)
Asia	975 361 (909 679–1 037 802)	28.08 (26.16–29.89)	1 305 525 (1 150 171–1 455 350)	27.82 (24.56–30.95)	906 650 (846 561–964 850)	26.66 (24.77–28.33)	1 190 516 (1 052 836–1 330 529)	25.76 (22.79–28.72)	-0.03 (-0.15–0.09)
Europe	476 813 (459 978–486 467)	36.07 (34.9–36.76)	503 130 (455 166–552 462)	33.37 (30.25–36.73)	430 658 (413 701–440 000)	32.16 (31.01–32.82)	453 373 (426 326–476 093)	29.55 (27.88–31.01)	-0.08 (-0.12–0.04)
Countries by geographical location									
Central Asia	11 934 (11 487–12 356)	20.23 (19.45–20.94)	14 342 (12 983–15 870)	18.91 (17.14–20.76)	11 820 (11 373–12 240)	20.47 (19.68–21.2)	13 990 (12 661–15 452)	19.04 (17.29–20.86)	-0.07 (-0.15–0.02)
East Asia	628 151 (575 530–685 242)	41.17 (37.73–44.79)	854 582 (721 022–1 002 044)	41.31 (35.03–48.11)	594 187 (541 920–645 351)	39.99 (36.53–43.35)	778 387 (658 108–907 254)	38.38 (32.72–44.57)	-0.04 (-0.19–0.14)
High-income Asia Pacific	131 569 (119 593–138 366)	34.89 (32.07–36.51)	150 900 (126 657–173 088)	31.57 (26.96–36.26)	95 867 (85 867–101 050)	24.78 (22.5–25.98)	110 970 (96 055–119 283)	22.17 (19.73–23.56)	-0.11 (-0.13–0.08)
North Africa and Middle East	52 191 (48 178–56 416)	16.66 (15.33–17.98)	71 681 (63 424–81 049)	16.83 (14.91–19.02)	53 176 (48 971–57 366)	17.44 (16.03–18.79)	72 510 (64 112–81 925)	17.55 (15.56–19.82)	0.01 (-0.1–0.13)
South Asia	80 950 (74 897–86 782)	7.84 (7.24–8.41)	117 195 (100 085–133 943)	8.36 (7.14–9.52)	82 457 (76 287–88 125)	8.25 (7.61–8.85)	119 644 (101 195–137 368)	8.75 (7.44–10.05)	0.06 (-0.09–0.21)
Southeast Asia	96 767 (87 575–106 118)	21.48 (19.42–23.5)	132 529 (110 981–153 557)	21.99 (18.43–25.41)	98 814 (90 026–107 961)	22.62 (20.57–24.72)	134 566 (112 781–155 885)	23.00 (19.25–26.63)	0.02 (-0.1–0.14)
DALY									
Prevalence									
2010									
Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)
2 557 647 (2 451 258–2 653 706)	39.76 (38.02–41.26)	3 212 307 (2 937 037–3 488 346)	38.84 (35.49–42.16)	38 816 797 (37 161 595–40 409 438)	595.08 (569.46–619.44)	45 857 963 (42 297 425–49 339 876)	551.58 (508.97–593.12)	45 857 963 (42 297 425–49 339 876)	-0.07 (-0.15–0)
2019									
Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)
48 619 (43 488–55 370)	9.97 (8.93–11.32)	66 194 (58 602–74 477)	10.14 (9.06–11.34)	1 297 006 (1 157 918–1 478 946)	258.89 (232.57–293.8)	1 724 110 (1 518 047–1 970 898)	257.28 (228.41–292.12)	1 724 110 (1 518 047–1 970 898)	-0.01 (-0.1–0.1)

TABLE 1 (Continued)

Location	Prevalence						DALY						
	2010			2019			2010			2019			% change 2010–2019 (95% CI)
	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	
America	532 344 (512 813–546 055)	53.91 (51.96–55.3)	-0.12 (-0.22–0.01)	609 633 (542 652–684 277)	47.55 (42.33–53.36)	-0.12 (-0.22–0.01)	6 111 998 (5 919 808–6 223 069)	616.56 (597.39–627.78)	-0.11 (-0.14–0.08)	6 982 073 (6 655 043–7 266 920)	548.34 (522.67–570.79)	-0.11 (-0.14–0.08)	
Asia	1 308 776 (1 225 459–1 392 332)	36.35 (34.01–38.67)	0.04 (-0.09–0.17)	1 820 539 (1 605 530–2 034 496)	37.81 (33.46–42.14)	0.04 (-0.09–0.17)	21 516 974 (20 162 682–22 913 727)	579.16 (543.52–616.66)	-0.04 (-0.16–0.09)	27 120 537 (23 951 875–30 414 194)	553.68 (488.57–619.78)	-0.04 (-0.16–0.09)	
Europe	665 767 (644 824–680 187)	51.86 (50.39–52.93)	-0.05 (-0.15–0.05)	713 441 (642 607–790 401)	49.08 (44.21–54.34)	-0.05 (-0.15–0.05)	9 853 259 (9 590 547–10 021 168)	776.31 (758.05–789.01)	-0.10 (-0.14–0.06)	9 988 808 (9 442 180–10 489 803)	698.29 (660.78–732.91)	-0.10 (-0.14–0.06)	
Countries by geographical location													
Central Asia	13 055 (12 554–13 538)	21.17 (20.33–21.93)	-0.05 (-0.14–0.05)	16 240 (14 651–18 063)	20.13 (18.23–22.19)	-0.05 (-0.14–0.05)	327 135 (315 044–338 748)	520.66 (500.81–539.35)	-0.09 (-0.18–0.01)	387 448 (349 153–429 746)	473.70 (428.64–523.63)	-0.09 (-0.18–0.01)	
East Asia	783 584 (715 846–857 024)	49.06 (44.9–53.51)	0.11 (-0.09–0.33)	1 163 481 (976 059–1 369 145)	54.46 (45.82–63.97)	0.11 (-0.09–0.33)	14 113 044 (12 887 293–15 406 968)	872.01 (797.95–948.78)	-0.05 (-0.21–0.14)	17 614 063 (14 810 292–20 721 521)	825.81 (696.85–969.46)	-0.05 (-0.21–0.14)	
High-income Asia Pacific	288 182 (267 010–304 566)	80.42 (75.25–84.6)	-0.08 (-0.19–0.06)	326 643 (276 230–376 769)	74.32 (63.96–85.75)	-0.08 (-0.19–0.06)	1 745 570 (1 622 311–1 810 575)	494.73 (464.58–510.51)	-0.14 (-0.16–0.11)	1 830 128 (1 654 973–1 933 641)	427.39 (395.68–448.33)	-0.14 (-0.16–0.11)	
North Africa and Middle East	55 161 (50 926–59 688)	16.74 (15.46–18.13)	0.03 (-0.09–0.16)	77 317 (68 022–87 610)	17.17 (15.15–19.45)	0.03 (-0.09–0.16)	1 389 718 (1 283 476–1 507 225)	412.53 (380.92–447.32)	-0.01 (-0.13–0.11)	1 870 025 (1 648 815–2 118 436)	406.65 (359.1–459.46)	-0.01 (-0.13–0.11)	
South Asia	84 029 (77 729–90 153)	7.72 (7.13–8.27)	0.08 (-0.08–0.24)	121 387 (103 595–139 072)	8.31 (7.1–9.5)	0.08 (-0.08–0.24)	2 207 925 (2 042 685–2 363 198)	198.52 (183.68–212.2)	0.05 (-0.11–0.21)	3 089 930 (2 617 375–3 550 873)	208.53 (176.65–239.62)	0.05 (-0.11–0.21)	
Southeast Asia	102 121 (92 437–112 157)	21.45 (19.46–23.5)	0.04 (-0.09–0.18)	141 713 (118 238–165 160)	22.31 (18.65–25.86)	0.04 (-0.09–0.18)	2 580 293 (2 343 315–2 826 856)	530.60 (483.12–580.93)	0.00 (-0.12–0.13)	3 429 720 (2 859 905–3 965 337)	532.93 (445.89–615.84)	0.00 (-0.12–0.13)	

Abbreviations: CI, confidence interval; TBL, tracheal, bronchial and lung.

TABLE 2 (Continued)

Location	Prevalence						DALY					
	2010			2019			2010			2019		
	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	
Continents												
Africa	37 211 (32 606–43 427)	15.64 (13.77–18.18)	-0.01 (-0.11–0.11)	48 599 (42 835–55 456)	15.49 (13.7–17.58)	-0.01 (-0.11–0.11)	996 182 (874 751–1 168 008)	407.65 (360.63–474.74)	1 273 661 (1 115 235–1 475 387)	395.57 (348.98–453.39)	-0.03 (-0.13–0.09)	
America	280 546 (271 942–287 853)	62.13 (60.11–63.8)	-0.13 (-0.25–0.01)	318 385 (274 446–370 922)	53.95 (46.52–62.82)	-0.13 (-0.25–0.01)	3 578 682 (3 486 125–3 640 976)	782.87 (761.01–796.82)	4 019 140 (3 866 967–4 175 479)	681.21 (654.95–707.55)	-0.13 (-0.16–0.1)	
Asia	928 147 (861 104–1 000 537)	54.01 (50.08–58.12)	0.02 (-0.13–0.18)	1 257 715 (1 069 513– 1 462 350)	54.94 (46.96–63.32)	0.02 (-0.13–0.18)	15 471 795 (14 340 748– 16 696 371)	862.61 (800.85–929.03)	19 032 930 (16 188 395– 21 991 610)	806.43 (688.15–928.33)	-0.07 (-0.21–0.1)	
Europe	469 031 (456 266–479 691)	82.35 (80.06–84.24)	-0.11 (-0.2–0.01)	483 071 (434 425–538 524)	73.66 (66.24–82.02)	-0.11 (-0.2–0.01)	7 371 434 (7 210 498–7 495 109)	1296.88 (1268.24–1318.81)	7 228 445 (6 786 085–7 659 648)	1112.90 (1044.81–1178.58)	-0.14 (-0.19–0.09)	
Countries by geographical location												
Central Asia	10 445 (9966–10 916)	38.69 (36.98–40.34)	-0.07 (-0.17–0.03)	12 747 (11 269–14 251)	35.93 (31.94–39.9)	-0.07 (-0.17–0.03)	262 480 (250 744–274 008)	950.54 (909.87–992.11)	305 280 (269 545–342 706)	845.18 (750.29–941.04)	-0.11 (-0.2–0.01)	
East Asia	549 320 (489 021–614 703)	71.26 (63.72–79.36)	0.09 (-0.14–0.39)	798 517 (623 900–988 417)	78.03 (61.43–95.66)	0.09 (-0.14–0.39)	10 022 616 (8 962 494–11 190 274)	1276.56 (1148.68–1419.36)	12 285 616 (970 2712–15 269 024)	1195.54 (949.99–1478.03)	-0.06 (-0.27–0.18)	
High-income Asia Pacific	207 771 (194 401–219 959)	129.02 (121.06–136.58)	-0.11 (-0.26–0.06)	229 777 (191 569–273 165)	114.22 (95.69–135.71)	-0.11 (-0.26–0.06)	1 293 998 (1 225 352–1 335 843)	813.32 (770.31–839.29)	1 318 234 (1 219 937–1 388 347)	670.81 (624.48–704.7)	-0.18 (-0.21–0.15)	
North Africa and Middle East	43 906 (40 334–47 853)	26.37 (24.21–28.71)	-0.03 (-0.15–0.11)	58 612 (51 424–66 749)	25.59 (22.48–29.12)	-0.03 (-0.15–0.11)	1 129 551 (1 037 014–1 231 394)	663.37 (609.93–724.26)	1 471 977 (1 292 740–1 675 771)	629.27 (554.11–713.7)	-0.05 (-0.17–0.09)	
South Asia	65 683 (59 942–71 764)	12.12 (11.06–13.21)	0.01 (-0.17–0.22)	88 383 (72 063–105 442)	12.28 (10.04–14.62)	0.01 (-0.17–0.22)	1 720 712 (1 574 121–1 878 619)	310.76 (283.66–338.27)	2 242 983 (1 835 005–2 652 810)	306.69 (251.04–361.99)	-0.01 (-0.2–0.18)	
Southeast Asia	71 517 (65 595–78 128)	32.53 (29.89–35.41)	0.02 (-0.13–0.19)	97 906 (81 821–114 685)	33.25 (27.99–38.75)	0.02 (-0.13–0.19)	1 810 079 (1 666 282–1 968 106)	804.60 (742.9–872.82)	2 378 099 (1 995 969–2 766 343)	795.16 (672.65–921.59)	-0.01 (-0.15–0.14)	

Abbreviations: CI, confidence interval; TBL, tracheal, bronchial and lung.

TABLE 3 (Continued)

Location	Prevalence						DALY					
	2010			2019			2010			2019		
	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)
Continents												
Africa	11 408 (10 366–12 602)	4.54 (4.15–4.99)	0.14 (0.01–0.25)	17 596 (15 351–19 862)	5.17 (4.58–5.79)	0.14 (0.01–0.25)	300 825 (271 961–331 332)	116.06 (105.52–127.2)	0.11 (–0.02–0.23)	450 450 (390 478–514 074)	128.37 (111.98–145.41)	0.11 (–0.02–0.23)
America	251 798 (240 507–260 562)	47.23 (45.24–48.84)	–0.10 (–0.24–0.05)	291 248 (246 138–341 703)	42.31 (35.74–49.7)	–0.10 (–0.24–0.05)	2 533 317 (2 428 813–2 599 251)	474.98 (456.25–486.94)	–0.08 (–0.13–0.03)	2 962 933 (2 776 613–3 144 654)	434.89 (408.17–460.97)	–0.08 (–0.13–0.03)
Europe	380 630 (349 763–411 327)	20.43 (18.67–22.08)	0.10 (–0.06–0.28)	562 824 (480 164–653 889)	22.49 (19.21–26.12)	0.10 (–0.06–0.28)	6 045 179 (5 551 988–6 575 776)	316.95 (290.95–344.55)	0.01 (–0.14–0.18)	8 087 606 (6 962 536–9 358 865)	321.18 (276.65–371.34)	0.01 (–0.14–0.18)
Asia	196 736 (187 564–203 168)	27.82 (26.7–28.66)	0.05 (–0.06–0.18)	230 370 (205 639–257 874)	29.17 (25.99–32.68)	0.05 (–0.06–0.18)	2 481 824 (2 377 313–2 540 942)	355.87 (343.94–363.58)	0.00 (–0.05–0.05)	2 760 363 (2 583 575–2 917 832)	354.87 (334.93–374.7)	0.00 (–0.05–0.05)
Countries by geographical location												
Central Asia	2611 (2518–2720)	7.54 (7.28–7.86)	0.06 (–0.05–0.18)	3492 (3111–3917)	7.98 (7.15–8.91)	0.06 (–0.05–0.18)	64 655 (62 448–67 272)	183.44 (176.8–191.03)	0.01 (–0.1–0.13)	82 168 (73 024–92 405)	185.27 (165.25–207.53)	0.01 (–0.1–0.13)
East Asia	234 264 (208 597–260 494)	28.75 (25.64–31.99)	0.16 (–0.08–0.45)	364 964 (293 511–447 082)	33.32 (26.81–40.82)	0.16 (–0.08–0.45)	4 090 428 (3 645 348–4 549 759)	497.71 (442.89–552.1)	–0.02 (–0.23–0.22)	5 328 447 (4 314 330–6 510 671)	489.73 (396.14–597.18)	–0.02 (–0.23–0.22)
High-income Asia Pacific	80 411 (70 235–87 650)	41.17 (37.37–44.11)	–0.01 (–0.15–0.16)	96 866 (79 104–114 755)	40.86 (34.13–48.03)	–0.01 (–0.15–0.16)	451 572 (395 398–481 572)	235.42 (213.57–247.32)	–0.07 (–0.1–0.03)	511 894 (437 678–555 713)	219.77 (197.35–234.68)	–0.07 (–0.1–0.03)
North Africa and Middle East	11 255 (10 374–12 083)	6.83 (6.29–7.34)	0.23 (0.07–0.39)	18 705 (16 152–21 456)	8.43 (7.27–9.65)	0.23 (0.07–0.39)	260 168 (240 453–279 924)	153.63 (141.58–165.39)	0.14 (–0.01–0.28)	398 048 (343 405–459 210)	174.91 (151.1–201.59)	0.14 (–0.01–0.28)
South Asia	18 346 (16 385–20 206)	3.35 (2.98–3.71)	0.33 (0.07–0.64)	33 004 (26 751–39 840)	4.46 (3.64–5.38)	0.33 (0.07–0.64)	487 213 (435 355–537 136)	86.82 (77.13–95.86)	0.30 (0.04–0.6)	846 947 (692 032–1 029 549)	112.79 (92.18–136.92)	0.30 (0.04–0.6)
Southeast Asia	30 604 (25 450–35 989)	12.01 (10.04–14.06)	0.08 (–0.07–0.25)	43 807 (33 416–55 120)	13.01 (9.98–16.28)	0.08 (–0.07–0.25)	770 214 (633 511–914 063)	295.65 (243.82–348.23)	0.04 (–0.11–0.2)	1 051 621 (796 523–1 324 390)	308.47 (233.06–387.26)	0.04 (–0.11–0.2)

Abbreviations: CI, confidence interval; TBL, tracheal, bronchial and lung.

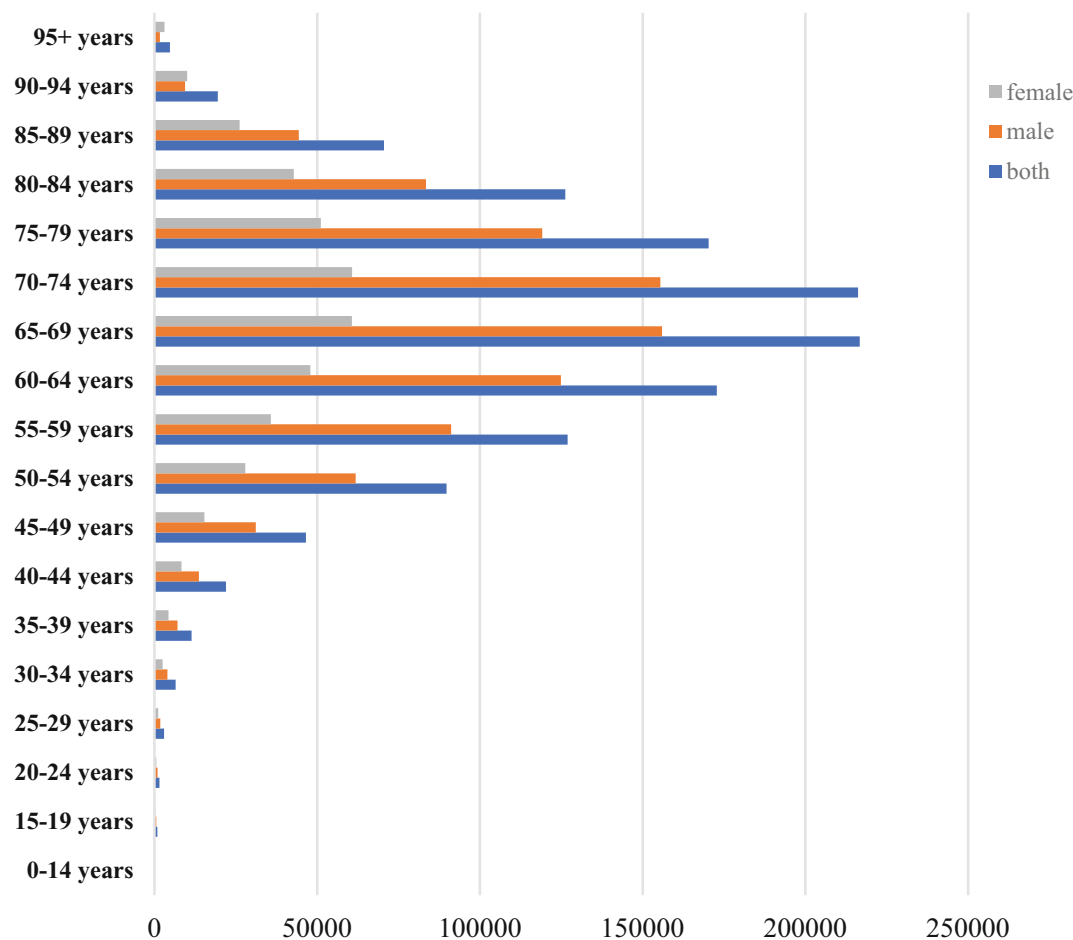


FIGURE 2 Age specific incidence cases of TBL cancer among sexes in Asia, 2019.

Asian countries, China (41.71) and Armenia (33.81) had the highest ASIR of TBL, and Turkmenistan (9.90) had the lowest rate. Among low-middle SDI Asian countries, Mongolia (31.19) and the Democratic People's Republic of Korea (27.87) had the highest ASIR of TBL, and Bangladesh (7.43) had the lowest rate. Among low SDI Asian countries, Pakistan (16.43) had the highest ASIR of TBL, and Nepal (8.03) had the lowest rate. Further details are presented in Table 4.

National comparison

Among Asian countries, 20 countries experienced an increasing trend in the TBL cancer morbidity rate between 2010 and 2019; the greatest increase was detected in Iraq (increase in ASIR = 0.21 [95% CI: 0–0.46]) and the greatest decrease was detected in the United Arab Emirates (decrease in ASIR = –0.18 [95% CI: –0.37–0.06]) (Figure 4).

In 2019, the highest ASIR (per 100 000) of TBL cancer was reported in Brunei Darussalam (46.15), China (41.71), the Republic of Korea (35.61), Turkey (33.08), and Taiwan (Province of China) (31.88). The lowest ASIR of TBL cancer was reported in Bangladesh (7.43), India (7.7), Bhutan

(7.73), Nepal (8.03), and Saudi Arabia (8.77). The national distribution of TBL cancer among men and women was the same as the overall distribution; however, men in Georgia had the highest ASIR rate (62.13). Detailed results are presented in Table 4.

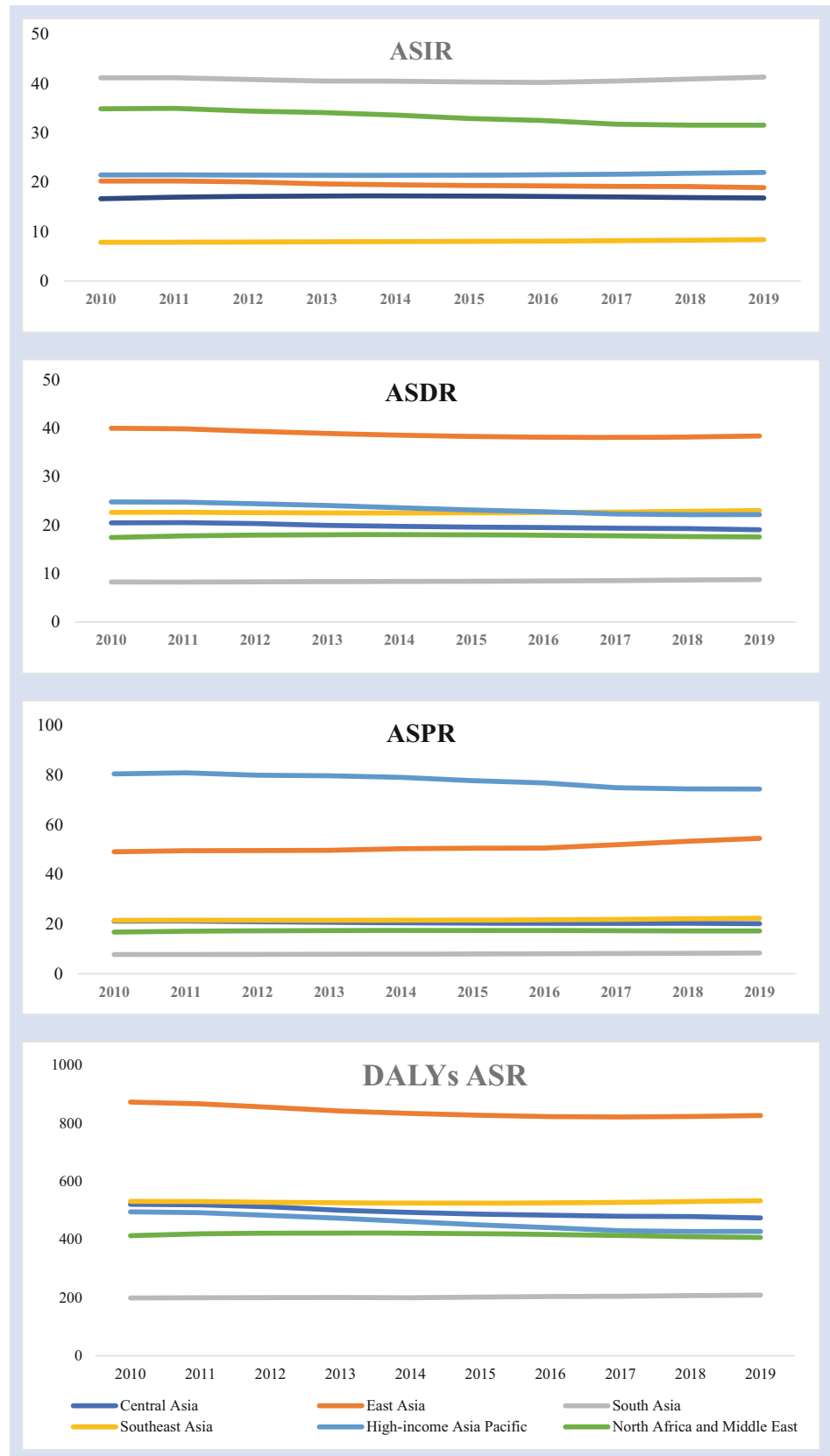
Mortality of TBL cancer in Asia

Compared with global data and continents

In Asia, the number of TBL cancer deaths increased from 906 650 (95% CI: 846 561–964 850) in 2010 to 1 190 516 (95% CI: 1 052 836–1 330 529) in 2019, which is over a 1.31-fold increase. In 2019 more than 58% (1 190 516/2 042 640) of TBL cancer deaths happened in Asian countries. During this period, the ASDR of TBL cancer with a 3% change, decreased from 26.66 (95% CI: 24.77–28.33) per 100 000 in 2010 to 25.76 (95% CI: 22.79–28.72) per 100 000 in 2019, while in the same time, this rate globally decreased by 6%, in America by 10%, and in Europe by 8% (Figure 1 and Table 1).

In Asian men, the number of TBL cancer deaths increased from 646 099 (95% CI: 599 147–694 710) in 2010 to 825 738 (95% CI: 706 207–949 796) in 2019, which is

FIGURE 3 Temporal trend of incidence, prevalence, death and DALYs age standard rates (per 100 000 population) of TBL cancer in Asian regions from 1990 to 2019.



over a 1.28-fold increase. In 2019 approximately 69.4% of Asian TBL cancer deaths occurred in Asian men which included 60% (825 738/1 386 094) of global male TBL

cancer death cases. During this period, the ASDR of TBL cancer with a 6% change, decreased from 40.66 (95% CI: 37.75–43.57) per 100 000 in 2010 to 38.3 (95% CI: 33–

TABLE 4 Incidence distribution of TBL cancer in Asian countries in 2010 and 2019 and the temporal trends between 2010 and 2019, by geographical region and SDI.

Location	SDI 2019 lower (95% CI)	Both						Male						Female					
		2010		2019		% change 2010-2019 (95% CI)		2010		2019		% change 2010-2019 (95% CI)		2010		2019		% change 2010-2019 (95% CI)	
		Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)
High SDI																			
Brunei	0.823	75	46.27	116	60.33	63	61.02	33	36.25	53	37.94	0.05							
Danussalam			(42.48-50.29)	(102-130)	(40.91-51.83)	(-0.13-0.13)	(38-47)	(53.39-67.93)	(52-75)	(51.36-71.21)	(-0.16-0.21)	(29-37)	(32.03-40.41)	(44-63)	(32.3-44.03)	(-0.13-0.25)			
Cyprus	0.841	402	28.10	514	26.03	314	48.19	398	42.31	88	11.61	-0.12							
			(26.17-30)	(444-592)	(22.56-30.01)	(-0.21-0.08)	(289-339)	(44.52-51.86)	(330-469)	(35.14-49.85)	(-0.28-0.05)	(79-98)	(10.48-12.77)	(95-138)	(9.37-13.59)	(-0.2-0.17)			
Israel	0.803	2177	25.06	2670	23.37	1454	37.13	1752	33.44	722	14.94	-0.10							
			(23.75-26.11)	(2088-3391)	(18.1-29.71)	(-0.27-0.18)	(1379-1533)	(35.22-39.1)	(1347-2241)	(25.75-42.7)	(-0.31-0.15)	(664-771)	(13.82-15.89)	(724-1168)	(11.54-18.64)	(-0.22-0.24)			
Japan	0.87	107 228	34.48	116 798	30.66	77 692	57.88	81 717	49.05	29 535	16.57	-0.15							
			(31.52-36.12)	(95 776-136 541)	(25.55-36)	(-0.24-0.04)	(71 790-81 155)	(53.74-60.37)	(66 731-99 572)	(40-59.9)	(-0.3-0.03)	(24 210-32 466)	(14.34-17.85)	(26 628-42 644)	(12.55-19.49)	(-0.2-0.16)			
Kuwait	0.851	129	10.02	225	10.10	98	12.48	173	13.28	31	5.92	0.06							
			(9.15-10.72)	(185-272)	(8.19-12.19)	(-0.3-0.04)	(90-105)	(11.35-13.45)	(133-216)	(10.29-16.6)	(-0.17-0.34)	(28-34)	(5.24-6.53)	(41-66)	(4.08-6.47)	(-0.3-0.09)			
Qatar	0.83	69	21.90	125	18.78	58	26.31	103	21.19	11	12.28	-0.19							
			(18.02-26.44)	(89-174)	(14.38-23.88)	(-0.19-0.27)	(45-73)	(20.85-32.57)	(71-149)	(15.97-27.58)	(-0.41-0.09)	(9-13)	(9.85-14.95)	(16-27)	(9.21-14.72)	(-0.23-0.17)			
Republic of Korea	0.878	22 698	36.90	31 825	35.61	16 431	65.28	22 655	59.14	6266	17.78	-0.09							
			(34.36-39.47)	(26 456-37 538)	(29.58-41.94)	(-0.35-0.11)	(15 413-17 712)	(60.97-70.45)	(18 637-27 109)	(48.64-70.35)	(-0.25-0.08)	(5647-6772)	(15.98-19.21)	(7492-10 916)	(14.97-21.76)	(-0.14-0.21)			
Saudi Arabia	0.805	1032	9.13	1545	8.77	771	12.14	1115	10.94	261	5.08	-0.10							
			(8.21-10.31)	(1187-1900)	(6.98-10.62)	(-0.19-0.14)	(680-897)	(10.9-14.02)	(841-1392)	(8.54-13.69)	(-0.29-0.11)	(225-299)	(4.44-5.78)	(321-551)	(4.16-6.88)	(-0.17-0.35)			
Singapore	0.861	1568	33.19	2162	28.39	1021	48.41	1371	38.69	547	21.28	-0.20							
			(30.81-35.1)	(1724-2713)	(22.71-35.43)	(-0.22-0.16)	(951-1085)	(44.94-51.53)	(1081-1724)	(30.75-48.3)	(-0.37-0)	(498-592)	(19.27-23.06)	(627-991)	(15.65-24.76)	(-0.25-0.15)			
Taiwan (Province of China)	0.868	10 295	34.33	12 618	31.88	6690	46.05	7802	42.62	3605	23.35	-0.07							
			(32.27-35.75)	(9963-16 206)	(25.21-40.93)	(-0.27-0.18)	(6311-6979)	(43.42-48.07)	(6140-9885)	(33.46-54.21)	(-0.27-0.19)	(3337-3813)	(21.55-24.72)	(3751-6185)	(17.78-29.35)	(-0.23-0.25)			
United Arab Emirates	0.88	227	22.85	542	18.62	176	25.31	434	21.52	51	18.43	-0.15							
			(18.93-26.98)	(393-721)	(13.54-25.75)	(-0.37-0.06)	(138-216)	(20.35-30.9)	(310-593)	(15.82-29.85)	(-0.33-0.09)	(40-63)	(14.8-22.63)	(72-145)	(7.5-19.26)	(-0.58-0.1)			
High-middle SDI																			
Bahrain	0.751	85	24.23	141	19.84	62	34.52	104	26.50	23	13.99	-0.23							
			(21.4-27.15)	(107-186)	(15.2-25.09)	(-0.36-0.02)	(53-71)	(29.94-39.4)	(75-142)	(19.94-34.33)	(-0.42-0)	(20-26)	(12.09-16.15)	(29-45)	(9.96-15.05)	(-0.28-0.07)			
Georgia	0.702	1662	29.30	1784	31.14	1400	58.14	1515	62.13	261	7.81	0.07							
			(26.6-31.96)	(1487-2108)	(25.89-36.87)	(-0.13-0.29)	(1252-1545)	(52.05-64.25)	(1251-1796)	(51.46-73.5)	(-0.13-0.3)	(235-290)	(7.01-8.66)	(224-322)	(6.65-9.7)	(-0.18-0.26)			
Jordan	0.731	485	15.10	914	14.34	383	23.14	697	20.90	102	6.42	-0.10							
			(13.47-16.94)	(748-1110)	(11.86-17.36)	(-0.23-0.14)	(336-437)	(20.32-26.46)	(537-882)	(16.3-26.2)	(-0.3-0.14)	(87-117)	(5.51-7.41)	(171-277)	(5.69-9.03)	(-0.11-0.4)			

TABLE 4 (Continued)

Location	SDI lower	Both						Male						Female					
		2010		2019		% change 2010-2019		2010		2019		% change 2010-2019		2010		2019		% change 2010-2019	
		Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)
Kazakhstan	0.723	3740 (3558-3945)	25.91 (24.65-27.24)	3829 (3259-4406)	21.36 (18.36-24.44)	-0.14 (-0.31-0.06)	3062 (2885-3267)	52.86 (49.82-56.14)	3047 (2577-3559)	41.77 (35.53-48.48)	-0.21 (-0.33-0.08)	678 (641-718)	8.02 (7.58-8.48)	782 (656-915)	7.67 (6.46-8.97)	-0.04 (-0.21-0.13)			
Lebanon	0.708	1183 (1016-1518)	27.80 (23.82-35.74)	1421 (1168-1868)	27.29 (22.42-35.83)	-0.07 (-0.18-0.06)	841 (699-1095)	41.03 (34.1-53.77)	914 (729-1203)	38.92 (30.94-51.44)	-0.05 (-0.2-0.13)	342 (284-441)	15.58 (12.95-20.1)	507 (375-703)	17.75 (13.08-24.52)	0.14 (-0.14-0.39)			
Malaysia	0.737	3915 (3573-4318)	21.33 (19.34-23.57)	5165 (3997-6561)	19.78 (15.37-25.12)	0.03 (-0.16-0.25)	2743 (2494-3026)	30.05 (27.12-33.41)	3642 (2793-4631)	28.00 (21.62-35.55)	-0.07 (-0.28-0.18)	1173 (1058-1301)	12.86 (11.53-14.41)	1523 (1163-1934)	11.70 (8.98-14.81)	-0.09 (-0.29-0.14)			
Oman	0.783	119 (109-131)	11.97 (10.89-13.07)	147 (117-192)	9.86 (8.16-11.94)	0.14 (-0.1-0.41)	88 (79-98)	16.17 (14.56-17.97)	102 (76-145)	12.86 (10.25-16.55)	-0.21 (-0.37-0.04)	31 (27-36)	6.96 (6.02-7.98)	45 (33-54)	6.72 (5.08-8.06)	-0.03 (-0.26-0.17)			
Sri Lanka	0.69	1963 (1848-2087)	10.10 (9.5-10.73)	2507 (1822-3414)	9.71 (7.08-13.11)	-0.04 (-0.29-0.3)	1446 (1338-1549)	16.37 (15.11-17.54)	1731 (1203-2446)	15.00 (10.53-20.91)	-0.08 (-0.34-0.29)	517 (472-567)	4.97 (4.56-5.46)	775 (571-1026)	5.51 (4.06-7.27)	0.11 (-0.19-0.44)			
Turkey	0.748	23 266 (20 540-26 279)	34.31 (30.29-38.64)	29 511 (23 370-36 799)	33.08 (26.25-41.11)	-0.04 (-0.25-0.25)	19 710 (17 304-22 401)	61.72 (54.28-70.08)	24 326 (19 210-30 440)	57.70 (45.57-72.04)	-0.07 (-0.28-0.22)	3556 (3128-4031)	9.96 (8.77-11.28)	5185 (4127-6459)	11.13 (8.87-13.83)	0.12 (-0.13-0.43)			
Middle SDI																			
Armenia	0.689	1316 (1260-1376)	35.13 (33.69-36.69)	1346 (1130-1596)	31.80 (26.74-37.68)	-0.09 (-0.24-0.07)	1085 (1035-1141)	67.75 (64.76-71.21)	1105 (925-1317)	60.67 (50.99-72.07)	-0.10 (-0.25-0.06)	231 (216-246)	10.73 (10.07-11.45)	241 (201-285)	10.22 (8.49-12.07)	-0.05 (-0.22-0.14)			
Azerbaijan	0.683	1748 (1484-1986)	23.41 (19.89-26.53)	2375 (1746-3042)	23.47 (17.37-29.48)	0.00 (-0.19-0.23)	1404 (1145-1636)	41.30 (33.91-48.1)	1922 (1298-2561)	41.36 (28.35-54.1)	0.00 (-0.23-0.28)	344 (298-401)	8.69 (7.43-10.1)	454 (350-577)	8.92 (6.97-11.37)	0.03 (-0.18-0.29)			
China	0.686	610 140 (557 957-666 933)	41.51 (38-45.26)	832 922 (700 293-981 632)	41.71 (35.22-48.8)	0.00 (-0.17-0.2)	430 691 (481 118)	62.27 (55.7-69.25)	576 186 (451 396-709 265)	61.74 (48.93-75.2)	-0.01 (-0.22-0.25)	179 449 (159 280-199 243)	23.73 (21.12-26.3)	256 736 (205 684-314 159)	24.76 (19.89-30.26)	0.04 (-0.17-0.3)			
Indonesia	0.66	34 906 (27 783-40 662)	21.37 (17.15-24.9)	48 199 (35 266-59 309)	22.87 (16.78-28.04)	0.07 (-0.12-0.28)	24 046 (19 581-29 530)	31.51 (26.13-37.98)	32 897 (24 544-43 307)	33.24 (25.13-42.84)	0.05 (-0.18-0.33)	10 860 (6739-15 321)	12.55 (7.83-17.48)	15 302 (8548-22 850)	13.85 (7.74-20.59)	0.10 (-0.14-0.39)			
Iran (Islamic Republic of)	0.67	5621 (5345-5896)	10.72 (10.12-11.25)	8705 (8040-9366)	12.24 (11.26-13.16)	0.14 (0.07-0.22)	4043 (3833-4244)	15.36 (14.51-16.12)	5878 (5357-6411)	16.58 (15.1-18.09)	0.08 (0-0.17)	1578 (1486-1666)	5.98 (5.59-6.33)	2827 (2548-3081)	7.94 (7.13-8.68)	0.33 (0.19-0.45)			
Iraq	0.671	2395 (1875-2958)	15.50 (12.28-18.91)	4154 (3200-5129)	18.69 (14.53-22.68)	0.21 (0-0.46)	1808 (1380-2283)	24.40 (18.91-30.38)	2997 (2290-3678)	28.37 (21.98-34.02)	0.16 (-0.05-0.45)	587 (447-756)	7.15 (5.5-9.09)	1157 (880-1475)	9.79 (7.53-12.32)	0.37 (0.08-0.76)			
Philippines	0.623	9978 (9081-11 179)	17.35 (15.83-19.4)	13 827 (11 026-17 100)	17.71 (14.24-21.75)	0.17 (-0.03-0.38)	7244 (6420-8373)	27.40 (24.42-31.58)	9522 (7205-12 395)	26.62 (20.36-34.23)	-0.03 (-0.29-0.27)	2734 (2428-3108)	8.93 (7.96-10.1)	4305 (3199-5617)	10.38 (7.79-13.4)	0.16 (-0.15-0.56)			
Syrian Arab Republic	0.619	1167 (954-1400)	11.71 (9.68-13.97)	1372 (1007-1814)	11.09 (8.24-14.52)	-0.05 (-0.28-0.22)	873 (702-1070)	16.49 (13.34-20.1)	991 (720-1313)	15.37 (11.3-20.13)	-0.07 (-0.31-0.23)	294 (239-354)	6.40 (5.28-7.58)	382 (262-519)	6.61 (4.56-8.78)	0.03 (-0.26-0.36)			

(Continues)

TABLE 4 (Continued)

Location	SDI 2019 lower	Both						Male						Female					
		2010		2019		2010		2019		2010		2019		2010		2019			
		Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)			
Thailand	0.687	17 710 (15 447– 19 944)	24.56 (21.44–27.57)	22.545 (17 018– 29 560)	–0.09 (–0.33–0.2)	11 686 (9968–13 420)	35.60 (30.55–40.69)	14 701 (10 810– 19 418)	31.98 (23.67–42.06)	–0.10 (–0.34–0.23)	6023 (5229–6868)	15.44 (13.37–17.66)	7845 (5967–10 297)	14.17 (10.77–18.62)	–0.08 (–0.33–0.22)				
Turkmenistan	0.67	262 (248–276)	8.51 (8.04–8.97)	413 (326–521)	0.16 (–0.08–0.46)	197 (184–209)	14.51 (13.58–15.43)	311 (242–395)	16.65 (13.16–20.87)	0.15 (–0.1–0.44)	66 (59–72)	3.86 (3.49–4.27)	102 (79–130)	4.57 (3.56–5.83)	0.19 (–0.06–0.48)				
Uzbekistan	0.631	1825 (1741–1915)	11.77 (11.25–12.31)	2771 (2282–3324)	0.08 (–0.1–0.27)	1333 (1253–1414)	19.63 (18.57–20.78)	1992 (1620–2421)	20.46 (17.03–24.28)	0.04 (–0.14–0.24)	493 (464–523)	5.81 (5.47–6.2)	779 (638–942)	6.73 (5.58–7.99)	0.16 (–0.04–0.39)				
Vietnam	0.617	17 235 (15 159– 19 723)	24.83 (22.04–28.24)	25 550 (19 741– 32 387)	0.08 (–0.13–0.3)	12 590 (11 087– 14 260)	42.65 (38.09–47.93)	18 528 (14 064– 23 736)	44.80 (34.83–56.18)	0.05 (–0.15–0.28)	4645 (3843–5618)	11.81 (9.79–14.37)	7022 (5269–9137)	13.29 (9.98–17.24)	0.13 (–0.12–0.41)				
Low-middle SDI																			
Bangladesh	0.483	6566 (4863–8976)	7.64 (5.7–10.28)	9652 (6331–15 120)	–0.03 (–0.28–0.27)	5397 (3987–7425)	11.69 (8.74–15.83)	7502 (4817–12 048)	11.08 (7.15–17.71)	–0.05 (–0.33–0.26)	1169 (801–1657)	2.90 (1.97–4.14)	2150 (1422–3064)	3.43 (2.26–4.91)	0.18 (–0.09–0.49)				
Bhutan	0.455	32 (24–41)	7.24 (5.44–9.48)	43 (31–58)	0.07 (–0.11–0.28)	24 (16–32)	10.64 (7.04–14.45)	31 (20–44)	11.08 (7.06–15.83)	0.04 (–0.14–0.25)	8 (5–13)	3.61 (2.36–6.02)	12 (8–18)	4.25 (2.88–6.69)	0.18 (–0.04–0.47)				
Cambodia	0.469	1943 (1615–2410)	23.27 (19.41–29.44)	2888 (2267–3576)	0.06 (–0.12–0.26)	1444 (1172–1852)	42.72 (34.7–55.69)	2091 (1607–2668)	44.38 (34.42–57.78)	0.04 (–0.14–0.24)	499 (408–613)	10.00 (8.27–12.25)	796 (609–1018)	11.58 (8.95–14.76)	0.16 (–0.06–0.41)				
Democratic People's Republic of Korea	0.558	7716 (5937–9904)	28.48 (22.28–36.22)	9042 (7008–11 461)	–0.02 (–0.17–0.14)	5232 (3767–7144)	27.88 (21.77–35.2)	6058 (4408–8117)	45.66 (33.78–59.94)	–0.07 (–0.21–0.1)	2484 (1904–3102)	15.64 (12.08–19.45)	2984 (2144–3880)	15.88 (11.37–20.73)	0.02 (–0.19–0.24)				
India	0.566	58 555 (53 880– 63 454)	6.95 (6.38–7.52)	87 339 (71 865– 103 504)	0.11 (–0.09–0.31)	44 441 (40 224– 48 717)	7.70 (6.36–9.1)	61 253 (48 085– 75 929)	11.16 (8.8–13.74)	0.03 (–0.19–0.27)	14 113 (12 387– 15 766)	3.30 (2.88–3.7)	26 086 (20 315– 32 542)	4.49 (3.51–5.59)	0.36 (0.06–0.71)				
Kyrgyzstan	0.596	464 (444–483)	13.08 (12.5–13.63)	569 (493–647)	0.01 (–0.19–0.27)	358 (340–374)	12.20 (10.62–13.86)	430 (371–492)	23.41 (22.28–24.5)	–0.09 (–0.21–0.04)	106 (99–113)	5.22 (4.85–5.59)	139 (115–164)	5.37 (4.47–6.31)	0.03 (–0.14–0.21)				
Lao People's Democratic Republic	0.49	714 (549–920)	22.07 (17.04–28.22)	973 (718–1264)	0.01 (–0.17–0.22)	539 (402–723)	22.78 (17.04–29.01)	713 (519–923)	35.53 (26.79–47.27)	–0.01 (–0.2–0.22)	174 (134–247)	10.05 (7.83–14.21)	260 (186–372)	11.45 (8.37–16.54)	0.14 (–0.09–0.41)				
Maldives	0.562	18 (16–20)	9.88 (8.82–11.02)	26 (22–32)	–0.02 (–0.17–0.14)	14 (12–16)	9.58 (7.88–11.42)	20 (17–24)	14.24 (12.47–16.19)	–0.04 (–0.22–0.18)	4 (3–4)	4.54 (3.88–5.24)	6 (5–8)	4.83 (3.86–5.91)	0.06 (–0.14–0.31)				
Mongolia	0.606	436 (360–520)	30.80 (25.83–36.06)	662 (512–863)	–0.07 (–0.27–0.16)	342 (280–412)	31.19 (24.67–39.68)	521 (391–686)	56.92 (47.51–67.06)	0.02 (–0.21–0.29)	94 (77–115)	12.49 (10.34–15.05)	141 (109–182)	12.53 (9.93–15.84)	0.00 (–0.22–0.28)				

TABLE 4 (Continued)

Location	SDI 2019 lower	Both						Male						Female					
		2010		2019		% change 2010-2019		2010		2019		% change 2010-2019		2010		2019		% change 2010-2019	
		Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)
Myanmar	0.521	7977	22.49	10 291	22.43	-0.03	5560	35.70	6983	35.42	-0.01	2417	12.20	3308	12.78	0.05			
		(5874-11 118)	(16.61-31.11)	(7608-14 071)	(16.85-30.17)	(-0.2-0.17)	(3740-8705)	(24.28-55.37)	(4957-10 306)	(25.24-51.86)	(-0.2-0.23)	(1893-3145)	(9.51-16.02)	(2559-4360)	(9.87-16.75)	(-0.13-0.27)			
Palestine	0.588	318	19.25	523	22.53	-0.05	252	34.39	410	38.02	0.11	66	7.17	113	9.15	0.27			
		(288-348)	(17.43-21.05)	(444-613)	(19.09-26.1)	(-0.28-0.27)	(226-280)	(30.8-38.2)	(349-478)	(32.52-43.98)	(-0.09-0.32)	(59-76)	(6.29-8.2)	(92-137)	(7.46-10.99)	(0.01-0.59)			
Tajikistan	0.539	481	12.86	593	11.98	-0.07	355	19.54	411	17.78	-0.09	125	6.50	182	6.80	0.05			
		(415-555)	(11.02-14.91)	(479-740)	(9.76-14.83)	(-0.27-0.17)	(300-416)	(16.35-22.98)	(323-527)	(14.3-22.37)	(-0.29-0.16)	(108-145)	(5.59-7.55)	(146-229)	(5.48-8.49)	(-0.18-0.32)			
Timor-Leste	0.514	108	17.36	158	19.48	0.12	79	25.16	113	28.08	0.12	30	9.47	46	11.12	0.17			
		(77-142)	(12.32-22.53)	(113-207)	(13.86-25.27)	(-0.12-0.39)	(52-105)	(16.6-33.1)	(75-148)	(18.7-36.55)	(-0.13-0.41)	(22-47)	(7.2-15.05)	(32-66)	(7.93-15.99)	(-0.11-0.49)			
Low SDI																			
Afghanistan	0.343	1102	11.67	1476	11.74	0.01	873	19.77	1111	19.22	-0.03	229	4.29	365	5.10	0.19			
		(622-1880)	(6.83-19.97)	(871-2335)	(7.33-18.53)	(-0.17-0.27)	(458-1626)	(10.56-36.59)	(618-1928)	(11.28-33.01)	(-0.2-0.24)	(158-330)	(3.13-6.1)	(237-524)	(3.62-7.06)	(-0.08-0.53)			
Nepal	0.422	1176	7.04	1759	8.03	0.00	839	10.15	1202	11.51	0.13	337	3.97	557	4.84	0.22			
		(862-1552)	(5.13-9.3)	(1263-2275)	(5.86-10.37)	(-0.18-0.22)	(619-1110)	(7.53-13.39)	(873-1535)	(8.4-14.59)	(-0.12-0.39)	(212-508)	(2.46-6.09)	(371-803)	(3.22-7.03)	(-0.04-0.57)			
Pakistan	0.449	14 621	17.38	18 401	16.43	-0.18	12 630	28.75	15 424	26.67	-0.07	1991	4.94	2978	5.50	0.11			
		(11 540-18 092)	(13.79-21.4)	(13 970-24 265)	(12.47-21.49)	(-0.32-0.02)	(9607-16 079)	(22.1-36.25)	(11 224-21 011)	(19.52-36.05)	(-0.34-0.29)	(1564-2433)	(3.86-6)	(2160-3927)	(4.05-7.16)	(-0.17-0.5)			
Yemen	0.412	952	10.13	1302	9.95	-0.02	766	16.44	1014	15.94	-0.03	186	3.83	289	4.15	0.09			
		(684-1373)	(7.29-14.61)	(885-1930)	(6.8-14.67)	(-0.21-0.21)	(532-1136)	(11.48-24.16)	(658-1601)	(10.39-24.91)	(-0.24-0.21)	(141-250)	(2.9-5.03)	(212-391)	(3.11-5.57)	(-0.21-0.36)			

Abbreviations: CI, confidence interval; SDI, sociodemographic index; TBL, tracheal, bronchial and lung.

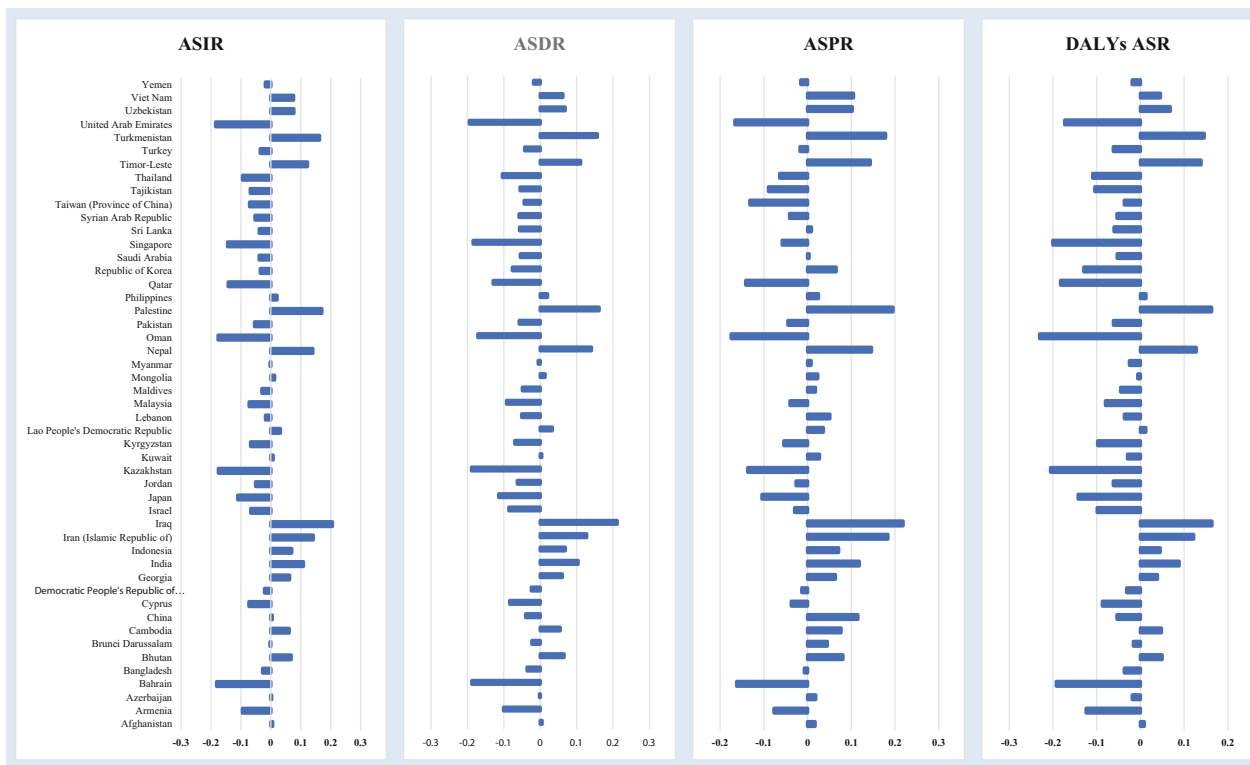


FIGURE 4 The relative change (%) in age-standardized incidence rate (ASIR), age-standardized death rate (ASMR), age-standardized DALYs rate (DALYs ASR), and age-standardized prevalence rate (ASPR) of TBL cancer in Asian countries from 1990 to 2019.

43.79) per 100 000 in 2019, while in the same time, this rate globally decreased by 9%, in America by 12% and in Europe by 13% (Table 2).

In Asian women, the number of TBL cancer deaths increased from 260 550 (95% CI: 238 233–282 526) in 2010 to 364 778 (95% CI: 312 089–421 085) in 2019, which is over a 1.4-fold increase. In 2019 approximately 30.6% of Asian TBL cancer deaths occurred in Asian women which included 55.6% (364 778 /656 546) of global female TBL cancer incidence cases. During this period, the age-standardized incidence rate (ASIR) of TBL cancer with a 2% change, increased from 14.67 (95% CI: 13.35–15.92) per 100 000 in 2010 to 14.98 (95% CI: 12.81–17.27) per 100 000 in 2019, while in the same time, this rate globally experienced no changes, in Africa increased by 12%, and in Europe by 2%; while in American countries decreased by 8% (Table 3).

Age distribution

In 2019, age-specific death cases of TBL cancer were peaking at 70–74 years generally, in males, and females. In all age groups, death cases of TBL cancer in males were higher than in females, except in ages above 90 years which in females was higher (Figure 5).

Within Asian regions

In 2019, the highest ASDR of TBL was observed in East Asian countries (38.38 [95% CI: 32.72–44.57]); with a 4% decrease compared with 2010. While the Central Asia and high-income Asia Pacific countries experienced a decreasing trend of 7% and 11%, respectively; the South Asian countries experienced the highest increasing trend from 2010 to 2019 (by 6%) (Figure 3 and Table 1).

In men, the highest ASDR of TBL was observed in East Asia countries (57.5 [95% CI: 46.25–69.74]); with a 5% decrease compared with 2010. While Central Asia, High-income Asia Pacific, North Africa and Middle East countries experienced a decreasing trend of 9, 15, and 3%, respectively; the South Asian and Southeast Asian countries experienced a stable trend from 2010 to 2019 (Table 2).

In women, the highest ASDR of TBL was observed in Southeast Asian countries (13.36 [95% CI: 10.19–16.57]) in 2019; other countries experienced an increasing trend from 2010 to 2019, except high-income Asia Pacific countries who experienced a decreasing trend by 3% from 2010 to 2019 and East Asia experienced a stable trend. Other countries experienced an increasing trend from 2% to 31%. South Asian countries experienced the highest increasing trend from 2010 to 2019 (by 31%) (Table 3).

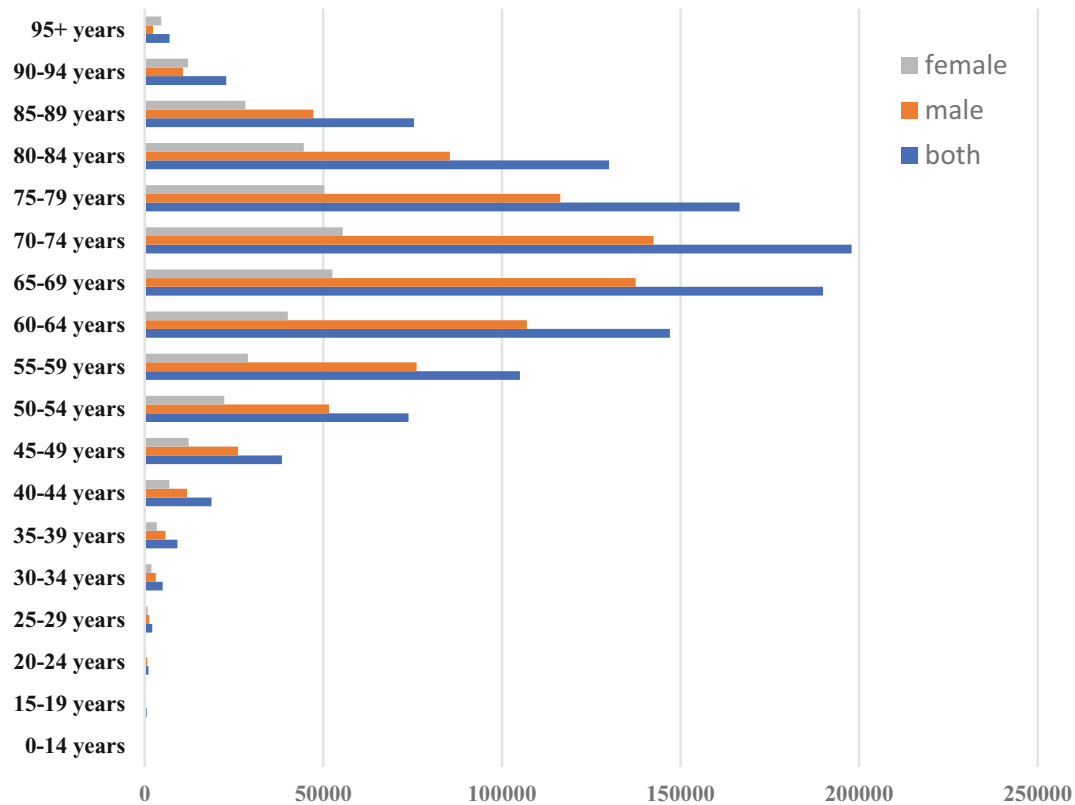


FIGURE 5 Age specific death cases of TBL cancer among sexes in Asia, 2019.

Based on SDI

Among high SDI Asian countries, Brunei Darussalam (44.83) and Taiwan (Province of China) (30.35) had the highest ASDR of TBL, and Saudi Arabia (9.14) had the lowest rate. Among high-middle SDI Asian countries, Turkey (33.77) and Georgia (30.57) had the highest ASDR of TBL, and Sri Lanka (9.78) had the lowest rate. Among middle SDI Asian countries, China (38.70) and Armenia (31.62) had the highest ASIR of TBL, and Turkmenistan (9.86) had the lowest rate. Among low-middle SDI Asian countries, Mongolia (33.35) and the Democratic People's Republic of Korea (28.54) had the highest ASDR of TBL, and Bangladesh (7.81) had the lowest rate. Among low SDI Asian countries, Pakistan (17.16) had the highest ASDR of TBL, and Nepal (8.62) had the lowest rate. Further details are presented in Table 5.

National comparison

Among Asian countries, 31 countries experienced a decreasing trend in the TBL cancer mortality rate between 2010 and 2019; the greatest increase was detected in Iraq (increase in ASDR = 0.21 [95% CI: 0.01–0.45]) and the greatest decrease was detected in the United Arab Emirates (decrease in ASDR = -0.18 [95% CI: -0.38–0.06]) (Figure 4).

In 2019, the highest ASDR (per 100 000) of TBL cancer was reported in Brunei Darussalam (44.83), China (38.7), Turkey (33.77), Mongolia (33.35), and Armenia (31.62). The lowest ASDR of TBL cancer was reported in Bangladesh (7.81), India (8.07), Bhutan (8.26), Nepal (8.62), and Saudi Arabia (9.14).

The national distribution of TBL cancer among men was the same as the overall distribution; however, men in Georgia had the second highest ASIR rate (61.47).

The national distribution of TBL cancer among women is different: the highest ASDR (per 100 000) of TBL cancer was reported in Brunei Darussalam (36.09), China (22.86), Taiwan (Province of China) (21.16), Lebanon (16.51), and Democratic People's Republic of Korea (16.34). The lowest ASDR (per 100 000) of TBL cancer was reported in Bangladesh (3.62), Yemen (4.34), Bhutan (4.5), Turkmenistan (4.55), and India (4.7). Detailed results are presented in Table 5.

Prevalence of TBL cancer in Asia

Compared with global data and continents

In Asia, the number of cases who lived with TBL cancer increased from 1 308 776 (95% CI: 1 225 459–1 392 332) in 2010 to 1 820 539 (95% CI: 1 605 530–2 034 496) in 2019, which is a 1.4-fold increase. In 2019 approximately 57%

TABLE 5 The death distribution of TBL cancer in Asian countries in 2010 and 2019 and the temporal trends between 2010 and 2019, by geographical region and SDI.

Location	SDI 2019	Both				Male				Female						
		2010		2019		2010		2019		2010		2019				
		Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)			
High SDI																
Brunei	0.823	69	45.89	103	44.83	-0.02	39	60.935874	57	61.11	0.00	30	35.25	47	5.76	0.02
Danussalam		(63-76)	(41.83-49.96)	(92-116)	(39.66-50.19)	(-0.14-0.11)	(35-44)	(53.69-68.48)	(47-67)	(51.96-71.14)	(-0.16-0.18)	(27-33)	(31.44-39.05)	(40-54)	(4.23-7.59)	(-0.13-0.2)
Cyprus	0.841	362	25.56	462	23.42	-0.08	283	44.832451	358	38.37	-0.14	79	10.36	104	11.76	-0.01
		(340-385)	(24-27.22)	(404-525)	(20.52-26.63)	(-0.21-0.05)	(264-305)	(41.76-48.26)	(309-412)	(33.08-44.39)	(-0.27-0)	(71-87)	(9.4-11.38)	(88-121)	(8.38-16.83)	(-0.17-0.13)
Israel	0.803	2084	23.74	2518	21.69	-0.09	1391	35.486246	1651	31.35	-0.12	692	14.02	867	13.53	-0.04
		(1963-2166)	(22.44-24.64)	(2314-2684)	(20.04-23.1)	(-0.14-0.03)	(1320-1451)	(33.69-37)	(1526-1769)	(29.01-33.63)	(-0.17-0.05)	(633-735)	(12.95-14.82)	(769-953)	(10.5-17.71)	(-0.12-0.04)
Japan	0.87	77 446	23.94	86 001	21.21	-0.11	55 542	41.086896	59 128	34.43	-0.16	21 904	11.34	26 873	13.46	-0.04
		(68 445-82 060)	(21.57-25.15)	(73 379-92 677)	(18.86-22.52)	(-0.14-0.09)	(50 829-57 902)	(37.63-42.84)	(52 951-62 882)	(31.29-36.42)	(-0.19-0.14)	(17 457-24 307)	(9.57-12.3)	(20 579-30 319)	(10.15-17.38)	(-0.07-0)
Kuwait	0.851	133	10.71	228	10.75	0.00	104	13.622346	181	14.51	0.07	29	5.86	47	7.64	-0.15
		(123-142)	(9.82-11.46)	(185-275)	(8.72-12.98)	(-0.18-0.21)	(95-112)	(12.47-14.67)	(140-225)	(11.28-18.13)	(-0.16-0.34)	(26-32)	(5.19-6.45)	(37-59)	(6.43-8.89)	(-0.32-0.04)
Qatar	0.83	66	23.82	119	20.74	-0.13	56	28.944687	101	23.78	-0.18	10	12.55	18	6.89	-0.06
		(53-81)	(19.57-28.75)	(85-165)	(16-26.07)	(-0.32-0.11)	(44-71)	(23.08-35.69)	(70-144)	(18.07-30.42)	(-0.39-0.1)	(8-12)	(10.07-15.24)	(14-23)	(5.75-8.14)	(-0.24-0.16)
Republic of Korea	0.878	17 173	28.48	23 300	26.30	-0.08	12 516	51.709606	16 614	44.73	-0.13	4658	13.36	6686	5.07	-0.02
		(16 151-18 288)	(26.55-30.46)	(20 864-25 565)	(23.51-28.95)	(-0.15-0)	(11 907-13 376)	(48.53-55.26)	(14 800-18 406)	(39.53-49.69)	(-0.22-0.04)	(4138-5002)	(11.84-14.43)	(5681-7580)	(4.04-6.2)	(-0.12-0.09)
Saudi Arabia	0.805	1026	9.67	1492	9.14	-0.05	779	13.087167	1110	11.67	-0.11	247	5.16	382	16.51	0.03
		(911-1186)	(8.74-10.97)	(1146-1830)	(7.33-11.06)	(-0.23-0.13)	(692-914)	(11.82-15.09)	(842-1380)	(9.15-14.5)	(-0.29-0.1)	(215-283)	(4.51-5.86)	(286-493)	(12.14-22.82)	(-0.21-0.29)
Singapore	0.861	1180	25.62	1566	20.89	-0.18	779	38.33246	1010	29.36	-0.23	401	15.82	556	12.13	-0.12
		(1106-1228)	(23.72-26.8)	(1414-1682)	(18.7-22.48)	(-0.24-0.13)	(736-812)	(35.88-40.11)	(915-1087)	(26.4-31.74)	(-0.3-0.18)	(363-430)	(14.22-16.98)	(476-621)	(9.35-15.37)	(-0.21-0.03)
Taiwan (Province of China)	0.868	9477	31.76	12 053	30.35	-0.04	6275	43.334223	7526	41.31	-0.05	3201	20.89	4527	5.15	0.01
		(8860-9886)	(29.66-33.13)	(9527-15 345)	(24.07-38.58)	(-0.24-0.21)	(5890-6556)	(40.7-45.28)	(5915-9577)	(32.49-52.51)	(-0.25-0.21)	(2911-3386)	(18.96-22.13)	(3521-5766)	(3.38-7.58)	(-0.2-0.29)
United Arab Emirates	0.88	221	25.27	523	20.35	-0.19	172	28.051538	423	23.74	-0.15	49	20.31	100	13.55	-0.33
		(177-267)	(20.93-29.73)	(380-697)	(14.71-28.22)	(-0.38-0.06)	(136-211)	(22.57-34.14)	(303-580)	(17.44-32.88)	(-0.33-0.09)	(38-60)	(16.3-24.84)	(66-135)	(7.93-20.63)	(-0.6-0.08)
High-middle SDI																
Bahrain	0.751	86	27.19	142	22.08	-0.19	64	39.55	106	30.42	-0.23	22	15.08	35	10.91	-0.14
		(76-97)	(24-30.54)	(107-187)	(17.07-27.74)	(-0.36-0.01)	(55-74)	(34.23-45.28)	(78-144)	(22.96-39.13)	(-0.41-0)	(19-26)	(13.06-17.35)	(28-43)	(9.02-12)	(-0.3-0.04)
Georgia	0.702	1659	28.83	1770	30.57	0.06	1392	57.63	1496	61.47	0.07	267	7.74	274	12.19	0.03
		(1512-1806)	(26.19-31.44)	(1485-2080)	(25.58-36.05)	(-0.13-0.28)	(1248-1533)	(51.79-63.61)	(1241-1764)	(51.26-72.48)	(-0.13-0.29)	(242-293)	(7.01-8.52)	(230-329)	(9.55-15.44)	(-0.17-0.25)
Jordan	0.731	492	16.12	917	15.11	-0.06	394	24.90	711	22.35	-0.10	98	6.54	206	7.21	0.10
		(487-554)	(14.4-18.16)	(749-1110)	(12.47-18.25)	(-0.24-0.14)	(347-451)	(21.91-28.36)	(551-897)	(17.53-27.92)	(-0.3-0.13)	(84-113)	(5.61-7.63)	(163-261)	(5.7-9.09)	(-0.12-0.4)
Kazakhstan	0.723	3707	26.06	3717	21.14	-0.19	3023	53.60	2949	41.77	-0.22	684	8.18	768	9.16	-0.07
		(3528-3903)	(24.81-27.42)	(3184-4261)	(18.19-24.13)	(-0.31-0.06)	(2849-3222)	(50.5-56.9)	(2501-3441)	(35.55-48.3)	(-0.34-0.09)	(644-724)	(7.72-8.65)	(646-894)	(7.1-11.7)	(-0.22-0.1)

TABLE 5 (Continued)

Location	Both				Male				Female							
	2010		2019		2010		2019		2010		2019					
	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)				
Lebanon	0.708	1233 (1055-1587)	28.99 (24.77-37.45)	1433 (1184-1898)	27.51 (22.67-36.43)	-0.05 (-0.19-0.1)	901 (750-1179)	43.86 (36.6-57.8)	961 (768-1281)	40.95 (32.73-54.66)	-0.07 (-0.21-0.11)	332 (278-431)	15.21 (12.73-19.7)	472 (347-656)	13.69 (10.94-17.28)	0.09 (-0.17-0.3)
Malaysia	0.737	3987 (3634-4394)	22.70 (20.65-25.05)	5221 (4060-6639)	20.60 (16.01-25.95)	-0.09 (-0.29-0.13)	2788 (2532-3082)	32.03 (28.86-35.47)	3689 (2834-4679)	29.23 (22.62-37.18)	-0.09 (-0.29-0.15)	1199 (1085-1335)	13.73 (12.35-15.43)	1532 (1177-1946)	12.07 (8.92-17.44)	-0.12 (-0.31-0.1)
Oman	0.783	120 (109-131)	12.61 (11.49-13.75)	144 (115-187)	10.45 (8.67-12.59)	-0.17 (-0.31-0.02)	90 (81-100)	17.49 (15.76-19.37)	103 (77-143)	14.17 (11.41-18.04)	-0.19 (-0.36-0.04)	30 (26-34)	6.91 (5.96-7.91)	42 (30-50)	13.13 (11.21-14.86)	-0.04 (-0.26-0.15)
Sri Lanka	0.69	1958 (1845-2082)	10.37 (9.75-11.02)	2478 (1804-3369)	9.78 (7.17-13.16)	-0.06 (-0.3-0.26)	1438 (1329-1540)	16.86 (15.56-18.17)	1704 (1181-2405)	15.17 (10.71-20.97)	-0.10 (-0.36-0.25)	520 (475-570)	5.14 (4.7-5.64)	774 (570-1018)	11.80 (9.31-14.65)	0.08 (-0.2-0.4)
Turkey	0.748	23 677 (20 919-26 663)	35.27 (31.17-39.67)	29 832 (23 752-37 028)	33.77 (26.89-41.8)	-0.04 (-0.25-0.23)	20 121 (17 682-22 813)	64.00 (56.28-72.42)	24 781 (19 591-30 951)	59.69 (47.29-74.06)	-0.07 (-0.28-0.21)	3556 (3109-4051)	10.04 (8.77-11.45)	5051 (4027-6271)	6.60 (4.98-7.96)	0.09 (-0.15-0.39)
Middle SDI																
Armenia	0.689	1318 (1259-1380)	35.17 (33.7-36.83)	1334 (1122-1578)	31.62 (26.67-37.28)	-0.10 (-0.24-0.06)	1084 (1035-1140)	68.17 (65.21-71.66)	1091 (916-1296)	60.65 (51.04-71.69)	-0.11 (-0.25-0.05)	234 (219-249)	10.84 (10.16-11.57)	243 (202-285)	13.41 (11.96-14.7)	-0.06 (-0.22-0.12)
Azerbaijan	0.683	1718 (1462-1949)	23.64 (20.17-26.79)	2296 (1687-2921)	23.58 (17.54-29.65)	0.00 (-0.19-0.22)	1376 (1123-1599)	41.67 (34.32-48.26)	1852 (1253-2449)	41.55 (28.54-53.95)	0.00 (-0.23-0.27)	342 (295-398)	8.96 (7.6-10.43)	444 (346-567)	5.58 (4.12-7.34)	0.02 (-0.18-0.27)
China	0.686	576 914 (525 378-627 888)	40.32 (36.72-43.74)	757 171 (638 741-887 752)	38.70 (32.8-45.03)	-0.04 (-0.2-0.14)	407 013 (364 221-453 597)	61.44 (55.4-67.89)	523 192 (413 189-647 410)	58.10 (46.53-70.89)	-0.05 (-0.25-0.18)	169 901 (151 510-187 913)	22.95 (20.52-25.38)	233 980 (189 176-282 754)	13.86 (11.9-15.47)	0.00 (-0.21-0.23)
Indonesia	0.66	35 895 (29 166-41 844)	22.85 (18.64-26.48)	49 437 (36 066-61 105)	24.43 (17.87-30.22)	0.07 (-0.12-0.25)	24 808 (20 169-30 290)	34.01 (28.07-40.5)	33 792 (24 844-44 220)	35.81 (27.13-45.72)	0.05 (-0.18-0.34)	11 086 (8893-15 503)	13.29 (8.37-18.31)	15 645 (8696-23 612)	3.62 (2.36-5.2)	0.11 (-0.13-0.37)
Iran (Islamic Republic of)	0.67	5820 (5524-6094)	11.43 (10.75-11.99)	8923 (8247-9595)	12.88 (11.86-13.89)	0.13 (0.06-0.21)	4251 (4013-4451)	16.54 (15.54-17.35)	6155 (5636-6725)	17.78 (16.23-19.41)	0.07 (0-0.16)	1569 (1478-1653)	6.19 (5.77-6.54)	2768 (2488-3018)	10.93 (8.44-13.91)	0.30 (0.16-0.42)
Iraq	0.671	2439 (1919-2991)	16.40 (13.04-19.86)	4232 (3275-5190)	19.86 (15.62-23.82)	0.21 (0.01-0.46)	1862 (1430-2338)	26.22 (20.5-32.43)	3106 (2375-3782)	30.87 (24.16-36.78)	0.18 (-0.03-0.46)	577 (441-738)	7.29 (5.65-9.2)	1125 (861-1428)	16.34 (11.79-21.14)	0.36 (0.08-0.74)
Philippines	0.623	10 071 (9171-11 304)	18.10 (16.52-20.33)	13 964 (11 342-17 103)	18.47 (15.13-22.39)	0.02 (-0.18-0.24)	7292 (6473-8370)	28.64 (25.5-32.82)	9574 (7259-12 342)	27.81 (21.32-35.44)	-0.03 (-0.26-0.25)	2779 (2482-3134)	9.40 (8.4-10.6)	4391 (3359-5627)	36.09 (30.48-41.95)	0.16 (-0.13-0.53)
Syrian Arab Republic	0.619	1163 (951-1394)	12.34 (10.22-14.66)	1374 (1011-1813)	11.62 (8.7-15.09)	-0.06 (-0.28-0.2)	883 (713-1080)	17.36 (14.13-21.12)	1007 (735-1330)	16.16 (11.92-21.03)	-0.07 (-0.31-0.22)	280 (229-337)	6.69 (5.52-7.91)	368 (251-496)	5.33 (3.89-7.3)	0.02 (-0.26-0.33)
Thailand	0.687	18 077 (15 773-20 299)	25.63 (22.28-28.73)	23 109 (17 523-30 148)	22.96 (17.39-29.79)	-0.10 (-0.33-0.18)	11 877 (10 169-13 616)	37.26 (31.81-42.52)	14 984 (11 049-19 714)	33.14 (24.72-43.49)	-0.11 (-0.35-0.21)	6200 (5362-7096)	16.16 (13.93-18.5)	8125 (6109-10 606)	4.70 (3.69-5.87)	-0.09 (-0.33-0.2)
Turkmenistan	0.67	255 (242-268)	8.52 (8.04-8.99)	399 (316-504)	9.86 (7.82-12.24)	0.16 (-0.08-0.45)	191 (179-203)	14.68 (13.73-15.6)	300 (234-380)	16.74 (13.32-20.9)	0.14 (-0.1-0.43)	64 (58-71)	3.88 (3.5-4.29)	99 (77-126)	9.30 (7.6-11.15)	0.17 (-0.07-0.47)

(Continues)

TABLE 5 (Continued)

Location	Both			Male			Female								
	2010	2019	% change 2010-2019	2010	2019	% change 2010-2019	2010	2019	% change 2010-2019						
	Number (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)						
Uzbekistan	0.631	1777 (1697-1861)	12.10 (11.6-12.67)	2656 (2189-3179)	7.81 (6.03-10.91)	0.07 (-0.1-0.26)	1299 (1220-1375)	1912 (1564-2316)	20.99 (17.52-24.9)	0.03 (-0.15-0.23)	479 (451-508)	744 (612-898)	6.03 (5.07-6.43)	4.34 (3.25-5.81)	0.14 (-0.05-0.37)
Vietnam	0.617	17 351 (15 352-19 780)	25.40 (22.5-28.76)	25 161 (19 494-31 704)	26.98 (21.12-33.59)	0.06 (-0.14-0.28)	12 611 (11 157-14 257)	18 151 (13 927-23 007)	45.80 (35.79-57.02)	0.04 (-0.16-0.25)	4741 (3943-5695)	7010 (5288-9118)	12.13 (10.14-14.62)	5.31 (4.06-6.69)	0.11 (-0.13-0.38)
Low-middle SDI															
Bangladesh	0.483	6743 (5015-9167)	8.11 (6.03-10.91)	9970 (6569-15 550)	7.81 (5.19-12.13)	-0.04 (-0.29-0.26)	5553 (4139-7591)	7765 (5023-12 476)	12.39 (9.3-16.69)	-0.06 (-0.34-0.26)	1190 (810-1679)	2206 (1454-3162)	3.09 (2.07-4.43)	10.23 (8.52-12.03)	0.17 (-0.09-0.46)
Bhutan	0.455	33 (25-43)	7.75 (5.8-10.14)	44 (32-61)	8.26 (5.99-11.35)	0.07 (-0.11-0.27)	25 (17-34)	33 (21-46)	11.44 (7.51-15.45)	0.04 (-0.14-0.25)	8 (5-13)	12 (8-19)	3.84 (2.53-6.37)	8.03 (7.19-8.8)	0.17 (-0.04-0.46)
Cambodia	0.469	2022 (1683-2527)	25.00 (20.87-31.72)	2985 (2340-3699)	26.38 (20.84-32.64)	0.05 (-0.12-0.25)	1511 (1224-1953)	2169 (1672-2792)	46.42 (37.87-61.36)	0.03 (-0.14-0.24)	510 (420-626)	816 (629-1048)	10.54 (8.75-12.92)	9.90 (7.7-12.23)	0.16 (-0.06-0.41)
Democratic Republic of Korea	0.558	7796 (6038-9952)	29.26 (23.13-36.87)	9163 (7158-11 540)	28.54 (22.5-35.77)	-0.02 (-0.16-0.14)	5238 (3795-7105)	6072 (4439-8075)	51.31 (38.38-67.9)	-0.07 (-0.21-0.09)	2558 (1988-3187)	3091 (2235-3985)	16.21 (12.68-20.03)	7.96 (6.61-9.56)	0.01 (-0.19-0.22)
India	0.566	59 637 (55 118-64 928)	7.31 (6.72-7.96)	89 242 (73 675-105 403)	8.07 (6.65-9.49)	0.10 (-0.09-0.3)	45 272 (40 946-50 024)	62 544 (49 134-76 427)	11.38 (10.27-12.56)	0.03 (-0.19-0.27)	14 365 (12 383-16 094)	26 698 (20 990-33 532)	3.47 (2.97-3.93)	22.86 (18.52-27.52)	0.35 (0.04-0.7)
Kyrgyzstan	0.596	463 (443-481)	13.28 (12.7-13.83)	560 (486-636)	12.35 (10.8-14.02)	-0.07 (-0.19-0.05)	354 (337-370)	422 (364-483)	23.76 (22.63-24.86)	-0.09 (-0.21-0.04)	108 (101-116)	139 (115-163)	5.40 (5.03-5.78)	10.21 (8.66-11.83)	0.02 (-0.15-0.2)
Lao People's Democratic Republic	0.49	735 (567-944)	23.51 (18.32-29.96)	1000 (742-1290)	24.28 (18.33-30.73)	0.03 (-0.15-0.25)	558 (418-746)	736 (538-944)	38.21 (29.15-50.58)	-0.01 (-0.19-0.21)	177 (137-251)	264 (191-380)	10.56 (8.33-14.96)	4.55 (3.59-5.73)	0.14 (-0.08-0.41)
Maldives	0.562	19 (17-21)	10.71 (9.55-11.95)	27 (22-32)	10.19 (8.37-12.12)	-0.05 (-0.22-0.14)	15 (13-17)	21 (17-25)	15.42 (13.54-17.52)	-0.05 (-0.23-0.16)	4 (3-5)	6 (5-8)	4.86 (4.14-5.62)	14.71 (8.21-21.61)	0.04 (-0.16-0.3)
Mongolia	0.606	444 (368-528)	32.91 (27.71-38.32)	672 (523-869)	33.35 (26.47-41.97)	0.01 (-0.19-0.25)	346 (284-415)	525 (397-686)	61.58 (51.74-72.13)	0.02 (-0.2-0.28)	98 (81-120)	146 (114-188)	13.68 (11.37-16.36)	14.65 (11.02-19.14)	0.00 (-0.21-0.26)
Myanmar	0.521	8280 (6111-11 662)	23.93 (17.77-33.42)	10 614 (7896-14 368)	23.80 (17.76-31.88)	-0.01 (-0.17-0.22)	5780 (3900-9101)	7195 (5113-10 591)	38.31 (25.96-59.89)	-0.01 (-0.19-0.22)	2500 (1957-3185)	3419 (2644-4499)	12.90 (10.04-16.86)	7.07 (5.71-8.81)	0.05 (-0.13-0.29)
Palestine	0.588	327 (296-357)	20.51 (18.54-22.39)	530 (448-618)	23.83 (20.24-27.6)	0.16 (-0.04-0.38)	261 (234-289)	420 (358-487)	37.39 (33.48-41.42)	0.10 (-0.09-0.31)	66 (58-75)	110 (90-133)	7.40 (6.48-8.45)	5.50 (4.59-6.45)	0.26 (-0.01-0.57)
Tajikistan	0.539	480 (414-554)	13.31 (11.39-15.41)	586 (476-732)	12.57 (10.27-15.51)	-0.06 (-0.25-0.19)	355 (300-416)	408 (322-522)	20.32 (16.96-23.89)	-0.07 (-0.28-0.18)	124 (108-145)	178 (143-224)	6.72 (5.76-7.81)	4.96 (3.95-6.14)	0.05 (-0.17-0.32)
Timor-Leste	0.514	113 (80-148)	18.81 (13.31-24.46)	165 (116-216)	20.90 (14.99-27.09)	0.11 (-0.12-0.37)	82 (54-110)	118 (78-154)	27.40 (18.17-35.66)	0.11 (-0.14-0.39)	31 (23-49)	47 (33-67)	10.08 (7.75-16.04)	6.82 (4.76-8.95)	0.17 (-0.11-0.47)

TABLE 5 (Continued)

Location	SDI 2019	Both			Male			Female								
		2019			2010			2019			2010					
		Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)			
Low SDI																
Afghanistan	0.343	1136 (652-1939)	12.46 (7.48-21.27)	1492 (892-2356)	12.53 (7.99-19.7)	0.01 (-0.17-0.27)	908 (482-1679)	21.10 (11.52-38.64)	1133 (641-1954)	20.59 (12.25-34.99)	-0.02 (-0.19-0.24)	228 (160-326)	4.48 (3.3-6.35)	359 (238-512)	13.04 (10.45-15.76)	0.19 (-0.08-0.53)
Nepal	0.422	1225 (897-1614)	7.55 (5.5-9.99)	1837 (1334-2371)	8.62 (6.31-11.18)	0.14 (-0.1-0.4)	878 (647-1161)	10.95 (8.12-14.42)	1263 (917-1608)	12.43 (9.07-15.75)	0.13 (-0.12-0.39)	347 (217-528)	4.22 (2.6-6.55)	574 (382-830)	4.50 (3.1-7.16)	0.22 (-0.05-0.58)
Pakistan	0.449	14 819 (11 510- 18 507)	18.22 (14.31-22.58)	18 550 (14 209- 23 969)	17.16 (13.14-22.05)	-0.06 (-0.28-0.25)	12 810 (9608-16 488)	30.17 (22.98-38.53)	15 555 (11 375- 20 942)	27.89 (20.64-37.13)	-0.08 (-0.33-0.27)	2009 (1606-2463)	5.18 (4.14-6.31)	2995 (2197-3983)	21.16 (16.49-27.08)	0.11 (-0.16-0.49)
Yemen	0.412	979 (703-1412)	10.80 (7.75-15.53)	1336 (912-1972)	10.61 (7.26-15.61)	-0.02 (-0.21-0.21)	792 (552-1167)	17.69 (12.37-26.05)	1047 (681-1639)	17.12 (11.19-26.67)	-0.03 (-0.24-0.21)	187 (142-251)	4.01 (3.03-5.36)	289 (214-390)	10.90 (8.71-13.53)	0.08 (-0.21-0.35)

Abbreviations: CI, confidence interval; SDI, sociodemographic index; TBL, tracheal, bronchial and lung.

(1 820 539/3 212 307) of TBL cancer prevalence happened in Asian countries. During this period, the ASPRoF TBL cancer with a 4% change, increased from 36.35 (95% CI: 34.01–38.67) per 100 000 in 2010 to 37.81 (95% CI: 33.46–42.14) per 100 000 in 2019, while in the same time, this rate globally decreased by 2%, in America by 12%, and in Europe by 5% (Figure 1 and Table 1).

In Asian men, the number of TBL cancer prevalence increased from 928 147 (95% CI: 861 104–1 000 537) in 2010 to 1 257 715 (95% CI: 1 069 513–1 462 350) in 2019, which is over a 1.36-fold increase. In 2019 approximately 69.1% of patients who lived with TBL cancer in Asia, were men which included 59.6% (1 257 715/2 109 409) of global male TBL cancer prevalence cases. During this period, the ASPR rate of TBL cancer with a 2% change, increased from 54.01 (95% CI: 50.08–58.12) per 100 000 in 2010 to 54.94 (95% CI: 46.96–63.32) per 100 000 in 2019, while in the same time, this rate globally decreased by 5%, in America by 11% and in Europe by 11% (Table 2).

In Asian women, the number of TBL cancer prevalence increased from 380 630 (95% CI: 349 763–411 327) in 2010 to 562 824 (95% CI: 480 164–653 889) in 2019, which is over a 1.48-fold increase. In 2019 approximately 30.9% of patients who lived with TBL cancer in Asia, were women which included 51% (562 824/1 102 899) of global female TBL cancer prevalence cases. During this period, the ASPR of TBL cancer with a 10% change, increased from 20.43 (95% CI: 18.67–22.08) per 100 000 in 2010 to 22.49 (95% CI: 19.21–26.12) per 100 000 in 2019, while in the same time, this rate globally increased by 2%, in Africa by 14%, and in Europe by 5%; while in American countries decreased by 10% (Table 3).

Age distribution

In 2019, age-specific prevalence cases of TBL cancer were peaking at 65–69 years generally, in males, and females. In all age groups, the prevalence cases of TBL cancer in males was higher than in females, except in ages above 95 years which in females was higher (Figure 6).

Within Asian regions

In 2019, the highest ASPR of TBL was observed in high-income Asia Pacific countries (74.32 [95% CI: 63.96–85.75]); with an 8% decrease compared with 2010. While these countries and Central Asia countries experienced a decreasing trend of 8% and 5%, respectively, other Asian countries experienced an increasing trend from 2010 to 2019 (by 3%–11%) (Figure 3).

In men, the highest ASPR of TBL was observed in High-income Asia Pacific countries at (114.22 [95% CI: 95.69–135.71]); with an 11% decrease compared with 2010. While these countries, Central Asia, and North Africa and Middle East countries experienced a decreasing trend of 11, 7, and

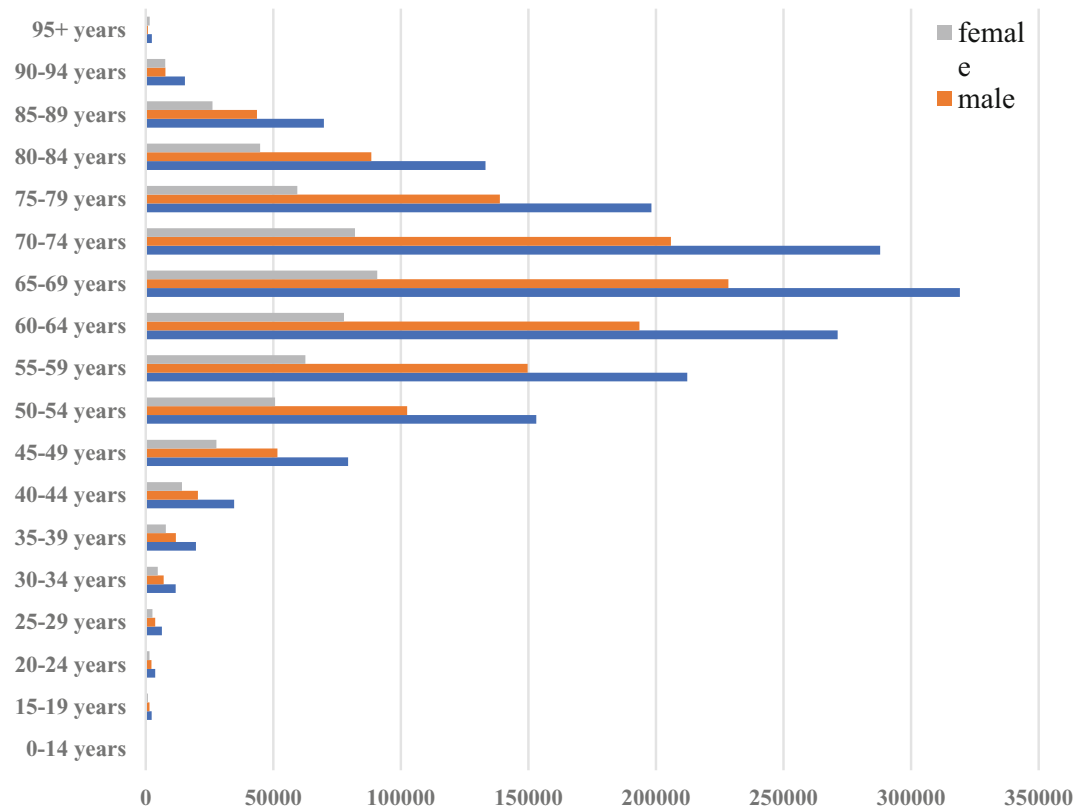


FIGURE 6 Age specific prevalence cases of TBL cancer among sexes in Asia, 2019.

3%, respectively, other Asian countries experienced an increasing trend from 2010 to 2019 (by 1%–9%) (Table 2).

In women, the highest ASPR of TBL was observed in high-income Asia Pacific countries (40.86 [95% CI: 34.13–48.03]); with a 1% decrease compared with 2010. Other countries experienced an increasing trend from 2010 to 2019 (by 6%–33%). The highest increase was reported in South Asian countries (33%). (Table 3).

Based on SDI

Among high SDI Asian countries, the Republic of Korea (75.66) and Japan (74.49) had the highest ASPR of TBL, and Saudi Arabia (9.01) had the lowest rate. Among high-middle SDI Asian countries, Turkey (34.95) and Georgia (34.83) had the highest ASPR of TBL, and Oman (9.74) had the lowest rate. Among middle SDI Asian countries, China (55.13) and Armenia (35.13) had the highest ASPR of TBL, and Turkmenistan (10.826) had the lowest rate. Among low-middle SDI Asian countries, Mongolia (29.55) and the Democratic People's Republic of Korea (29.05) had the highest ASPR of TBL, and Bangladesh (7.40) had the lowest rate. Among low SDI Asian countries, Pakistan (16.44) had the highest ASPR of TBL, and Nepal (7.71) had the lowest rate. Further details are presented in Table 6.

National comparison

Among Asian countries, 22 countries experienced a decreasing trend in the TBL cancer mortality rate between 2010 and 2019; the greatest increase was detected in Iraq (increase in ASPR = 0.22 [95% CI: 0–0.48]) and the greatest decrease was detected in Oman (decrease in ASPR = –0.17 [95% CI: –0.33–0.04]) (Figure 4).

In 2019, the highest ASPR (per 100 000) of TBL cancer was reported in the Republic of Korea (75.66), Japan (74.49), Singapore (61.39), China (55.13), and Brunei Darussalam (54.57). The lowest ASPR of TBL cancer was reported in Bangladesh (7.4), Bhutan (7.58), India (7.63), Nepal (7.71), and Saudi Arabia (9.01).

In Asian men, the highest ASPR (per 100 000) of TBL cancer was reported among men Republic of Korea (118.34), Japan (114.78), China (79), Singapore (78.05), and Georgia (68.25). The lowest ASPR (per 100 000) of TBL cancer was reported in Saudi Arabia (10.62), Bhutan (10.78), India (10.95), Nepal (10.97), and Bangladesh (11.06).

In women, the highest ASPR (per 100 000) of TBL cancer was reported in Brunei Darussalam (47.91), Singapore (46.9), the Republic of Korea (41.95), Japan (40.36), and China (33.69). The lowest ASPR (per 100 000) of TBL cancer was reported in Bangladesh (3.43), Yemen (4.18), Bhutan (4.23), India (4.48), and Nepal (4.71). Detailed results are presented in Table 6.

TABLE 6 The prevalence of TBL cancer in Asian countries in 2010 and 2019 and the temporal trends between 2010 and 2019, by geographical region and SDI.

Location	Both						Male						Female						
	2010		2019		% change 2010-2019		2010		2019		% change 2010-2019		2010		2019		% change 2010-2019		
	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	(95% CI)	(95% CI)	
High SDI																			
Brunei Darussalam	99 (91-109)	52.20 (47.58-57.25)	159 (139-180)	54.57 (48.21-61.68)	0.05 (-0.1-0.2)	53 (47-60)	64.12 (56.81-72.81)	82 (67-100)	66.37 (54.72-78.31)	0.04 (-0.15-0.25)	46 (41-52)	43.65 (38.22-49.32)	355 552 (283 761-437 708)	47.91 (40.23-56.75)	0.10 (-0.1-0.33)				
Cyprus	568 (520-623)	39.25 (36.01-42.97)	738 (627-857)	37.79 (32.07-43.96)	-0.04 (-0.2-0.14)	440 (394-494)	64.47 (58.09-71.81)	563 (456-680)	59.63 (48.33-71.87)	-0.07 (-0.25-0.14)	128 (113-145)	17.04 (15.14-19.33)	867 (633-1147)	17.54 (14.41-21.44)	0.03 (-0.17-0.26)				
Israel	2759 (2606-2927)	32.41 (30.62-34.39)	3480 (2683-4484)	31.44 (24.12-40.59)	-0.03 (-0.26-0.25)	1838 (1713-1977)	46.97 (43.77-50.44)	2277 (1720-2947)	44.02 (33.08-56.83)	-0.06 (-0.29-0.23)	921 (846-1000)	19.86 (18.28-21.62)	153 (127-182)	20.29 (15.57-26.04)	0.02 (-0.21-0.31)				
Japan	239 828 (220 045-254 311)	83.17 (77.37-87.44)	253 321 (207 167-301 074)	74.49 (62.1-88.37)	-0.10 (-0.24-0.06)	173 940 (160 796-185 273)	133.02 (124.17-140.89)	178 822 (142 682-222 462)	114.78 (91.52-142.05)	-0.14 (-0.3-0.07)	65 888 (56 557-72 450)	42.00 (37.73-45.16)	882 (732-1039)	40.36 (32.04-49.65)	-0.04 (-0.21-0.17)				
Kuwait	140 (130-149)	10.05 (9.28-10.72)	259 (216-310)	10.32 (8.46-12.42)	0.03 (-0.15-0.23)	100 (92-107)	11.92 (10.92-12.79)	181 (139-227)	12.72 (9.79-15.96)	0.07 (-0.17-0.34)	40 (36-44)	6.93 (6.21-7.7)	1882 (1457-2409)	6.63 (5.22-8.49)	-0.04 (-0.25-0.21)				
Qatar	83 (67-102)	20.42 (16.78-24.68)	153 (107-213)	17.54 (13.23-22.69)	-0.14 (-0.36-0.14)	68 (52-86)	23.84 (18.86-29.61)	120 (81-174)	18.97 (14.08-25.29)	-0.20 (-0.43-0.09)	15 (12-19)	13.06 (10.4-16.04)	74 499 (56 948-92 097)	13.47 (10.35-16.86)	0.03 (-0.19-0.28)				
Republic of Korea	45 010 (40 638-50 489)	71.02 (64.09-79.28)	68 345 (55 468-83 426)	75.66 (61.36-92.07)	0.07 (-0.14-0.31)	31 756 (27 724-36 550)	117.33 (102.56-134.48)	47 936 (37 412-60 031)	118.34 (92.79-148.38)	0.01 (-0.21-0.29)	13 254 (11 604-15 012)	37.40 (32.83-42.09)	1203 (927-1536)	41.95 (33.8-50.7)	0.12 (-0.09-0.38)				
Saudi Arabia	1156 (1009-1359)	8.97 (8-10.18)	1848 (1411-2305)	9.01 (7.13-10.91)	0.00 (-0.2-0.21)	829 (725-981)	11.46 (10.24-13.39)	1239 (928-1560)	10.62 (8.17-13.27)	-0.07 (-0.27-0.15)	327 (279-378)	5.54 (4.81-6.33)	609 (451-786)	6.53 (4.9-8.28)	0.18 (-0.1-0.48)				
Singapore	3245 (2924-3587)	65.18 (58.54-72.18)	4818 (3741-6168)	61.39 (48.02-78.24)	-0.06 (-0.26-0.2)	2022 (1770-2314)	88.58 (77.32-101.94)	2936 (2193-3842)	78.05 (58.72-101.45)	-0.12 (-0.33-0.14)	1223 (1077-1384)	46.20 (40.58-52.49)	2247 (1497-3209)	46.90 (36.25-59.99)	0.02 (-0.21-0.29)				
Taiwan (Province of China)	14 224 (13 443-15 014)	46.92 (44.32-49.51)	16 026 (12 395-20 728)	40.73 (31.55-52.71)	-0.13 (-0.33-0.12)	8775 (8230-9366)	59.88 (56.15-63.93)	9654 (7375-12 486)	52.09 (39.87-66.95)	-0.13 (-0.34-0.13)	5449 (4995-5896)	34.84 (31.93-37.68)	570 (382-817)	30.87 (24-40.24)	-0.11 (-0.31-0.15)				
United Arab Emirates	260 (207-314)	20.24 (16.69-24.01)	627 (454-835)	16.87 (12.24-23.29)	-0.17 (-0.36-0.08)	199 (155-246)	22.15 (17.66-26.99)	492 (349-669)	19.03 (13.97-26.33)	-0.14 (-0.32-0.1)	61 (47-75)	16.86 (13.48-20.84)	283 (233-340)	12.51 (7.54-18.28)	-0.26 (-0.54-0.13)				
High-middle SDI																			
Bahrain	90 (79-101)	21.50 (19.05-24.08)	155 (117-205)	18.01 (13.69-22.9)	-0.16 (-0.34-0.05)	64 (55-74)	29.29 (25.45-33.36)	109 (79-152)	22.56 (16.86-29.66)	-0.23 (-0.42-0.01)	26 (22-30)	13.50 (11.69-15.61)	1649 (1254-2116)	12.83 (10.19-15.62)	-0.05 (-0.24-0.15)				
Georgia	1802 (1632-1969)	32.75 (29.65-35.86)	1949 (1614-2329)	34.83 (28.85-41.54)	0.06 (-0.14-0.3)	1527 (1366-1689)	63.97 (57.15-70.75)	1666 (1371-1996)	68.25 (56.18-81.57)	0.07 (-0.14-0.31)	275 (248-306)	8.73 (7.86-9.71)	7808 (5853-10 343)	8.96 (7.35-10.77)	0.03 (-0.18-0.26)				

(Continues)

TABLE 6 (Continued)

Location	Both			Male			Female		
	SDI 2019	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)
	2019	2010	2019	2010	2019	2010	2010	2019	2010
Jordan	0.731	14.97	-0.03	400	22.53	-0.09	121	6.87	0.17
	(464-584)	(13.37-16.75)	(-0.21-0.18)	(349-459)	(19.73-25.71)	(-0.3-0.16)	(104-140)	(5.9-7.96)	(-0.07-0.48)
Kazakhstan	0.723	27.05	-0.14	3298	53.98	-0.18	721	8.37	0.01
	(3814-4251)	(25.66-28.49)	(-0.27-0.01)	(3096-3536)	(50.82-57.63)	(-0.31-0.04)	(681-768)	(7.92-8.91)	(-0.17-0.2)
Lebanon	0.708	28.93	0.05	815	40.36	-0.03	406	18.48	0.25
	(1045-1542)	(24.76-36.28)	(-0.12-0.24)	(675-1052)	(33.56-52.1)	(-0.19-0.16)	(336-515)	(15.29-23.43)	(-0.06-0.56)
Malaysia	0.737	21.04	-0.04	2928	29.58	-0.04	1237	12.60	-0.04
	(3815-4583)	(19.19-23.21)	(-0.25-0.21)	(2660-3246)	(26.8-32.81)	(-0.26-0.22)	(1118-1368)	(11.37-14.06)	(-0.26-0.22)
Oman	0.783	11.80	-0.17	92	15.11	-0.23	38	7.78	0.00
	(118-143)	(10.72-12.89)	(-0.33-0.04)	(83-102)	(13.61-16.82)	(-0.4-0.04)	(34-44)	(6.74-8.9)	(-0.25-0.24)
Sri Lanka	0.69	10.63	0.01	1604	17.10	-0.04	566	5.22	0.17
	(2037-2306)	(10-11.3)	(-0.27-0.37)	(1481-1725)	(15.81-18.3)	(-0.33-0.34)	(518-619)	(4.78-5.71)	(-0.15-0.54)
Turkey	0.748	35.56	-0.02	20 625	62.65	-0.06	3988	11.01	0.19
	(21 619-27 940)	(31.23-40.27)	(-0.24-0.29)	(18 045-23 490)	(54.81-71.26)	(-0.27-0.24)	(3478-4545)	(9.61-12.58)	(-0.08-0.53)
Middle SDI									
Armenia	0.689	38.05	-0.08	1174	72.41	-0.09	246	11.65	-0.03
	(1357-1486)	(36.45-39.78)	(-0.23-0.1)	(1116-1233)	(68.91-76)	(-0.24-0.09)	(230-263)	(10.91-12.43)	(-0.21-0.17)
Azerbaijan	0.683	24.88	0.02	1577	43.69	0.02	379	9.04	0.04
	(1658-2237)	(21.13-28.3)	(-0.18-0.26)	(1287-1849)	(35.73-51.1)	(-0.22-0.31)	(329-441)	(7.78-10.43)	(-0.18-0.32)
China	0.686	761 233	49.44	554 950	71.85	0.10	226 282	28.91	0.17
	(693 273-835 137)	(45.12-54.12)	(-0.09-0.34)	(475 301-600 750)	(64.16-80.29)	(-0.14-0.41)	(200 660-252 832)	(25.66-32.31)	(-0.08-0.47)
Indonesia	0.66	36 236	20.76	24 946	30.21	0.06	11 290	12.27	0.10
	(28 719-42 387)	(16.56-24.13)	(-0.13-0.3)	(20 103-30 912)	(24.77-36.89)	(-0.19-0.36)	(6970-16 045)	(7.6-17.29)	(-0.15-0.42)
Iran (Islamic Republic of)	0.67	5867	10.58	4071	14.81	0.10	1796	6.32	0.40
	(5631-6141)	(10.1-11.08)	(0.1-0.27)	(3887-4277)	(14.06-15.55)	(0.01-0.19)	(1704-1898)	(5.94-6.68)	(0.25-0.53)
Iraq	0.671	2546	15.40	1883	23.61	0.16	664	7.54	0.42
	(1976-3165)	(12.07-18.97)	(0-0.48)	(1428-2390)	(18.02-29.65)	(-0.06-0.46)	(501-862)	(5.76-9.73)	(0.11-0.84)
Philippines	0.623	10 548	17.23	7667	26.95	-0.03	2881	8.85	0.17
	(9593-11 828)	(15.69-19.3)	(-0.19-0.28)	(6777-8908)	(23.87-31.2)	(-0.3-0.28)	(2560-3274)	(7.87-10.02)	(-0.15-0.59)

TABLE 6 (Continued)

Location	Both				Male				Female						
	SDI 2019	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)		
														2019	2010
Syrian Arab Republic	0.619	1303	11.86	11.37	-0.04	944	16.54	1052	15.43	-0.07	360	6.73	6147	7.14	0.06
		(1064-1562)	(9.74-14.19)	(8.39-15.01)	(-0.28-0.25)	(757-1162)	(13.27-20.34)	(759-1405)	(11.28-20.4)	(-0.32-0.25)	(290-436)	(5.5-8.03)	(4867-7714)	(4.89-9.67)	(-0.25-0.41)
Thailand	0.687	19 013	25.39	24.361	-0.06	12 622	36.50	15 986	33.82	-0.07	6391	15.94	12	15.19	-0.05
		(16 557-21 431)	(22.19-28.6)	(18 211-32 138)	(-0.31-0.26)	(10 739-14 550)	(31.19-42.01)	(11 712-21 314)	(24.81-44.92)	(-0.33-0.27)	(5578-7259)	(13.9-18.15)	(8-19)	(11.31-20.08)	(-0.31-0.29)
Turkmenistan	0.67	301	9.18	10.82	0.18	226	15.40	361	17.86	0.16	75	4.17	1359	5.06	0.21
		(285-316)	(8.68-9.69)	(376-606)	(-0.07-0.49)	(211-240)	(14.45-16.38)	(279-461)	(13.98-22.45)	(-0.09-0.47)	(68-82)	(3.78-4.6)	(1018-1763)	(3.92-6.45)	(-0.05-0.53)
Uzbekistan	0.631	2079	12.03	13.26	0.10	1510	19.67	2321	21.02	0.07	569	5.95	27 010	7.10	0.19
		(1979-2184)	(11.48-12.6)	(2682-3914)	(-0.08-0.31)	(1414-1608)	(18.51-20.86)	(1882-2825)	(17.42-25.08)	(-0.12-0.28)	(536-606)	(5.6-6.33)	(20 873-33 809)	(5.9-8.47)	(-0.02-0.44)
Vietnam	0.617	18 774	26.15	28.89	0.11	13 812	44.07	21 179	47.41	0.08	4962	12.42	458	14.36	0.16
		(16 310-21 668)	(22.88-30.02)	(22 215-37 389)	(-0.12-0.35)	(12 031-15 833)	(38.94-50.04)	(15 882-27 265)	(36.26-59.99)	(-0.14-0.33)	(4043-6080)	(10.18-15.27)	(314-632)	(10.77-18.76)	(-0.1-0.45)
Low-middle SDI															
Bangladesh	0.483	6760	7.45	9.890	-0.01	5531	11.41	7643	11.06	-0.03	1229	2.84	7	3.43	0.21
		(4985-9276)	(5.55-10.1)	(6398-15 551)	(-0.27-0.3)	(4064-7715)	(8.47-15.67)	(4841-12 420)	(7.05-17.81)	(-0.32-0.3)	(857-1743)	(1.95-4.01)	(6-8)	(2.27-4.9)	(-0.07-0.53)
Bhutan	0.455	32	7.01	43	0.08	24	10.23	31	10.78	0.05	8	3.54	3388	4.23	0.20
		(24-42)	(5.3-9.16)	(31-60)	(-0.1-0.3)	(16-33)	(6.84-13.92)	(20-45)	(6.92-15.38)	(-0.13-0.28)	(5-13)	(2.29-5.85)	(2596-4487)	(2.82-6.66)	(-0.02-0.5)
Cambodia	0.469	1971	22.25	2962	0.08	1455	40.19	2137	42.08	0.05	516	9.79	15 925	11.46	0.17
		(1633-2416)	(18.43-27.5)	(2290-3681)	(-0.11-0.28)	(1170-1825)	(32.6-51.57)	(1642-2702)	(32.44-53.93)	(-0.14-0.26)	(418-635)	(8-12.06)	(8875-24 064)	(8.75-14.68)	(-0.06-0.44)
Democratic People's Republic of Korea	0.558	8127	29.44	9574	-0.01	5595	49.09	6535	46.15	-0.06	2532	16.01	47	16.48	0.03
		(6172-10 588)	(22.51-38.09)	(7289-12 305)	(-0.16-0.16)	(3941-7719)	(35.39-56.33)	(4626-8930)	(33.51-61.61)	(-0.21-0.12)	(1892-3212)	(12-20.27)	(33-67)	(11.68-22.04)	(-0.18-0.27)
India	0.566	60 661	6.82	90 058	0.12	45 985	10.53	63 048	10.95	0.04	14 676	3.25	4516	4.48	0.38
		(55 822-65 774)	(6.28-7.4)	(73 919-106 987)	(-0.08-0.32)	(41 696-50 441)	(9.53-11.55)	(49 324-78 677)	(8.6-13.6)	(-0.19-0.28)	(12 940-16 350)	(2.85-3.63)	(3333-5976)	(3.48-5.61)	(0.06-0.75)
Kyrgyzstan	0.596	503	13.66	636	-0.05	390	24.23	483	22.29	-0.08	112	5.37	136	5.67	0.05
		(480-524)	(13.04-14.25)	(550-726)	(-0.18-0.08)	(370-409)	(23.06-25.39)	(415-552)	(19.31-25.41)	(-0.21-0.06)	(105-120)	(4.98-5.76)	(92-181)	(4.7-6.72)	(-0.12-0.25)
Lao People's Democratic Republic	0.49	732	21.23	1007	0.04	549	33.70	734	33.61	0.00	182	9.86	516	11.27	0.14
		(557-952)	(16.27-27.23)	(730-1330)	(-0.16-0.27)	(404-737)	(25.05-45.08)	(525-963)	(24.54-43.13)	(-0.2-0.24)	(137-258)	(7.58-13.9)	(396-657)	(8.1-16.21)	(-0.09-0.4)

(Continues)

TABLE 6 (Continued)

Location	Both						Male						Female							
	2019		2010		2019		2010		2019		2010		2019		2010		2019		2010	
	SDI 2019	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change 2010-2019 (95% CI)	
Maldives	0.562	19 (17-21)	9.55 (8.55-10.63)	0.02 (7.95-11.65)	29 (24-35)	9.72 (7.95-11.65)	0.02 (-0.16-0.22)	14 (13-16)	13.80 (12.08-15.7)	0.00 (11.12-16.7)	4 (4-5)	4.52 (3.89-5.22)	0.00 (-0.2-0.23)	22 (18-27)	13.78 (11.12-16.7)	0.00 (-0.2-0.23)	925 (757-1123)	4.52 (3.89-5.22)	0.11 (-0.11-0.38)	
Mongolia	0.606	446 (368-535)	28.88 (23.89-34.11)	0.02 (23.23-38.17)	691 (532-911)	29.55 (23.23-38.17)	0.02 (-0.19-0.3)	354 (288-429)	52.33 (43.3-62.07)	0.03 (40.88-70.52)	92 (75-113)	11.31 (9.3-13.77)	0.03 (-0.2-0.33)	549 (405-733)	54.16 (40.88-70.52)	0.03 (-0.2-0.33)	263 (216-312)	11.31 (9.3-13.77)	0.02 (-0.21-0.3)	
Myanmar	0.521	8067 (5843-11 322)	21.71 (15.91-30.39)	0.01 (16.11-29.98)	10 552 (7740-14 581)	21.88 (16.11-29.98)	0.01 (-0.18-0.25)	5616 (3737-8825)	34.02 (22.84-53.25)	0.00 (5031-10 664)	2451 (1918-3172)	11.87 (9.29-15.44)	0.00 (-0.2-0.26)	7165 (5031-10 664)	34.08 (24.19-50.42)	0.00 (-0.2-0.26)	78 (60-101)	11.87 (9.29-15.44)	0.06 (-0.13-0.3)	
Palestine	0.588	333 (302-365)	18.77 (17.05-20.53)	0.20 (18.96-26.21)	568 (481-667)	22.43 (18.96-26.21)	0.20 (-0.01-0.42)	259 (232-287)	32.36 (29.01-35.86)	0.12 (36.8-51.0)	74 (65-85)	7.45 (6.53-8.49)	0.12 (-0.08-0.34)	435 (368-510)	36.28 (30.96-42.04)	0.12 (-0.08-0.34)	3337 (3012-3652)	7.45 (6.53-8.49)	0.33 (0.04-0.66)	
Tajikistan	0.539	529 (458-611)	13.10 (11.24-15.21)	-0.09 (9.67-14.81)	665 (532-838)	11.93 (9.67-14.81)	-0.09 (-0.28-0.16)	389 (330-455)	19.76 (16.62-23.22)	-0.12 (35.8-58.4)	140 (121-163)	6.65 (5.73-7.73)	-0.12 (-0.32-0.13)	455 (358-584)	17.39 (13.86-22.12)	-0.12 (-0.32-0.13)	59 (43-72)	6.65 (5.73-7.73)	0.05 (-0.18-0.34)	
Timor-Leste	0.514	109 (77-144)	16.46 (11.77-21.54)	0.14 (13.4-24.66)	160 (113-209)	18.82 (13.4-24.66)	0.14 (-0.11-0.44)	79 (51-106)	23.77 (15.59-31.87)	0.13 (75-150)	30 (22-48)	9.12 (6.77-14.42)	0.13 (-0.13-0.45)	113 (75-150)	26.88 (17.96-35.27)	0.13 (-0.13-0.45)	134 (109-161)	9.12 (6.77-14.42)	0.20 (-0.09-0.55)	
Low SDI																				
Afghanistan	0.343	1112 (610-1900)	11.06 (6.25-19.01)	0.02 (6.78-17.88)	1576 (895-2505)	11.25 (6.78-17.88)	0.02 (-0.17-0.3)	868 (441-1624)	18.75 (9.67-35.17)	-0.03 (63.3-205.4)	245 (163-360)	4.22 (2.97-6.03)	-0.03 (-0.21-0.26)	1170 (633-2054)	18.26 (10.39-31.65)	-0.03 (-0.21-0.26)	825 (626-1063)	4.22 (2.97-6.03)	0.20 (-0.07-0.55)	
Nepal	0.422	1184 (862-1570)	6.72 (4.92-8.88)	0.15 (5.53-9.98)	1764 (1267-2294)	7.71 (5.53-9.98)	0.15 (-0.1-0.43)	839 (613-1115)	9.64 (7.09-12.76)	0.14 (85.6-154.5)	345 (220-516)	3.83 (2.42-5.77)	0.14 (-0.11-0.41)	1194 (856-1545)	10.97 (7.94-14.04)	0.14 (-0.11-0.41)	45 (35-56)	3.83 (2.42-5.77)	0.23 (-0.03-0.6)	
Pakistan	0.449	15 392 (12 086-19 136)	17.22 (13.56-21.3)	-0.05 (14 826-26 083)	19 632 (14 826-26 083)	16.44 (12.48-21.7)	-0.05 (-0.29-0.3)	13 304 (10 044-16 978)	28.50 (21.72-36.19)	-0.06 (11 900-22 596)	2088 (1631-2574)	4.82 (3.78-5.88)	-0.06 (-0.34-0.33)	16 467 (11 900-22 596)	26.68 (19.42-36.34)	-0.06 (-0.34-0.33)	33 (24-43)	4.82 (3.78-5.88)	0.13 (-0.17-0.55)	
Yemen	0.412	977 (695-1409)	9.72 (7-14)	-0.02 (6.56-14.22)	1345 (909-2008)	9.57 (6.56-14.22)	-0.02 (-0.21-0.22)	776 (535-1165)	15.56 (10.83-23.11)	-0.03 (6.69-16.39)	201 (149-274)	3.81 (2.88-5.11)	-0.03 (-0.24-0.23)	1030 (669-1639)	15.12 (9.8-23.75)	-0.03 (-0.24-0.23)	271 (210-348)	3.81 (2.88-5.11)	0.10 (-0.2-0.39)	

Abbreviations: CI, confidence interval; DALYs, disability-adjusted life-years; SDI, sociodemographic index; TBL, tracheal, bronchial and lung.

Burden of TBL cancer in Asia

Comparison with global data and continents

In Asia, the number of TBL cancer DALYs increased from 21 516 974 (95% CI: 20 162 682–22 913 727) in 2010 to 27 120 537 (95% CI: 23 951 875–30 414 194) in 2019, which is a 1.26-fold increase. In 2019 more than 59% (27 120 537/45 857 963) of TBL cancer DALYs happened in Asian countries. During this period, the age-standardized DALYs rate (DALYs ASR) of TBL cancer with a 4% change, decreased from 579.16 (95% CI: 543.52–616.66) per 100 000 in 2010 to 553.68 (95% CI: 488.57–619.78) per 100 000 in 2019, in the same period, this rate globally decreased by 7%, in America by 11%, and in Europe by 510%, Africa by 1% (Figure 1 and Table 1).

In Asian men, the number of TBL cancer DALYs increased from 15 471 795 (95% CI: 14 340 748–16 696 371) in 2010 to 19 032 930 (95% CI: 16 188 395–21 991 610) in 2019, which is over a 1.23-fold increase. In 2019 approximately 70.2% of TBL cancer DALYs in Asia, occurred in men which included 60.3% (19 032 930/31 582 258) of global male TBL cancer DALYs cases. During this period, the DALYs ASR rate of TBL cancer with a 7% change, decreased from 862.61 (95% CI: 800.85–929.03) per 100 000 in 2010 to 806.43 (95% CI: 688.15–928.33) per 100 000 in 2019, in the same period, this rate globally decreased by 10%, in America by 13%, in Europe by 14%, and Africa by 3% (Table 2).

In Asian women, the number of TBL cancer DALYs increased from 6 045 179 (95% CI: 5 551 988–6 575 776) in 2010 to 8 087 606 (95% CI: 6 962 536–9 358 865) in 2019, which is over a 1.34-fold increase. In 2019, approximately 29.8% of DALYs related to TBL cancer in Asia were women which included 56.6% (8 087 606/14 275 706) of global female TBL cancer DALYs cases. During this period, the DALYs ASR rate of TBL cancer with a 1% change, increased from 316.95 (95% CI: 290.95–344.55) per 100 000 in 2010 to 321.18 (95% CI: 276.65–371.34) per 100 000 in 2019, while in the same time, this rate globally decreased by 1%, and in American countries decreased by 10%. European countries experienced a stable trend and African countries experienced an increasing trend of 11% (Table 3).

Age distribution

In 2019, age-specific DALYs cases of TBL cancer peaked at 65–69 years generally, in males, and females. In all age groups, DALYs cases of TBL cancer in males were higher than in females, except in ages above 90 years which in females was higher (Figure 7).

Within Asian regions

In 2019, the highest DALYs ASR of TBL was observed in East Asian countries (825.81 [95% CI: 696.85–969.46]); with

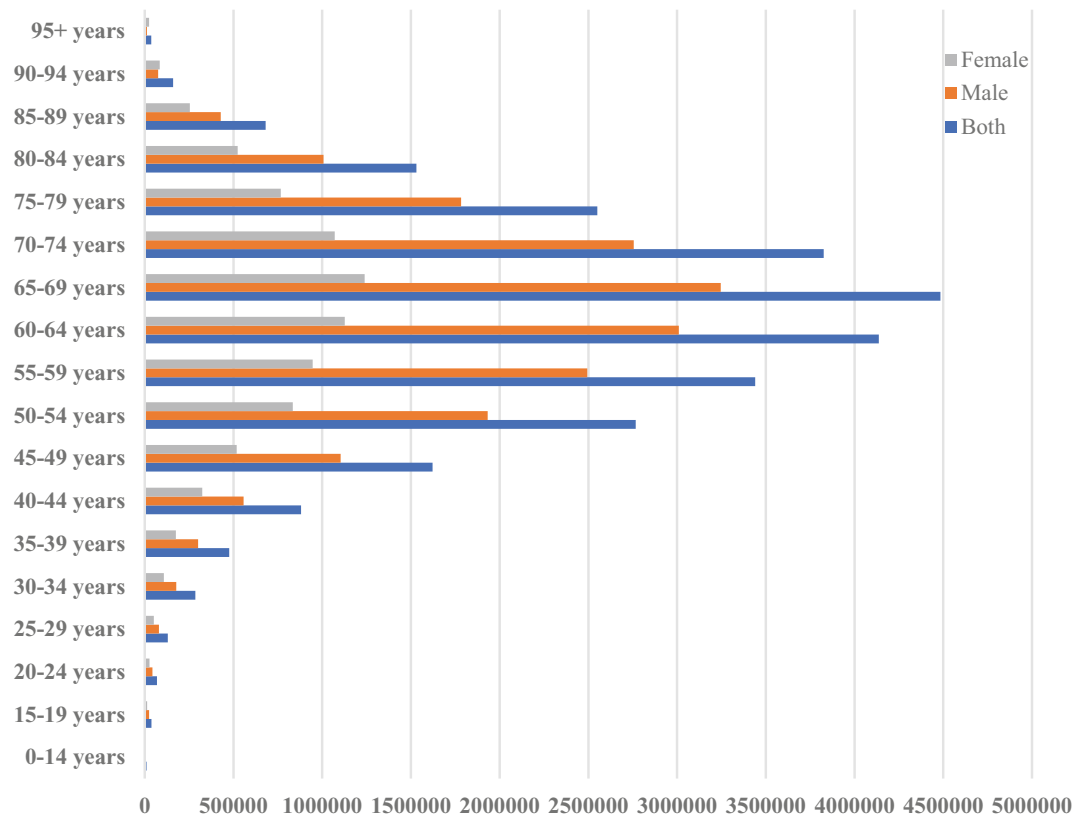


FIGURE 7 Age specific DALYs cases of TBL cancer among sexes in Asia, 2019.

TABLE 7 The DALYs of TBL cancer in Asian countries in 2010 and 2019 and the temporal trends between 2010 and 2019, by geographical region and SDI.

Location	Both		Male				% change 2010–2019 (95% CI)	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	
	2010		2019		2019					
	SDI 2019 lower	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)				
High SDI										
Brunei Darussalam	0.823	1736 (1579–1914)	881.93 (806.29–967.48)	2578 (2268–2923)	867.69 (768.53–975.37)	964 (852–1089)	1117.64 (990.1–1251.24)	1402 (1163–1666)	1086.94 (917.83–1259.12)	-0.03 (-0.19–0.15)
Cyprus	0.841	7851 (7365–8373)	543.85 (511.28–580.29)	9677 (8511–10 948)	496.50 (437.29–562.21)	6146 (5717–6629)	905.87 (844.61–975.76)	7498 (6527–8559)	796.91 (695.12–911.42)	-0.12 (-0.24–0.01)
Israel	0.803	45 045 (43 220–46 601)	530.55 (509.75–548.41)	52 637 (49 095–55 907)	478.11 (446.69–507.47)	30 992 (29 743–32 194)	792.34 (761.06–823.47)	35 769 (33 302–38 347)	694.47 (646.72–745.22)	-0.12 (-0.18–0.06)
Japan	0.87	1 354 942 (1 244 988–1 409 971)	475.84 (445.3–491.42)	1 347 365 (1 211 168–1 426 790)	408.04 (378.67–427.43)	1 005 355 (945 825–1 037 352)	778.59 (737.05–801.79)	966 169 (890 896–1 017 886)	638.55 (595.3–669.43)	-0.18 (-0.21–0.15)
Kuwait	0.851	3187 (2983–3386)	221.34 (205.84–235.27)	5541 (4539–6683)	214.80 (174.68–260.68)	2429 (2244–2610)	278.57 (257.37–298.19)	4263 (3277–5348)	287.61 (222.72–360.28)	0.03 (-0.19–0.3)
Qatar	0.83	2037 (1638–2534)	457.40 (373.58–556.09)	3497 (2442–4860)	373.88 (279.21–491.27)	1742 (1339–2214)	555.43 (440.05–691.03)	2925 (1985–4180)	426.90 (315.74–572.97)	-0.23 (-0.45–0.06)
Republic of Korea	0.878	363 214 (345 908–385 465)	572.49 (543.45–608.08)	448 177 (407 150–489 987)	498.37 (452.28–545.03)	270 501 (258 260–289 258)	989.99 (942.81–1057.22)	329 780 (295 922–365 420)	812.08 (726.93–896.9)	-0.18 (-0.26–0.09)
Saudi Arabia	0.805	30 004 (26 190–34 824)	219.72 (196.73–251.56)	45 488 (34 469–57 172)	208.01 (162.62–253.25)	22 272 (19 367–26 307)	288.97 (258.76–338.48)	32 838 (24 493–41 864)	260.49 (199.92–324.97)	-0.10 (-0.29–0.12)
Singapore	0.861	25 678 (24 501–26 642)	508.08 (481.56–527.39)	32 008 (29 533–34 271)	406.24 (373.24–435.04)	17 179 (16 388–17 912)	732.85 (694.31–763.13)	20 883 (19 024–22 407)	549.33 (499.22–590.64)	-0.25 (-0.32–0.19)
Taiwan (Province of China)	0.868	201 116 (191 569–208 015)	663.19 (630.62–686.06)	250 042 (195 264–323 024)	638.74 (500.04–824.72)	130 642 (124 689–135 612)	889.24 (847.68–923.17)	156 142 (122 385–204 204)	847.27 (665.16–1101.66)	-0.05 (-0.26–0.24)
United Arab Emirates	0.88	7069 (5634–8636)	491.67 (404.44–584.94)	16 698 (12 066–22 166)	406.46 (295.09–559.14)	5564 (4352–6903)	549.42 (438.29–669.67)	13 406 (9528–18 308)	468.70 (343.4–645.66)	-0.15 (-0.33–0.09)
High-middle SDI										
Bahrain	0.751	2162 (1898–2450)	485.53 (429.2–542.66)	3546 (2675–4751)	392.08 (294.96–503.78)	1618 (1383–1865)	687.65 (596.79–783.11)	2677 (1931–3710)	518.94 (386.88–684.76)	-0.25 (-0.43–0.01)
Georgia	0.702	43 531 (39 541–47 494)	797.62 (724.62–872.98)	45 743 (37 925–54 188)	828.59 (684.05–980.38)	37 079 (33 184–40 916)	1556.10 (1385.03–1718.34)	39 358 (32 601–46 938)	1623.55 (1343.63–1925.24)	0.04 (-0.16–0.28)
Jordan	0.731	12 952 (11 485–14 706)	360.35 (321.08–405.56)	24 231 (19 817–29 413)	338.02 (276.61–409.77)	10 217 (8916–11 730)	556.96 (488.61–636.3)	18 653 (14 277–23 721)	497.83 (385.83–628.29)	-0.11 (-0.32–0.14)

TABLE 7 (Continued)

Location	SDI 2019 lower	Male									
		Both					Male				
		2010	2019	% change 2010–2019	2010	2019	% change 2010–2019	2010	2019	% change 2010–2019	
Kazakhstan	0.723	100 157	667.21	99 098	529.99	-0.21	82 595	1331.23	79 489	1011.22	-0.24
		(95 CI)	(633.87–703.56)	(84 119–114 547)	(452.01–608.74)	(-0.33–0.07)	(77 609–88 472)	(1252.99–1420.47)	(66 646–93 305)	(856.32–1179.95)	(-0.36–0.11)
Lebanon	0.708	27 614	653.49	32 712	629.57	-0.04	19 893	985.74	21 762	926.00	-0.06
		(23 464–34 891)	(555.91–825.18)	(26 403–42 585)	(507.29–817.1)	(-0.19–0.13)	(16 580–25 367)	(824.21–1255.03)	(17 023–28 494)	(725.13–1215.38)	(-0.21–0.11)
Malaysia	0.737	99 296	492.31	125 454	452.95	-0.08	70 051	694.58	88 682	640.66	-0.08
		(91 031–108 913)	(449.62–541.33)	(95 772–158 721)	(349.01–573.29)	(-0.29–0.16)	(63 605–77 170)	(630.74–767.54)	(67 490–113 258)	(490.41–816.72)	(-0.29–0.17)
Oman	0.783	3145	275.24	3876	211.73	-0.06	2343	369.58	2755	274.30	-0.26
		(2856–3450)	(250.81–302.08)	(3002–5245)	(170.66–267.77)	(-0.3–0.27)	(2108–2612)	(332.63–411.06)	(2018–4078)	(211.84–366.38)	(-0.42–0.01)
Sri Lanka	0.69	50 700	246.24	61 125	231.39	-0.04	37 667	397.26	42 870	355.96	-0.10
		(47 614–53 917)	(231.9–261.63)	(44 055–83 501)	(167.54–315.61)	(-0.25–0.24)	(34 739–40 500)	(368.42–425.46)	(29 685–60 571)	(248.38–498.89)	(-0.37–0.25)
Turkey	0.748	606 723	868.40	743 637	814.58	0.15	521 564	1564.61	625 682	1431.86	-0.08
		(535 329–685 649)	(766.16–982.9)	(585 408–929 199)	(643.77–1017)	(-0.1–0.45)	(455 485–593 194)	(1372.32–1780.42)	(493 490–787 341)	(1132.21–1796.08)	(-0.3–0.2)
Middle SID											
Armenia	0.689	32 931	881.64	32 530	772.08	-0.12	27 383	1679.98	26 989	1456.82	-0.13
		(31 610–34 420)	(847.73–919.95)	(27 097–38 700)	(644.04–919.53)	(-0.27–0.05)	(26 166–28 753)	(1607.69–1765.83)	(22 437–32 354)	(1215.4–1753.28)	(-0.28–0.04)
Azerbaijan	0.683	50 528	627.24	67 384	615.53	-0.02	40 885	1103.50	55 020	1083.21	-0.02
		(42 848–57 711)	(531.96–712.77)	(49 096–86 484)	(453.49–778.51)	(-0.21–0.21)	(33 344–47 893)	(905.06–1286.31)	(37 056–73 911)	(739–1437.01)	(-0.25–0.27)
China	0.686	13 706 787	878.34	17 128 584	831.27	-0.05	9 750 174	1285.67	11 967 767	1203.78	-0.06
		(12 490 817–14 986 265)	(802.07–956.93)	(14 340 491–20 231 342)	(699.11–979.99)	(-0.22–0.14)	(8 652 617–10 933 563)	(1148.32–1434.13)	(9 374 367–14 952 335)	(950.19–1495.1)	(-0.27–0.19)
Indonesia	0.66	951 020	531.75	1 279 981	555.79	0.05	652 011	771.88	872 361	795.96	0.03
		(768 970–1 118 598)	(432.67–622.97)	(927 626–1 596 040)	(404.21–685.35)	(-0.15–0.26)	(522 694–808 743)	(627.82–940.17)	(632 434–1 170 979)	(584.55–1045.61)	(-0.21–0.33)
Iran (Islamic Republic of)	0.67	145 184	255.72	218 990	286.82	0.12	104 036	369.43	150 337	396.94	0.07
		(139 547–151 340)	(244.38–266.88)	(203 461–234 523)	(266.09–307.6)	(0.05–0.2)	(99 266–108 916)	(351.11–387.4)	(137 471–164 431)	(364.05–434.82)	(-0.01–0.17)
Iraq	0.671	66 028	388.14	110 712	451.59	0.16	49 430	600.79	79 463	675.57	0.12
		(51 003–82 497)	(303.02–480.89)	(84 178–139 887)	(346.04–557.52)	(-0.05–0.42)	(37 525–62 971)	(458.88–759.13)	(60 517–100 726)	(516.66–825.13)	(-0.09–0.41)
Philippines	0.623	274 077	438.06	373 177	443.59	-0.18	201 099	684.08	258 071	658.20	-0.04
		(249 033–307 840)	(398.81–491.29)	(300 745–458 874)	(359.55–543.86)	(-0.39–0.08)	(176 964–228 943)	(609.27–784.78)	(194 607–334 686)	(499.78–848.85)	(-0.28–0.25)
Syrian Arab Republic	0.619	32 840	289.91	36 951	274.37	-0.10	24 536	418.24	26 803	389.30	-0.07
		(26 864–39 516)	(236.81–347.76)	(26 937–49 538)	(202.98–363.54)	(-0.3–0.14)	(19 591–30 237)	(335.64–513.89)	(19 320–36 087)	(283.36–517.06)	(-0.32–0.25)
Thailand	0.687	437 879	575.84	524 356	512.94	0.14	292 638	830.38	348 203	735.77	-0.11
		(381 744–495 015)	(503.63–649.94)	(389 891–698 681)	(382.75–681.94)	(-0.11–0.45)	(249 564–336 188)	(709.5–953.68)	(253 961–465 752)	(538.38–977.94)	(-0.36–0.22)

(Continues)

TABLE 7 (Continued)

Location	SDI 2019 lower	Both						Male					
		2010		2019		% change 2010–2019		2010		2019		% change 2010–2019	
		Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	ASR per 100 000 (95% CI)	% change (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	Number (95% CI)	ASR per 100 000 (95% CI)	% change (95% CI)	
Turkmenistan	0.67	7793 (7379–8188)	232.03 (220.21–244.35)	11 915 (9357–15 098)	265.85 (209.71–336.07)	-0.17 (-0.36–0.07)	5868 (5479–6243)	387.83 (363.74–411.91)	9035 (7009–11 546)	438.57 (343.74–552.56)	0.13 (-0.12–0.44)		
Uzbekistan	0.631	53 638 (51 091–56 334)	300.38 (286.41–314.34)	80 570 (66 295–96 841)	320.85 (266.53–380.72)	0.05 (-0.16–0.28)	38 995 (36 607–41 509)	490.90 (462.79–520.87)	57 824 (47 028–70 213)	510.33 (421.64–610.42)	0.04 (-0.15–0.26)		
Vietnam	0.617	468 294 (40 6280–541 940)	639.58 (557.93–736.21)	676 894 (514 966–873 765)	668.83 (512.02–853.16)	-0.20 (-0.25–0.15)	347 144 (300 374–398 441)	1079.86 (950.74–1229.85)	498 965 (374 943–644 026)	1102.40 (837.95–1402.61)	0.02 (-0.19–0.26)		
Low-middle SDI													
Bangladesh	0.483	175 070 (128 455–241 803)	188.69 (139.99–257.39)	245 789 (158 426–385 218)	181.71 (117.75–284.34)	-0.04 (-0.29–0.26)	142 318 (103 834–198 827)	288.19 (212.87–398.06)	188 736 (119 496–309 965)	271.23 (172.15–441.53)	-0.06 (-0.34–0.26)		
Bhutan	0.455	814 (615–1067)	175.54 (132.78–230.05)	1072 (764–1474)	184.25 (132.46–253.15)	0.05 (-0.13–0.27)	612 (416–836)	254.70 (171.66–346.08)	774 (504–1094)	261.11 (167.93–370.95)	0.03 (-0.16–0.24)		
Cambodia	0.469	52 251 (43 259–63 797)	579.09 (482.12–712.77)	76 026 (58 767–94 334)	606.82 (473.95–750.69)	0.05 (-0.14–0.25)	38 540 (30 944–48 299)	1042.53 (846.07–1334.54)	54 880 (42 147–69 438)	1062.37 (817.66–1358.8)	0.02 (-0.17–0.23)		
Democratic People's Republic of Korea	0.558	205 141 (15 4525–270 707)	735.45 (556.37–962.31)	235 437 (177 717–306 193)	712.30 (539.32–920.19)	-0.03 (-0.18–0.15)	141 800 (99 397–197 104)	1220.58 (876.92–1666.88)	161 707 (113 816–221 451)	1126.86 (815.69–1514.4)	-0.08 (-0.22–0.11)		
India	0.566	1 584 205 (1 461 551–1 723 380)	174.72 (161.5–190.55)	2 275 225 (1 871 750–2 691 295)	190.16 (156.64–224.66)	0.09 (-0.1–0.28)	1 196 732 (1 083 500–1 322 202)	268.48 (242.68–296.34)	1 586 070 (1 233 846–1 950 175)	271.30 (211.91–331.81)	0.01 (-0.21–0.26)		
Kyrgyzstan	0.596	12 824 (12 251–13 377)	341.57 (326.42–356.36)	15 377 (13 279–17 539)	308.12 (266.83–350.84)	-0.10 (-0.22–0.03)	9999 (9501–10 474)	606.25 (576.85–634.81)	11 721 (10 038–13 425)	532.34 (460.12–608.84)	-0.12 (-0.25–0.01)		
Lao People's Democratic Republic	0.49	19 739 (14 969–25 758)	559.56 (428.19–720.42)	26 518 (19 142–35 092)	566.50 (418.1–736.93)	0.01 (-0.18–0.24)	14 738 (10 766–19 870)	883.09 (657.67–1187.77)	19 216 (13 684–25 262)	861.29 (624.09–1112.8)	-0.02 (-0.22–0.21)		
Maldives	0.562	416 (373–462)	208.86 (186.77–232.2)	620 (511–742)	199.38 (163.94–237.7)	-0.05 (-0.22–0.15)	322 (283–365)	302.61 (266.27–343.46)	478 (389–577)	283.47 (229.69–342)	-0.06 (-0.25–0.14)		
Mongolia	0.606	11 716 (9652–14 055)	732.13 (605.83–866.62)	17 529 (13 389–23 176)	727.67 (568.02–941.27)	-0.03 (-0.2–0.21)	9349 (7605–11 305)	1325.52 (1092.98–1580.67)	14 013 (10 355–18 720)	1335.28 (1008.65–1737.42)	0.01 (-0.22–0.3)		
Myanmar	0.521	216 064 (156 726–309 983)	570.40 (419.32–806.31)	271 546 (199 769–374 583)	556.09 (409.15–761.85)	0.13 (-0.12–0.41)	150 353 (99 360–240 211)	892.47 (598.49–1412.17)	184 512 (129 789–274 994)	864.98 (613.93–1280.98)	-0.03 (-0.22–0.23)		

TABLE 7 (Continued)

Location	SDI 2019 lower		Male											
			Both				2019				2010			
			Number	ASR per 100 000 (95% CI)	Number	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)	Number	ASR per 100 000 (95% CI)	Number	ASR per 100 000 (95% CI)	Number	ASR per 100 000 (95% CI)	% change 2010–2019 (95% CI)
Palestine	0.588	8584 (7778–9410)	469.81 (426.36–513.68)	14 203 (12 043–16 667)	546.36 (462.77–639.36)	0.01 (-0.19–0.24)	6760 (6054–7507)	814.71 (731.68–903.57)	11 162 (9466–13 136)	901.55 (768.02–1046.3)	0.11 (-0.09–0.33)			
Tajikistan	0.539	14 017 (12 126–16 132)	335.26 (288.52–387.58)	17 302 (13 763–21 772)	300.28 (243.87–374.01)	-0.01 (-0.22–0.27)	10 326 (8779–12 028)	505.89 (428.03–593.24)	11 831 (9318–15 154)	436.74 (347–555.17)	-0.14 (-0.34–0.11)			
Timor-Leste	0.514	2822 (1958–3735)	421.11 (297.78–553.99)	4104 (2888–5397)	479.52 (341.33–629.51)	-0.06 (-0.27–0.23)	2027 (1311–2748)	606.06 (395.2–815.78)	2894 (1898–3902)	682.80 (456.42–904.17)	0.13 (-0.13–0.45)			
Low SDI														
Afghanistan	0.343	31 563 (17 036–53 762)	299.90 (167.68–511.88)	44 553 (25 083–71 319)	302.57 (179.92–481.25)	0.01 (-0.18–0.3)	24 344 (12 063–45 437)	504.01 (257.6–947.67)	32 821 (17 512–57 862)	485.96 (274.05–844.56)	-0.04 (-0.21–0.25)			
Nepal	0.422	30 976 (22 476–41 114)	172.98 (126.4–228.16)	45 196 (32 343–59 231)	195.08 (139.51–253.47)	-0.23 (-0.38–0)	21 828 (15 924–29 084)	247.11 (181.42–327.39)	30 434 (21 678–39 516)	277.16 (198.22–357.17)	0.12 (-0.13–0.39)			
Pakistan	0.449	416 861 (321 808–524 148)	453.80 (350.78–567.63)	522 648 (400 317–680 663)	425.72 (327.1–550.78)	0.16 (-0.04–0.38)	359 222 (267 008–467 611)	749.59 (559.17–968.14)	436 968 (318 323–591 600)	689.89 (504.54–928)	-0.08 (-0.35–0.3)			
Yemen	0.412	26 197 (18 556–37 800)	253.64 (182.15–366.57)	36 208 (24 430–53 799)	248.83 (169.31–368.91)	-0.02 (-0.21–0.22)	20 790 (14 324–31 221)	405.89 (281.88–605.7)	27 748 (17 997–44 272)	393.94 (254.61–622.7)	-0.03 (-0.24–0.22)			
				Female										
				2019				2010						
Location				Number	ASR per 100 000	% change	Number	ASR per 100 000	Number	ASR per 100 000	% change			
				(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)			
High SDI														
Brunei Darussalam		0.823	772 (688–860)	706.37 (632.31–784.18)	1176 (980–1385)	730.80 (618.67–850.63)	0.03 (-0.13–0.21)							
Cyprus		0.841	1705 (1557–1871)	227.50 (208.32–250.03)	2178 (1844–2524)	219.18 (186.62–253.94)	-0.04 (-0.19–0.12)							
Israel		0.803	14 052 (13 208–14 792)	304.03 (286.9–319.84)	16 867 (15 241–18 355)	285.32 (258.62–310.37)	-0.06 (-0.14–0.03)							
Japan		0.87	349 587 (300 800–376 526)	225.99 (203.81–238.07)	381 197 (315 576–418 629)	210.56 (186.69–225.92)	-0.07 (-0.11–0.03)							
Kuwait		0.851	758 (688–827)	125.97 (113.8–137.54)	1278 (989–1618)	104.23 (82.26–130.24)	-0.17 (-0.34–0.03)							

(Continues)

TABLE 7 (Continued)

Location	SDI 2019	Female				% change 2010–2019
		2010		2019		
		Number	ASR per 100 000	Number	ASR per 100 000	
Qatar	0.83	295 (233–366)	241.22 (193.55–293.68)	572 (421–734)	220.52 (170.71–275.17)	-0.09 (-0.27–0.13)
Republic of Korea	0.878	92 714 (85 603–98 182)	263.26 (242.92–278.73)	118 396 (104 054–131 119)	245.25 (216.78–270.42)	-0.07 (-0.15–0.02)
Saudi Arabia	0.805	7733 (6645–8978)	123.21 (107.08–140.84)	12 650 (9344–16 468)	127.19 (95.79–162.81)	0.03 (-0.2–0.31)
Singapore	0.861	8499 (7891–9022)	318.79 (295.34–338.85)	11 125 (9748–12 390)	277.03 (242.91–308.51)	-0.13 (-0.22–0.04)
Taiwan (Province of China)	0.868	70 474 (65 968–73 910)	451.64 (421.7–473.69)	93 900 (73 474–120 865)	457.18 (355.86–591.97)	0.01 (-0.21–0.31)
United Arab Emirates	0.88	1505 (1167–1859)	383.78 (305.93–468.78)	3292 (2254–4366)	274.87 (164.71–396.5)	-0.28 (-0.54–0.08)
High-middle SDI						
Bahrain	0.751	544 (472–629)	272.77 (237.79–315.2)	869 (682–1070)	238.46 (189.98–289.87)	-0.13 (-0.3–0.06)
Georgia	0.702	6452 (5824–7120)	208.47 (187.61–230.63)	6385 (5261–7673)	207.18 (170.33–250.11)	-0.01 (-0.2–0.23)
Jordan	0.731	2735 (2345–3161)	149.93 (128.73–173.63)	5578 (4366–7137)	161.92 (128.25–205.65)	0.08 (-0.15–0.37)
Kazakhstan	0.723	17 562 (16 578–18 646)	202.47 (191.3–214.83)	19 608 (16 256–23 097)	187.71 (156.51–220.87)	-0.07 (-0.24–0.1)
Lebanon	0.708	7722 (6511–9720)	350.95 (296.83–442.46)	10 949 (8038–14 776)	384.97 (281.37–520.49)	0.10 (-0.16–0.34)
Malaysia	0.737	29 244 (26 440–32 255)	291.69 (263.54–322.87)	36 772 (28 061–47 106)	266.48 (203.45–339.35)	-0.09 (-0.29–0.16)
Oman	0.783	803 (704–913)	157.82 (137.42–180.41)	1121 (800–1377)	141.83 (104.09–169.59)	-0.10 (-0.33–0.12)
Sri Lanka	0.69	13 033 (11 992–14 229)	119.16 (109.67–129.9)	18 254 (13 292–24 267)	128.58 (94.22–170.76)	0.08 (-0.21–0.43)
Turkey	0.748	85 158 (74 588–96 867)	233.33 (204.61–265.97)	117 955 (93 375–146 975)	250.26 (198.42–311.87)	0.07 (-0.17–0.4)

TABLE 7 (Continued)

Location	SDI 2019	Female			% change 2010–2019	
		2010		2019		
		Number	ASR per 100 000	Number		
Middle SDI						
Armenia	0.689	5548 (5221–5921)	263.73 (247.62–281.46)	5540 (4557–6581)	242.58 (198.59–288.26)	-0.08 (-0.25–0.11)
Azerbaijan	0.683	9643 (8400–11 193)	223.93 (194.18–258.94)	12 364 (9432–15 634)	222.46 (172.67–281.07)	-0.01 (-0.22–0.26)
China	0.686	3 956 613 (3 524 734–4 404 296)	500.77 (444.94–556.06)	5 160 817 (4 138 835–6 353 139)	492.17 (393.74–604.27)	-0.02 (-0.23–0.23)
Indonesia	0.66	299 009 (182 599–424 669)	315.66 (194.98–443.91)	407 620 (226 898–623 490)	339.17 (189.97–516.37)	0.07 (-0.17–0.39)
Iran (Islamic Republic of)	0.67	41 148 (39 261–43 163)	141.32 (134.22–148.3)	68 653 (62 555–74 042)	178.15 (161.41–192.43)	0.26 (0.13–0.37)
Iraq	0.671	16 598 (12 447–21 665)	183.06 (138.93–236.13)	31 249 (23 269–41 007)	239.59 (181.03–307.77)	0.31 (0.02–0.7)
Philippines	0.623	74 977 (66 626–84 617)	224.83 (200.27–253.9)	115 106 (86 753–150 100)	259.58 (197.49–336.23)	0.15 (-0.15–0.55)
Syrian Arab Republic	0.619	8304 (6706–10 155)	149.22 (121.78–178.86)	10 148 (6956–13 953)	155.27 (106.32–210.2)	0.04 (-0.25–0.4)
Thailand	0.687	145 242 (126 649–165 290)	357.80 (312.22–406.92)	176 154 (131 468–234 593)	321.69 (238.79–427.89)	-0.10 (-0.36–0.21)
Turkmenistan	0.67	1925 (1737–2120)	104.73 (94.93–115.65)	2880 (2203–3719)	122.63 (94.53–158.09)	0.17 (-0.09–0.48)
Uzbekistan	0.631	14 642 (13 757–15 641)	147.49 (139.11–156.73)	22 746 (18 516–27 581)	169.49 (140.38–203.1)	0.15 (-0.06–0.39)
Vietnam	0.617	121 151 (98 246–148 007)	298.72 (243.31–366.61)	177 929 (133 317–235 275)	325.27 (245.25–426.63)	0.09 (-0.15–0.37)
Low-middle SDI						
Bangladesh	0.483	32 752 (22 955–46 303)	73.08 (50.63–103.78)	57 053 (38 132–81 434)	85.35 (56.79–121.16)	0.17 (-0.11–0.48)
Bhutan	0.455	202 (130–335)	89.76 (58.16–148.43)	297 (194–475)	103.59 (68.51–165.05)	0.15 (-0.06–0.45)
Cambodia	0.469	13 712 (11 060–16 856)	255.02 (208.3–313.1)	21 146 (16 089–27 193)	290.69 (222–372.55)	0.14 (-0.08–0.4)

(Continues)

TABLE 7 (Continued)

Location	Female						% change 2010–2019
	SDI 2019	2010		2019		ASR per 100 000	
		Number	ASR per 100 000	Number	ASR per 100 000		
Democratic People's Republic of Korea	0.558	63 341 (46 751–80 830)	399.33 (295.05–507.97)	73 730 (52 217–98 877)	403.09 (281.86–545.06)	0.01 (-0.2–0.25)	
India	0.566	387 473 (337 962–432 534)	83.99 (73.01–93.81)	689 155 (533 934–873 541)	112.92 (87.71–142.75)	0.34 (0.02–0.71)	
Kyrgyzstan	0.596	2825 (2631–3014)	132.57 (123.23–141.85)	3656 (3012–4338)	133.43 (110.79–157.91)	0.01 (-0.17–0.19)	
Lao People's Democratic Republic	0.49	5000 (3744–7061)	262.98 (200.26–370.62)	7302 (5148–10 478)	292.87 (208.9–416.89)	0.11 (-0.11–0.37)	
Maldives	0.562	94 (81–107)	98.29 (84.75–112.82)	142 (114–174)	101.31 (81.22–123.74)	0.03 (-0.17–0.28)	
Mongolia	0.606	2366 (1928–2906)	279.40 (228.98–340.45)	3517 (2711–4617)	277.36 (216.31–357.36)	-0.01 (-0.23–0.26)	
Myanmar	0.521	65 711 (51 120–84 000)	311.66 (241.54–396.25)	87 034 (66 622–115 527)	318.70 (245.68–419.49)	0.02 (-0.17–0.26)	
Palestine	0.588	1824 (1606–2076)	178.40 (156.62–203.01)	3042 (2491–3666)	219.65 (178.84–265.01)	0.23 (-0.03–0.54)	
Tajikistan	0.539	3691 (3184–4273)	169.53 (146.33–196.93)	5470 (4327–6888)	175.30 (141.02–219.76)	0.03 (-0.19–0.33)	
Timor-Leste	0.514	795 (566–1252)	235.30 (171.45–374.02)	1210 (840–1736)	280.22 (196.83–400.22)	0.19 (-0.1–0.54)	
Low SDI							
Afghanistan	0.343	7220 (4658–10 796)	118.35 (81.42–170.34)	11 732 (7195–17 414)	139.69 (92.77–198.61)	0.18 (-0.09–0.51)	
Nepal	0.422	9148 (5909–13 668)	99.40 (62.82–149.13)	14 762 (9894–21 002)	119.79 (80.4–171.49)	0.21 (-0.06–0.57)	
Pakistan	0.449	57 638 (45 789–71 940)	128.42 (102.3–158.25)	85 679 (62 126–114 158)	141.81 (104.07–189.04)	0.10 (-0.18–0.51)	
Yemen	0.412	5407 (3996–7443)	98.81 (74.26–132.27)	8460 (5985–11 599)	107.43 (78.67–145.39)	0.09 (-0.2–0.38)	

Abbreviations: CI, confidence interval; DALYs, disability-adjusted life-years; SDI, sociodemographic index; TBL, tracheal, bronchial and lung.

a 5% decrease compared with 2010. Southeast Asian countries experienced a stable trend and South Asian countries experienced an increasing trend of 5%; other Asian countries experienced a decreasing trend from 2010 to 2019 (by 1%–14%) (Figure 3 and Table 1).

In men, the highest DALYs ASR of TBL was observed in East Asian countries (1195.54 [95% CI: 949.99–1478.03]); with a 6% decrease compared with 2010. Also, other Asian countries experienced a decreasing trend from 2010 to 2019 (by 1%–18%). High-income Asia Pacific countries experienced the highest decrease (Table 2).

In women, the highest DALYs ASR of TBL was observed in East Asian countries (489.73 [95% CI: 396.14–597.18]); with a 2% decrease compared with 2010. Also, high-income Asia Pacific countries experienced a decreasing trend from 2010 to 2019 by 7%. Other Asian countries experienced an increasing trend from 2010 to 2019 (by 1%–30%). South Asian countries experienced the highest decrease (Table 3).

Based on SDI

In 2019, among high SDI Asian countries, Brunei Darussalam (867.69) and Taiwan (Province of China) (638.74) had the highest DALYs ASR of TBL, and Saudi Arabia (208.01) had the lowest rate. Among high-middle SDI Asian countries, Georgia (828.59) and Turkey (814.58) had the highest DALYs ASR of TBL, and Oman (211.73) had the lowest rate. In middle SDI Asian countries, China (831.27) and Armenia (772.08) had the highest DALYs ASR of TBL, and Turkmenistan (265.85) had the lowest rate. Among low-middle SDI Asian countries, Mongolia (727.67) and the Democratic People's Republic of Korea (712.30) had the highest ASPR of TBL, and Bangladesh (181.71) had the lowest rate.

Among low SDI Asian countries, Pakistan (425.72) had the highest DALYs ASR of TBL, and Nepal (195.08) had the lowest rate. More details are presented in Table 7.

National comparison

Among Asian countries, 33 countries experienced a decreasing trend in the TBL cancer DALYs ASR between 2010 and 2019; the greatest increase was detected in Iraq (increase in DALYs ASR = 0.16 [95% CI: –0.05–0.42]) and the greatest decrease was detected in Oman (decrease in DALYs ASR = –0.23 [95% CI: –0.38–0]) (Figure 4).

In 2019, the highest DALYs ASR (per 100 000) of TBL cancer was reported in Brunei Darussalam (867.69), China (831.27), Georgia (828.59), Turkey (814.58), and Armenia (772.08). The lowest DALYs ASR of TBL cancer was reported in Bangladesh (181.71), Bhutan (184.25), India (190.16), Nepal (195.08), and Maldives (199.38).

In Asian men, the highest DALYs ASR (per 100 000) of TBL cancer was reported in Georgia (1623.55), Armenia (1456.82), Turkey (1431.86), Mongolia (1335.28), and China

(1203.78). The lowest DALYs ASR (per 100 000) of TBL cancer was reported in Saudi Arabia (260.49), Bhutan (261.11), Bangladesh (271.23), India (271.3), and Oman (274.3).

In women, the highest DALYs ASR (per 100 000) of TBL cancer was reported in Brunei Darussalam (730.8), China (492.17), Taiwan (Province of China) (457.18), Democratic People's Republic of Korea (403.09), and Lebanon (384.97). The lowest DALYs ASR (per 100 000) of TBL cancer was reported in Bangladesh (85.35), Maldives (101.31), Bhutan (103.59), Kuwait (104.23), and Yemen (107.43). Detailed results are presented in Table 7.

DISCUSSION

In this study, temporal trends of TBL cancer were estimated in 49 Asian countries and territories by geographical region and SDI and compared with the global data between 2010 and 2019. This study is the first in which calculated temporal trends of TBL cancer were estimated in Asian countries. The results showed that from 2010 to 2019 in the total population there was an over 1.34-fold increase in the number of TBL cancer incidences. Also, ASIR, ASDR, and ASPR decreased while the age-standardized DALY rate increased.

In 2019, more than half of TBL cancer cases (58%) occurred in Asian countries. However, during this period, the ASIR of TBL decreased by 1%. Also, the results of the study show that the number of TBL cancer increased more in women than in men so the number of TBL cancer cases in men increased 1.3-fold and in women 1.42-fold from 2010 to 2019. In men, the age group of 65–69 years had the higher number of TBL cancer, while in women, this number was greater in the age group of 70–74 years. Also, the ASIR decreased in men by 3% but in women increased by 5%.

In this period, ASIR decreased globally, in America and Europe in men but this index increased globally, in Europe, and Africa, and decreased in America in women.

The main risk factor is tobacco smoking; however, genetic sensitivity, unhealthy eating, occupational exposure, air pollution, chronic bronchitis, emphysema, tuberculosis, pneumonia, asthma, and environmental carcinogens (arsenic, asbestos, and radon) are other risk factors that can act independently, or together, with smoking.^{30,31} Another study in Europe showed that lung cancer rates were increasing in female smokers but decreasing in male smokers over time.³² Other studies reported that women who are heavy smokers had a higher risk of lung cancer than men.^{33,34} It has also been found that sex hormones can be associated with lung cancer.³⁵ However, gender differences are important and must be considered. For lung cancer, behavioral factors such as smoking and gender-related factors such as genetic susceptibility, exposure to sex hormones and molecular characteristics may increase a woman's susceptibility.^{36–38}

One of the modifiable risk factors is cigarette smoking and quitting smoking can reduce the risk of lung cancer by

up to 50% in 10 years.³⁹ Because TBL cancer risk factors have various distributions in different geographical areas, for the prevention of TBL cancer, first we must not only know the geographic and temporal patterns of lung cancer incidence and mortality but also the risk factors. Research on the risk factors must be done in different areas to focus intervention programs on dominant and important risk factors in each area. Since smoking is the most important risk factor for lung cancer, for effective prevention and management of lung cancer, the determination of the risk factors in smokers and nonsmokers should be a useful action. On the other hand, education, tax increase, and government legislation, such as prohibiting smoking and introducing packaging for cigarettes, can achieve better outcomes.⁴⁰

In 2019, the highest ASIR (per 100 000) of TBL cancer was reported in Brunei Darussalam, China, the Republic of Korea, Turkey, and Taiwan. The lowest ASIR of TBL cancer was reported in Bangladesh, India, Bhutan, Nepal, and Saudi Arabia. Deng et al. showed that the incident cases, deaths, and DALYs of TBL cancer in China growth ranged from 140% to 240%.⁴¹

According to the results in men and women, the highest number of TBL cancer deaths was in the age group of 70 to 74 years. The results of the study also showed that the number of TBL cancer deaths was higher in men than in women (1.28-fold vs. 1.4-fold). However, ASDR of TBL cancer in women increased by 2% but decreased in men by 6% from 2010 to 2019. Also in 2019, ASDR of TBL cancer in men was higher than in women. In the meantime, ASDR decreased globally, in America and Europe in men while this index was globally stable in women, but increased in Europe and Africa, and decreased in America. Zang et al. showed that at all levels of cigarette smoke exposure, women are consistently at a greater risk for developing major types of lung cancer than men.⁴² This difference between men and women is probably due to the greater susceptibility of women to tobacco carcinogens.⁴³ Other studies in developed countries consistent with this study showed that lung cancer mortality has increased rapidly in women, while it has remained constant or decreased in men.^{44,45} It should be noted that the risks and pathophysiology of lung cancer in nonsmoker women are different compared to nonsmoker men. In Asia, 60%–80% of women with lung cancer have never smoked, while 10%–15% of men with lung cancer have never smoked.^{46,47}

In this study, the prevalence of TBL cancer was also assessed. According to the results, from 2010 to 2019 the prevalence of TBL cancer increased in men by 1.36-fold and women by 1.36-fold. In 2019, the prevalence of TBL cancer was approximately 57% in Asian countries. During this period, the ASPR of TBL cancer increased by 4% in men. This increase was higher (10%) in women. Also, in this period in men, ASPR decreased globally, in America and Europe and in women, this index increased globally, in Africa, and Europe; while decreasing in American countries. As the ASIR decreased in men and increased in women within this period, the ASPR increased more in women than

in men (10% vs. 2%). However, there is no information about the duration of TBL cancer in men and women. In the meantime, the survival rate of TBL cancer should also be considered. Cao et al. showed that the survival rate of lung cancer is higher in women (47.3% vs. men 29.3%).⁴⁸ Therefore, the higher survival rate of TBL cancer in women may be one of the reasons for the increased ASPR in this group.

The results showed that in this period, the number of DALY of TBL cancer in men and women increased 1.23- and 1.34-fold, respectively. However, the age-standardized DALY rate in men decreased by 7% and in women increased by 1%. In men, the age-standardized DALY rate decreased globally, in America, Europe, and Africa and women this index decreased globally and in America, but increased in Africa and was stable in Europe. Other studies showed that due to the improvement of lung cancer treatment worldwide, the age-standardized DALY rate of TBL cancer decreased in men and women.^{49,50} TBL cancer is still considered an important public health burden as the survival rate of this cancer is quite poor.⁵¹ As a consequence, early screening and detection have a major role in decreasing TBL mortality.^{52,53} According to the American Cancer Society recommendations, for people aged 55–74, low-dose helical computed tomography (LDCT) should be done for the annual screening of lung cancer. As shown by screening programs, the incidence and mortality of lung cancer have significantly decreased.^{54,55} Due to differences in equipment, resources, and skill of personnel, early detection rates differ, and to improve the detection rate, skilled personnel as well as the latest tools and equipment must be used.

In conclusion, most of the global burden of lung cancer occurs in Asian countries, and the decreasing trend of incidence, death, prevalence, and burden of this cancer in these countries is slower than in other regions. Therefore, the implementation of necessary measures to reduce the process of this cancer is considered urgent. These plans should include reducing the risk factors exposure, starting or expanding the screening and diagnostic programs especially for high-risk smoker men, and expanding treatment procedures.

As online data were used in this study, the possibility of errors in the stored data is a major limitation of the study, such as problems of quantifying all sources, delays in accessing data, and changes in coding practices over time, gaps in reliable cancer reporting, and registries in low-SDI countries.

AUTHOR CONTRIBUTIONS

HS, AM, FR and LA designed and conceived the study. AM collected the data. LA, AM, HS, and FR analyzed and interpreted the data. AM, AR, FR, LA, and HS, drafted the manuscript. HS, FR and AM provided administrative, technical, or material support. All authors contributed to the article and approved the submitted version.

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How to cite this article: Rezaei F, Mazidimoradi A, Rayatinejad A, Allahqoli L, Salehiniya H. Temporal trends of tracheal, bronchus, and lung cancer between 2010 and 2019, in Asian countries by geographical region and sociodemographic index, comparison with global data. *Thorac Cancer*. 2023;14(18):1668–706. <https://doi.org/10.1111/1759-7714.14912>