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Research Article

Keywords: Ovarian cancer, Global burden disease, Incidence, Prevalence, Trends, DALYs, SDI

Posted Date: August 8th, 2025

DOI: https://doi.org/10.21203/rs.3.rs-7031267/v1

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Additional Declarations: No competing interests reported.

Epidemiological Shifts in Ovarian Cancer Burden: Regional Differences and the Influence of Socioeconomic Factors

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Abstract

Ovarian cancer remains a critical global health challenge, ranking eighth in incidence and accounting for 3.4% of new cancer cases and 4.8% of cancer deaths in 2022. Using GBD 2021 data (204 countries, 1990–2021), we assessed age-standardized incidence, prevalence, and DALYs against SDI. Incident cases nearly doubled (159 096→298 876), yet ASRs declined by 0.38% (incidence), 0.07% (prevalence) and 0.59% (DALYs) per year. Regional trends diverged—Andean Latin America saw the largest ASR increase; Australia experienced the steepest decline. High-SDI regions maintained the highest burden but showed sustained declines, whereas low- and middle-SDI regions saw rising rates. Population growth (86.7%) and aging (38.5%) drove DALY increases. Despite narrowing inequalities, the absolute burden persists, highlighting the need for precision detection in high-SDI settings and strengthened care in lower-SDI regions.

Keywords: Ovarian cancer; Global burden disease; Incidence; Prevalence; Trends; DALYs; SDI

Introduction

Globally, ovarian cancer (OC) is the eighth most commonly diagnosed malignancy in women, accounting for an estimated 3.4 % of all new female cancer cases and 4.8 % of cancer deaths in 2022—roughly 300 000 incident cases and 200 000 deaths [1]. Early detection remains elusive because the disease seldom produces specific symptoms at its incipient stage and no reliable, non-invasive screening test exists. Consequently, most patients are diagnosed with advanced-stage disease, for which prognosis is poor [2]. Current first-line management for advanced OC involves cytoreductive surgery followed by platinum- and taxane-based neoadjuvant or adjuvant chemotherapy [3,4]. Despite incremental advances, the five-year survival rate has plateaued at about 35–40 %, largely owing to the emergence of platinum resistance [5].

The epidemiology of OC is shaped by a constellation of factors: lifestyle exposures (e.g., smoking, obesity, prolonged sedentary behaviour), reproductive and hormonal influences (nulliparity, hormone-replacement therapy), and inherited susceptibility—most notably germline BRCA1/2 mutations [6]. The prevalence and impact of these determinants vary substantially across regions and populations [7], underscoring the need for targeted prevention strategies. A refined understanding of geographic and population-specific patterns can guide more tailored screening policies, early-detection approaches and personalised treatment, ultimately improving outcomes and easing the global burden of the disease [8].

The Global Burden of Disease (GBD) 2021 study—the latest update to GBD 2019—offers comprehensive epidemiological estimates for 371 diseases and 88 attributable risk factors across 204 countries and territories from 1990 to 2021 [9]. Leveraging these data, we examined temporal trends in OC incidence, mortality and disability-adjusted life-years (DALYs) over the past three decades, and explored their relations with the Sociodemographic Index (SDI). Our findings provide an evidence base for gauging global and regional OC burden and can assist policymakers in designing context-specific public-health interventions to meet the needs of their populations.

Method and Materials

Data sources

We retrieved data on ovarian-cancer prevalence, incidence, deaths and disability-adjusted life-years (DALYs) for 1990–2021 from the Global Burden of Disease 2021 database (https://ghdx.healthdata.org/gbd-2021). For each measure we extracted both the absolute numbers and the corresponding age-standardised rates (ASRs).

Socio-economic development was captured with the Sociodemographic Index (SDI)—a composite indicator (range 0–1) derived from the total fertility rate under 25 years, mean years of schooling in those aged ≥15 years, and lag-distributed income

per capita. On the basis of SDI values, the 204 countries and territories were classified into five categories: low, low-middle, middle, high-middle and high SDI. Because only de-identified, publicly available data were used, neither ethical approval nor informed consent was required.

Quantification and statistical analysis

All estimations derived from the GBD 2021 study were evaluated, accompanied by a 95% uncertainty interval (UI). Age-standardized rates (ASRs, per 100,000 population), including age-standardized prevalence rate (ASPR), age-standardized incidence rate (ASIR), age-standardized mortality rate (ASMR), and age-standardized disability-adjusted life years rate (ASDR), were calculated based on the following formula [10].

$$ASR = \frac{\sum_{i=1}^{A} a_i w_i}{\sum_{i=1}^{A} w_i} \times 100000$$

In this equation, a_i denoted the age specific rate of age group i in the population, w_i was the number of persons in the age group i. ASRs manifested the more precise epidemiological assessments by accounting for variations in age structures. The trends in ASRs can effectively serve as reliable indicators of diseases change, as supported by previous literatures. We computed the estimated annual percentage change (EAPC) and average annual percentage change (AAPC) of ASRs to assess these trends. The supposition was a linear correspondence between the natural logarithm of ASRs and temporal progression. This relationship was encapsulated by the following equation.

$$Y = \alpha + \beta X + \varepsilon$$

Y represented ln (ASR), X symbolized the year, and ε was synonymous with the error term. The EAPC was ascertained as $100\times(\exp(\beta)-1)$, while the 95% confidence interval (CI) was deduced concomitant with this linear regression framework. The joinpoint analysis was conducted to determine the annual percentage change (APC) and the correlated 95% CI, utilizing the Joinpoint software (version 4.9.1.0, https://surveillance.cancer.gov/joinpoint/). The equation used to calculate AAPC was set as follows,

$$AAPC = \left\{ \exp\left(\frac{\sum w_i b_i}{\sum w_i} \right) \right\} \times 100$$

where b represented the coefficient for the segment, w_i denoted the length of the segment, i referred to the specific ith segment.

Descriptive analysis

To derive a comprehensive understanding in the burden of OC, a descriptive analysis was performed at global, regional, and national levels. The global case number, crude rate, and age-standardized rate (ASR) of incidence, prevalence, and DALYs for OC in females from 1990 to 2021 were visually illustrated. Moreover, the case number and

ASR of incidence, prevalence, and DALYs for OC in females in 1990 and 2021 were compared at global, regional (20 GBD geographical regions), and national (204 countries and territories) levels, as well as 5 SDI quintiles (high, high-middle, middle, low-middle, low).All data utilized in the descriptive analysis were subjected to statistical analysis utilizing R software (version 4.2.3).

Decomposition analysis

A decomposition analysis, inspired by Das Gupta's methodology, was employed to deepen the understanding of discrepancies in disease burden [11].This methodology ascribed variations in DALYs to the combined influences of three elements, such as epidemiological changes, population aging, and population size. Pearson's correlation analysis was conducted to evaluate the interrelation between the ASRs estimates and SDI in 2021. All statistical visualizations and computations were conducted using the R software (Version 4.2.3).

Cross-country inequality analysis

To quantify relative inequality in the ovarian-cancer burden we used the concentration index as defined by the World Health Organization. Countries and territories were ranked by their SDI value, and for each year we plotted the cumulative share of the global population (x-axis) against the corresponding cumulative share of incidence, prevalence or DALYs (y-axis) to generate Lorenz curves. The concentration index (C) was calculated as

$$C = 2\int_0^1 [L(p) - p]dp$$

where L(p) denotes the Lorenz curve and p the cumulative population proportion. Numerically, the integral was approximated by trapezoidal summation. C ranges from –1 to +1: positive values indicate a greater burden in higher-SDI jurisdictions, negative values the opposite, and zero denotes perfect equality. We computed C annually from 1990 to 2021 for all 204 countries and territories to track temporal changes in cross-national health inequality.

Results

Descriptive analysis of OC burden at global, regional, and national levels

From 1990 to 2021, the absolute number and crude rate of OC incidence, prevalence and DALYs rose sharply worldwide, whereas the ASR of incidence and DALYs declined and the ASR of prevalence increased initially before falling (Figure S3; Tables 1–3). In 1990, Western Europe recorded the greatest counts of incident and prevalent cases and DALYs, while Australasia showed the highest ASR of incidence, prevalence and DALYs; by 2021, South Asia bore the largest absolute burden, whereas Central Europe had the highest ASR of incidence and DALYs and South-East Asia had the highest ASR of prevalence. Nationally, China contributed the most incident and prevalent cases and DALYs in 2021, the United Arab Emirates led in the ASR of incidence and DALYs, and Seychelles ranked first for the ASR of prevalence

(Figure 1; Tables S1–S3). When stratified by Sociodemographic Index, countries in the middle-SDI quintile experienced the largest absolute numbers of incident and prevalent cases and DALYs, yet the high-SDI quintile exhibited the highest ASR of incidence, prevalence and DALYs (Tables 1–3).

Overall trends in OC burden using broad estimation method

Globally, the ASR of incidence, prevalence and DALYs for OC fell between 1990 and 2021 at mean annual rates of -0.38 % (95 % CI -0.43 to -0.32), -0.07 % (95 % CI -0.13 to 0) and -0.59 % (95 % CI -0.64 to -0.54), respectively (Tables 1–3). Regionally, Andean Latin America recorded the largest annual increases in each ASR, whereas Australasia showed the steepest declines. At the national level, estimated annual percentage change (EAPC) varied widely across the 204 countries and territories: Ecuador exhibited the greatest positive EAPC for the ASR of incidence, prevalence and DALYs; Australia the greatest negative EAPC for the ASR of incidence and DALYs; and Sweden the greatest negative EAPC for the ASR of prevalence (Fig. 1; Tables S1–S3). When stratified by Sociodemographic Index, the low-middle SDI quintile showed the most pronounced increases in all three ASRs, while the high and high-middle SDI quintiles experienced sustained declines; middle, low-middle and low SDI groups all displayed upward trends during the study period (Tables 1–3).

Local trends in OC burden using joinpoint regression analysis

As illustrated in Fig. 2, join-point regression revealed marked temporal heterogeneity in the ovarian cancer (OC) burden between 1990 and 2021. Although the overall burden increased over the past three decades, the magnitude and direction of change differed by indicator. The incidence curve contained three statistically significant join-points: an initial rise from 1990 to 1995, a modest decline from 1995 to 2002, a pronounced decrease from 2002 to 2015, and a subsequent plateau from 2015 to 2021. Prevalence exhibited five inflection points, climbing during 1990–1995 and again during 1998–2002, followed by a sustained and significant downturn from 2002 to 2015. Disability-adjusted life-years (DALYs) showed four join-points, with a slight increase from 1990 to 1995, a sharp drop from 1995 to 1998, and a continued decline at varying rates from 2001 through 2021. Collectively, these findings underscore a complex, indicator-specific evolution of OC burden over time.

Age–period–cohort analysis of OC incidence and prevalence

The results of the age–period–cohort analysis for ovarian cancer (OC) incidence and prevalence are shown in Fig. 3. After adjusting for period and birth-cohort effects, age exerted a marked influence on risk. Relative incidence risk (RR) increased to a first peak in the 70–74 year group (RR = 2.001), declined, and then rose again in the 85–89 year group (RR = 2.018). In contrast, relative prevalence risk peaked earlier at 55–59 years (RR = 2.210), followed by a decline and a minor resurgence in the 80–84 year group (RR = 1.445) (Table 4).

After controlling for age and cohort effects, the period effect also had significant impacts on incidence and prevalence. Both risks rose modestly over time, with incidence and prevalence RRs increasing by 1.3-fold and 1.2-fold, respectively, from 1992 to 2017; the highest values for both were observed in 2017 (Table 4).

When age and period effects were held constant, the birth-cohort effect revealed a pronounced downward trend. Earlier cohorts bore higher risks than later ones, with incidence RR steadily falling to 0.608 in the 1987 cohort and prevalence RR declining to 0.789 in the 1972 cohort. Although overall risks continued to decline, incidence risk stabilised around RR ≈ 0.61–0.62 in the most recent cohorts (1992–2002), while prevalence risk showed a modest rebound from the 1977 cohort (RR = 0.806) to the 2002 cohort (RR = 0.900) (Table 4).

Several age, period, and cohort patterns in Fig. 3 differ from those in Figures S1 and S2, likely because the latter consider only pairwise interactions, leaving residual confounding by the third temporal dimension.

Decomposition analysis on OC DALYs

Over the past three decades, global DALYs have risen sharply, with the most pronounced increase occurring in the middle-SDI quintile (Fig. 4). Decomposition analysis shows that ageing, population growth, and epidemiological change contributed 38.51 %, 86.71 %, and –25.22 % to this overall rise, respectively. The high-SDI quintile registered the largest absolute influences for all three drivers—ageing (327.22 %), population growth (398.81 %), and epidemiological change (-626.04 %)—with each factor reaching its peak impact in this socioeconomic stratum (Table S4). Notably, the adverse (negative) effect of epidemiological change on DALYs was confined to the high and high-middle SDI quintiles, with the high-SDI group showing the greatest negative shift.

Relationship of SDI and OC burden

The Socio-demographic Index (SDI) is a composite metric that integrates income per capita, mean years of schooling, and total fertility rate, yielding values from 0 (lowest development) to 1 (highest development). This index is widely employed by researchers and policymakers to compare disease burdens across populations and to identify disparities in healthcare access and outcomes.

The present study covered 204 countries grouped into 20 geographic regions and assigned to one of five SDI categories, revealing marked heterogeneity in disease-burden trajectories across SDI strata (Fig. 5). From 1990 to 2021, age-standardised incidence, prevalence, mortality, YLLs, YLDs, and DALYs for ovarian cancer (OC) all followed an inverted-U pattern across the five SDI groups: rates were lowest at the extremes of SDI and peaked in the upper-middle tier (SDI ≈ 0.7–0.8). As SDI increased, each indicator changed significantly ($P < 0.001$). Specifically, SDI displayed a moderate positive correlation with age-standardised

incidence, mortality, DALYs, and YLLs, and a stronger positive correlation with age-standardised prevalence and YLDs.

Regionally, with the exception of the High-income Asia–Pacific area, all high-SDI regions exhibited elevated age-standardised incidence, whereas low-SDI regions—such as Western Sub-Saharan Africa—recorded the lowest rates. Globally in 2021, age-standardised incidence, prevalence, mortality, YLLs, YLDs, and DALYs first rose with SDI, dipped slightly, rose again to a peak, and then declined, mirroring the overall inverted-U relationship.

Cross-Country Inequality Analysis

Countries in the higher SDI strata bore a greater relative inequality in ovarian-cancer burden in both 1990 and 2021, yet these gaps narrowed markedly over time. The healthy concentration index (HCI) for incidence fell from 0.25 (95 % CI: 0.22–0.29) in 1990 to 0.05 (95 % CI: 0.02–0.08) in 2021. A similar decline was seen for prevalence, with the HCI decreasing from 0.31 (95 % CI: 0.27–0.34) to 0.11 (95 % CI: 0.08–0.14). For DALYs, the HCI dropped from 0.22 (95 % CI: 0.19–0.25) to 0.01 (95 % CI: -0.02–0.04). In every case, the HCI values diminished (Fig. 6), indicating a substantial reduction in relative inequality across SDI groups.

Discussion

This study provides up-to-date global, regional, and national estimates of ovarian-cancer (OC) incidence, prevalence, and DALYs for 1990–2021, complemented by integrated analyses of trends, decomposition, and inequality. Worldwide, incident OC cases nearly doubled—from 159 096 in 1990 to 298 876 in 2021—largely reflecting population growth, population ageing, and advances in diagnostic practice. Although countries differed in absolute rates, the overall OC burden—in incidence, prevalence, and DALYs—increased throughout the study period. Decomposition analysis pinpointed demographic expansion and ageing as the principal drivers of this rise. Cross-national inequality analysis showed that high-SDI countries bore a larger relative burden in both 1990 and 2021, yet these disparities narrowed markedly over time. Crucially, even though age-standardised rates of incidence, prevalence, and DALYs have declined slightly each year, the absolute number of cases is projected to keep climbing, signalling formidable challenges for OC prevention and management in the coming decades.

The age-standardised incidence rate (ASIR) of OC has declined globally, with high-SDI regions contributing most to this reduction. By contrast, ASIRs in middle-, lower-middle-, and low-SDI regions have continued to rise, consistent with earlier reports [12]. Our findings confirm that OC incidence varies geographically and is positively correlated with SDI [13]. Diminished breastfeeding, infertility or nulliparity, hormone therapy, obesity, and diabetes are well-established OC risk factors [14-18], whereas oral contraceptive use, pregnancy, and breastfeeding confer protection [6,19].

The high incidence observed in Central, Eastern, and Western Europe may reflect the distribution of these factors.

Age, period, and cohort (APC) effects provide complementary perspectives on temporal change [20]. We observed a multi-phase trajectory in relative incidence risk, which increased with age and peaked at 85–89 years. This differs from an earlier GBD-2021 analysis that reported the highest incidence in the 45–49 year group—probably because that study's upper age band ended at 45–49 years [21]. Individuals in this later-life band therefore warrant targeted prevention, management, and treatment. Nevertheless, because the relative incidence risk remains above 1.0 from 45 years onward, OC-related health-education programmes should begin no later than age 45.

Relative prevalence risk rose and then fell, peaking at 55–59 years, with a minor resurgence at 80–84 years—again diverging from GBD-2021 findings that showed a peak at 45–49 years [21]. Period effects revealed rising relative risks for both incidence and prevalence, possibly reflecting dietary shifts and improved detection via CT, ultrasound, MRI, and other modalities [22]. Cohort effects indicated higher incidence and prevalence in earlier birth cohorts, with incidence risk ratios falling continuously until the 1987 cohort and prevalence risk ratios until the 1972 cohort. These trends may stem from greater lifetime exposure to risk factors among earlier cohorts and broader health-education coverage and medical access among more recent cohorts, which together mitigate OC risk in younger generations.

This study draws on the Global Burden of Disease (GBD) database, providing a comprehensive overview of the global OC burden. The GBD dataset encompasses 204 countries and regions and employs standardized statistical methods that ensure cross-regional comparability. By applying multiple statistical techniques—Joinpoint regression, age-period-cohort (APC/AAPC) analysis, decomposition analysis, and health-inequality assessment—our study evaluates OC incidence, prevalence, and DALYs from several angles, enabling multi-dimensional validation of the results.

Compared with traditional disease-burden studies, the GBD database offers superior data quality and coverage. Its estimates are generated through extensive international collaboration, ensuring high representativeness and accuracy. Moreover, Joinpoint and APC/AAPC models effectively capture time-series trends, accurately depicting changes in OC burden at global, regional, and national levels.

Nonetheless, the GBD database has limitations. First, regional data gaps and incomplete reporting—particularly in low- and middle-income settings—can reduce estimate accuracy. For example, remote areas with limited medical resources may register lower OC detection rates, leading to incidence underestimation. Second, the statistical assumptions and breakpoint selection in Joinpoint and APC/AAPC models may influence precision; inappropriate model choices could mask significant

spatiotemporal differences in OC burden. Future research should integrate more granular, multi-source data for cross-validation and consider advanced data-fusion approaches, such as combining spatial transcriptomics with environmental factors [23]. Continuous global data sharing and improved medical infrastructures could also supply real-time, high-quality data to bridge current GBD gaps [24].

Rapid progression to middle-SDI status is often accompanied by less healthy lifestyles and expanded screening, both of which can elevate incidence. In contrast, high-SDI regions tend to exhibit healthier behaviours and more effective preventive programmes, which may lower female cancer incidence [25]. Apparent "low burden" in low-SDI settings is usually artefactual: inadequate infrastructure, limited specialist services, and outdated technology increase the risk of misdiagnosis or under-diagnosis, thereby underestimating true burden [26-28]. In our study, for instance, Australasia recorded the largest decline in age-standardised OC incidence between 1990 and 2021, whereas Andean Latin America showed the steepest rise.

From 1990 to 2021, inequality analyses revealed a shift in OC burden from high-SDI groups toward a more even distribution; the concentration index fell, indicating greater equity. This improvement may reflect targeted governmental measures (e.g., screening campaigns or cost-free treatment in low-SDI areas) alongside gains in education, narrower income gaps, and better healthcare access.

These findings provide important guidance for clinical screening, early diagnosis, and treatment strategies. High-income, high-SDI countries—despite advanced healthcare systems—face rising OC burdens, underscoring the need for more robust early-screening and diagnostic strategies. Strengthening surveillance and health education among high-risk groups could markedly reduce OC incidence and mortality [29]. For low- and middle-income countries, public-health policies should emphasise expanding primary care, improving women's health awareness, and optimising resource allocation [30]. High-SDI nations should prioritise precision screening and treatment, whereas lower-SDI regions require enhanced health education and diagnostic infrastructure [31]. Globally, OC interventions must focus on gender equity and healthcare accessibility, especially for vulnerable populations [32].

At present, many trials have yet to identify reliable biomarkers capable of predicting which women in the general population will develop ovarian cancer [33]. Elucidating the biological mechanisms underlying the observed epidemiological trends—and their interaction with socio-economic determinants—will require cross-national collaboration and the use of large, international data platforms for detailed molecular epidemiology. Such efforts are essential for designing age-, region- and subtype-specific strategies for primary prevention, early detection and clinical care.

Limitation

Several limitations must be considered when interpreting the findings of this study. First, the reliance on the GBD 2021 database introduces potential biases, as data from low- and middle-income countries are often sparse or incomplete. This can lead to underestimation of the true ovarian cancer burden in these regions, where limited healthcare infrastructure may result in lower detection rates. Second, while the study employed sophisticated statistical models such as Joinpoint regression and APC/AAPC analysis, the choice of statistical assumptions and breakpoints could impact the precision of the estimates, potentially masking significant regional variations in ovarian cancer incidence and burden. Third, cross-national differences in diagnostic criteria, screening practices, and reporting standards may reduce the comparability of burden estimates across countries, complicating global assessments. Fourth, the study is based on observational data, which limits the ability to establish causal relationships between risk factors and ovarian cancer incidence. The complex interplay of genetic, lifestyle, and environmental factors remains underexplored, and future studies incorporating multi-level data could provide more accurate insights into the etiological pathways of ovarian cancer. Finally, although the GBD dataset is widely regarded for its robustness, future research would benefit from the integration of more granular, real-time data from diverse sources, including genomic data and environmental exposures, to refine the understanding of ovarian cancer trends and improve the accuracy of global health assessments.

Conclusion

From 1990 to 2021, the global burden of ovarian cancer rose steadily, with the most rapid acceleration occurring in the early 2000s. Women were disproportionately affected. Demographic expansion—especially population growth and population ageing—was the dominant driver, and case numbers are projected to climb further in coming decades. High-SDI countries currently shoulder the heaviest burden, and cross-national disparities in health-care resources are widening.

These trends pose a dual public-health challenge: health systems must expand early-detection programmes and precision-treatment capacity while simultaneously reallocating resources to curb inequality. Targeted interventions are therefore essential—high-SDI countries should continue to invest in advanced medical technologies, whereas low-SDI countries need strengthened primary-care and diagnostic infrastructure. Only by addressing both fronts can the global community achieve equitable and efficient ovarian-cancer control.

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Declarations

Ethics approval and consent to participate

Not Applicable.

Availability of data and materials

The data used for the analyses in the study are publicly available at https://ghdx.healthdata.org/gbd-2021.

Consent for publication

Not Applicable.

Clinical trial number

Not applicable.

Competing Interests

The authors declare no conflicts of interest.

Funding

This work was supported by the Fundamental Research Funds for the Central Universities of Central South University (Grant Nos. CX20240300).

Author Contributions

M.M.L. and J.F.Z. conceptualized and supervised the project and administered its execution. C.L. developed the methodology, performed software implementation, data

curation, formal analysis, and validation. C.L. and X.L.L. jointly carried out investigation and acquired resources. X.L.L. prepared the original draft, conducted visualization, and led review and editing. C.L. and X.L.L. secured funding. All authors reviewed and approved the final manuscript.

Acknowledgements
We would like to express our sincere gratitude to all the authors and collaborators of the Global Burden of Disease (GBD) Study for their remarkable efforts in quantifying and analyzing the global disease burden. Their rigorous work and dedication have provided the global health community with a uniquely comprehensive and high-quality dataset, without which our research would not have been possible. The GBD Study serves as an indispensable reference for advancing evidence-based global health strategies and research.We also thank Dr. Mingmei Liao for her leadership, coordination, and significant contributions throughout the research process.

Figure Legends

Figure 1. Global age-standardized rates of ovarian cancer burden in 2021 and temporal trends from 1990 to 2021. (A) The ASR of incidence in 2021; (B) The trend in ASR of incidence (EAPC) from 1990 to 2021; (C) The ASR of prevalence in 2021; (D) The trend in ASR of prevalence (EAPC) from 1990 to 2021; (E) The ASR of DALYs in 2021; (F) The trend in ASR of DALYs (EAPC) from 1990 to 2021; of OC worldwide. Abbreviations: ASR, age-standardized rate; EAPC, estimated annual percentage change; DALYs, disability-adjusted life-years; OC, ovarian cancer.

Figure 2. Joinpoint regression–identified inflection points in global ovarian cancer age-standardized incidence, prevalence, and DALY rates from 1990 to 2021. (A) Joinpoint regression analysis of incidence rates; (B) Joinpoint regression analysis of prevalence rates; (C) Joinpoint regression analysis of DALYs rates; of OC globally. Abbreviations: ASR, age-standardized rate; DALYs, disability-adjusted life-years; OC, ovarian cancer.

Figure 3. Age–period–cohort modelled relative risks for ovarian cancer incidence and prevalence. The effects of age, period, and birth cohort on the relative risk of OC incidence (A) and prevalence (B). Abbreviations: OC, ovarian cancer.

Figure 4. Decomposition of global ovarian cancer DALYs changes from 1990 to 2021 by population growth, population aging, and epidemiological shifts across SDI quintiles. Changes in DALYs of OC according to aging, population growth and epidemiological change from 1990 to 2021 at global level by SDI quintile. The black dot denotes the overall value of the change resulting from all three components. For each component, the magnitude of a positive value suggests a corresponding increase

in OC DALYs attributed to the component; the magnitude of a negative value suggests a corresponding decrease in OC DALYs attributed to the component. Abbreviations: DALYs, disability-adjusted life-years; OC, ovarian cancer; SDI, sociodemographic index.

Figure 5. Trends in age-standardized ovarian cancer incidence, prevalence, mortality, DALYs, YLDs and YLLs across 20 GBD regions by SDI quintile, 1990–2021 (black line denotes SDI-based expected values). (A) Incidence; (B) Prevalence; (C) Deaths; (D) DALYs; (E) YLDs; (F) YLLs.Black line: SDI-based expected values.Abbreviations:OC, ovarian cancer;GBD,Global Burden of Diseases, Injuries, and Risk Factors Study;DALYs,disability-adjusted life-years; YLDs, years lived with disability;YLLs,years of life lost;OC, ovarian cancer.

Figure 6. Global age-standardized ovarian cancer rates in females for 2021. (A) Incidence, (B) Prevalence, (C) Deaths, (D) DALYs, (E) YLDs, (F) YLLs across 204 countries and territories.Each point shows the observed age-standardized rates for a specified country or territory in 2021. The black line indicates the expected values based on the sociodemographic index and disease rates in all locations.Abbreviations: DALYs, disability-adjusted life-years; YLDs, years lived with disability; YLLs, years of life lost; OC, ovarian cancer; SDI, Sociodemographic Index.

Figure 7. Sociodemographic index–related concentration curves depicting health inequalities in ovarian cancer burden from 1990 to 2021. (A) incidence, (B) prevalence, and (C) DALYs.
Abbreviations: DALYs, disability-adjusted life-years; OC, ovarian cancer; SDI, Sociodemographic Index.

Table Captions

Table 1
Global and regional incidence of OC in 1990 and 2021, and EAPC of ASR from 1990 to 2021.

Table 2
Global and regional prevalence of OC in 1990 and 2021, and EAPC of ASR from 1990 to 2021.

Table 3
Global and regional DALYs of OC in 1990 and 2021, and EAPC of ASR from 1990 to 2021.

Table 4
RRs of OC incidence and prevalence due to age, period and birth cohort effects.

Supplemental Information

Document S1. Table S1-S4

Document S2. Figures S1-S3

Figure 1

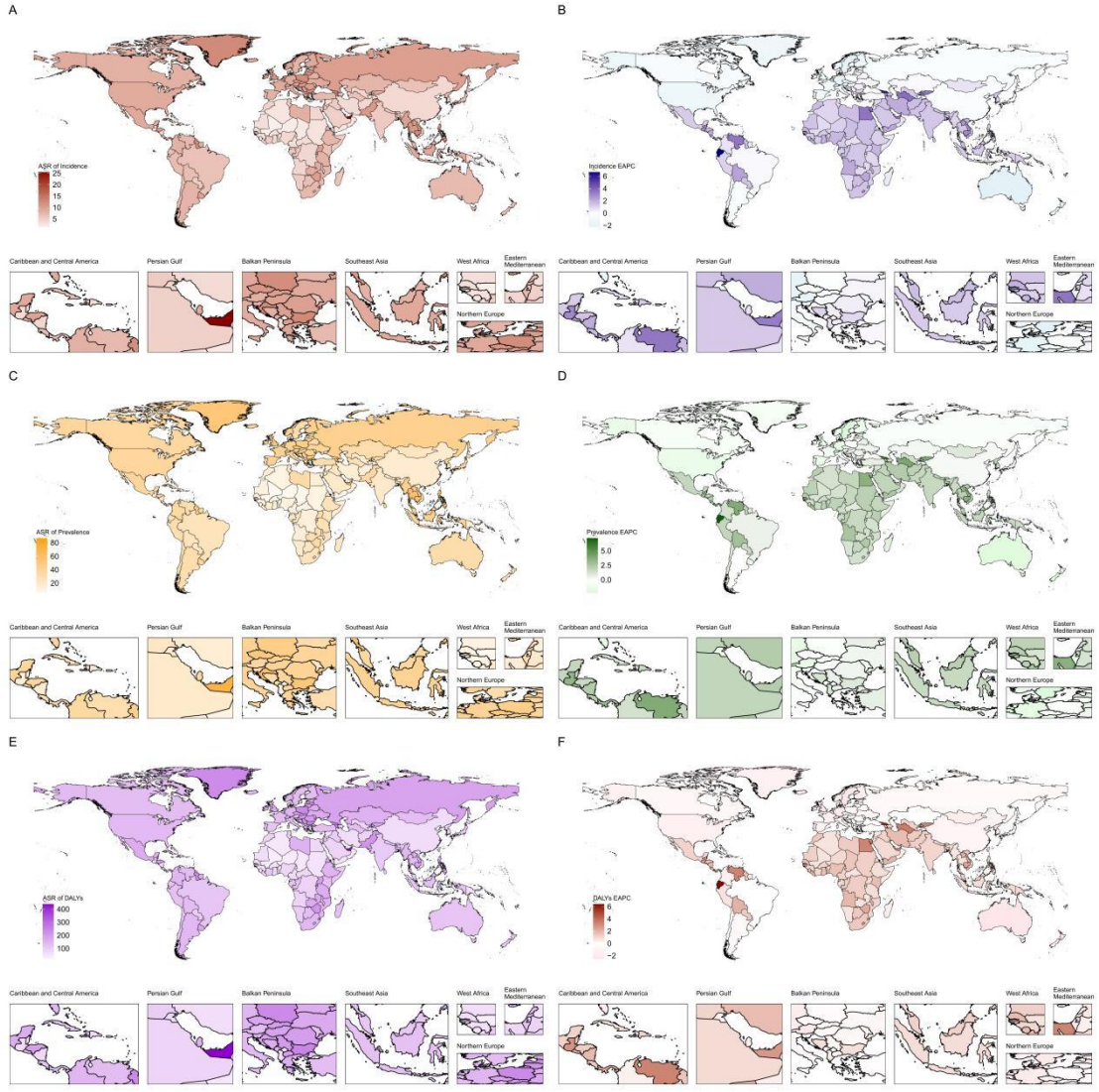


Figure 2

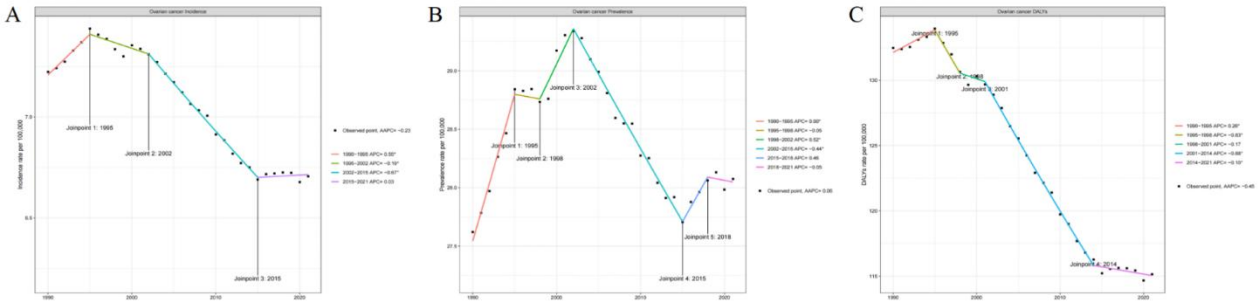


Figure 3

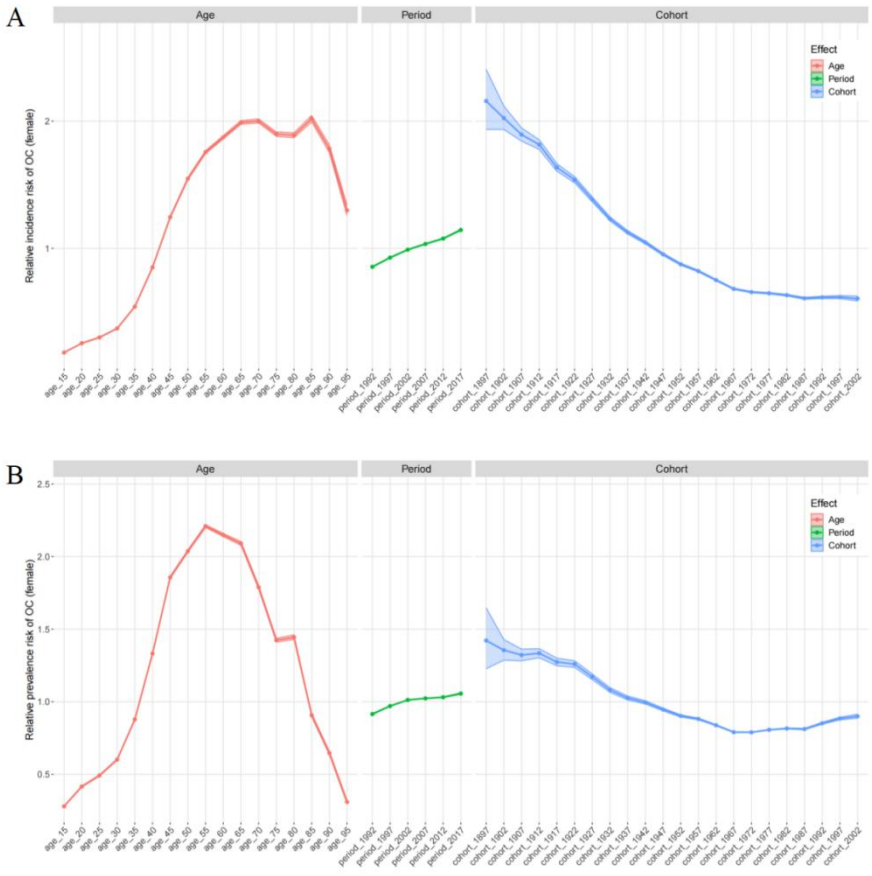


Figure 4

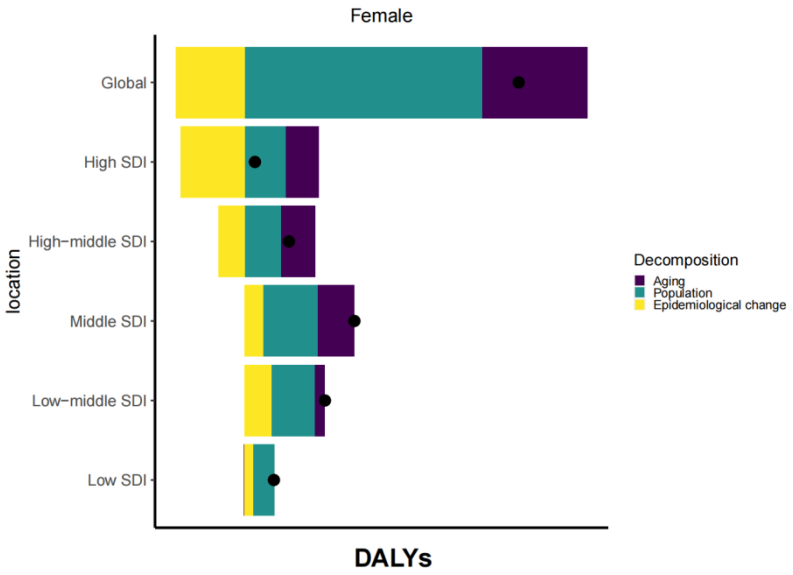

Female
Global
High SDI
High−middle SDI
Middle SDI
Low−middle SDI
Low SDI
location
DALYs
Decomposition
Aging
Population
Epidemiological change

Figure 5

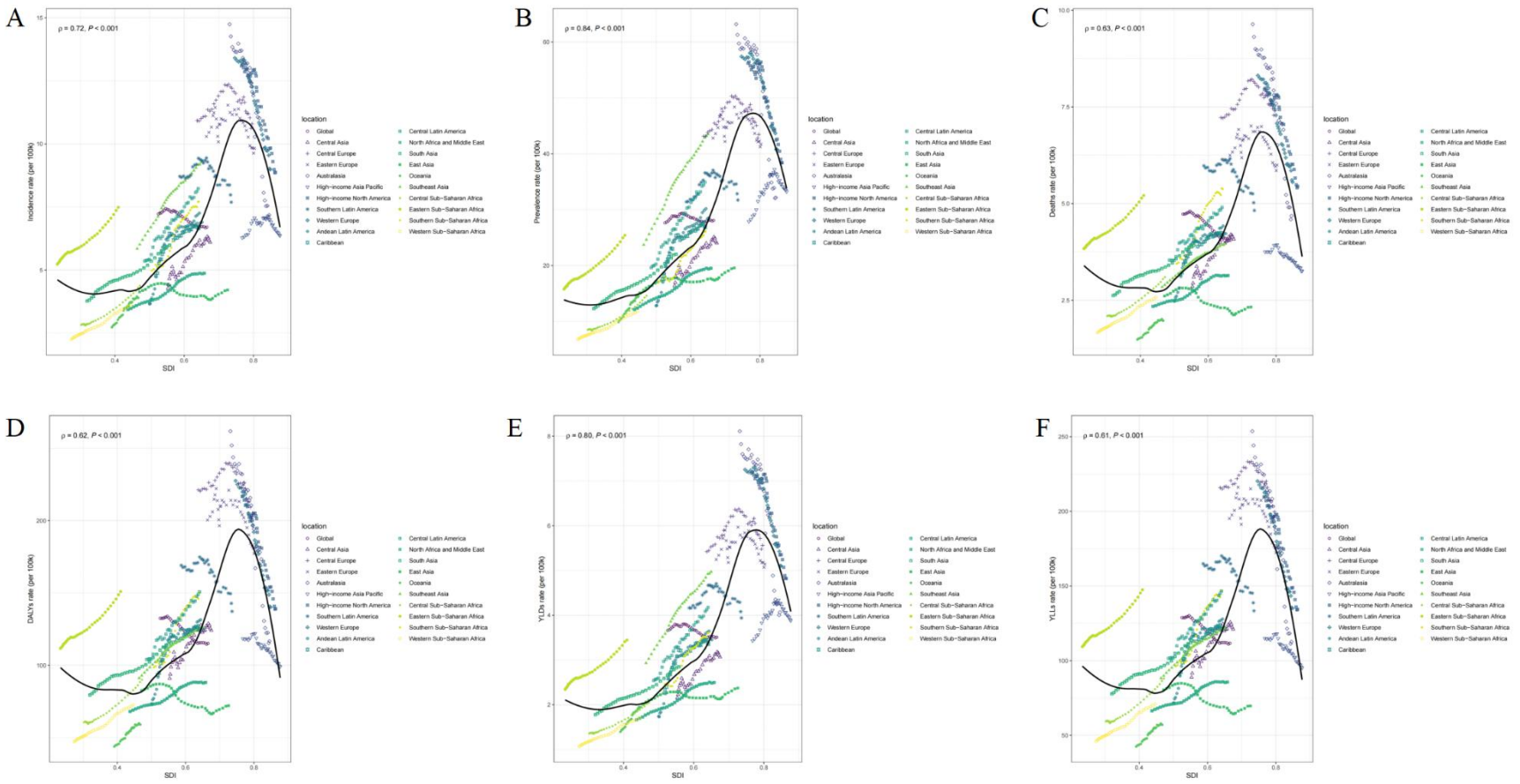

A
ρ = 0.72, P < 0.001
Incidence rate (per 100k)
SDI
B
ρ = 0.84, P < 0.001
Prevalence rate (per 100k)
SDI
C
ρ = 0.63, P < 0.001
Deaths rate (per 100k)
SDI
D
ρ = 0.62, P < 0.001
DALYs rate (per 100k)
SDI
E
ρ = 0.80, P < 0.001
YLDs rate (per 100k)
SDI
F
ρ = 0.61, P < 0.001
YLLs rate (per 100k)
SDI
location
Global
Central Asia
Central Europe
Eastern Europe
Australasia
High-income Asia Pacific
High-income North America
Southern Latin America
Western Europe
Andean Latin America
Caribbean
Central Latin America
North Africa and Middle East
South Asia
East Asia
Oceania
Southeast Asia
Central Sub-Saharan Africa
Eastern Sub-Saharan Africa
Southern Sub-Saharan Africa
Western Sub-Saharan Africa

Figure 6

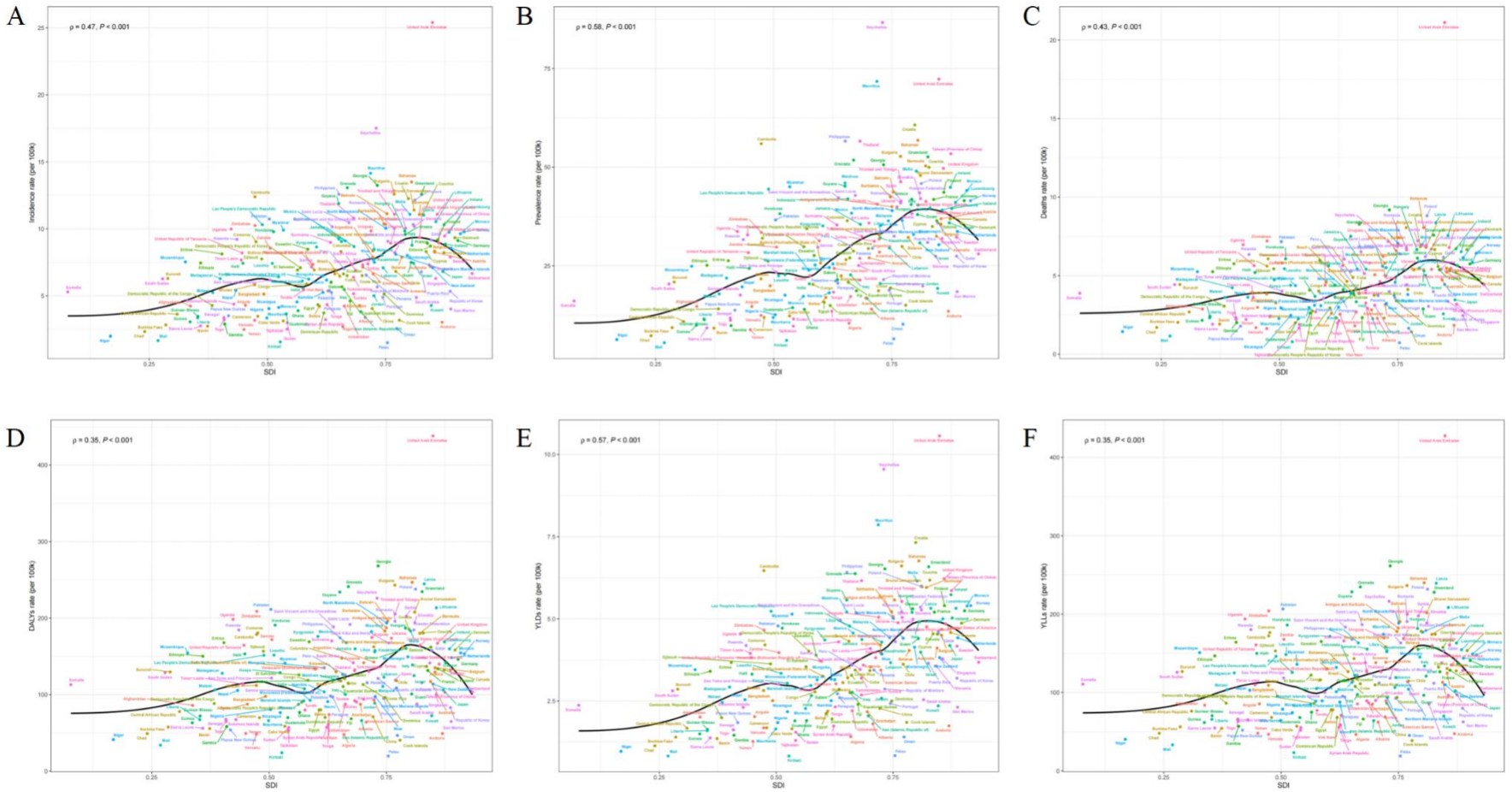

A
ρ = 0.47, P < 0.001
Incidence rate (per 100k)
SDI
B
ρ = 0.58, P < 0.001
Prevalence rate (per 100k)
SDI
C
ρ = 0.43, P < 0.001
Deaths rate (per 100k)
SDI
D
ρ = 0.35, P < 0.001
DALYs rate (per 100k)
SDI
E
ρ = 0.57, P < 0.001
YLDs rate (per 100k)
SDI
F
ρ = 0.35, P < 0.001
YLLs rate (per 100k)
SDI

Figure 7

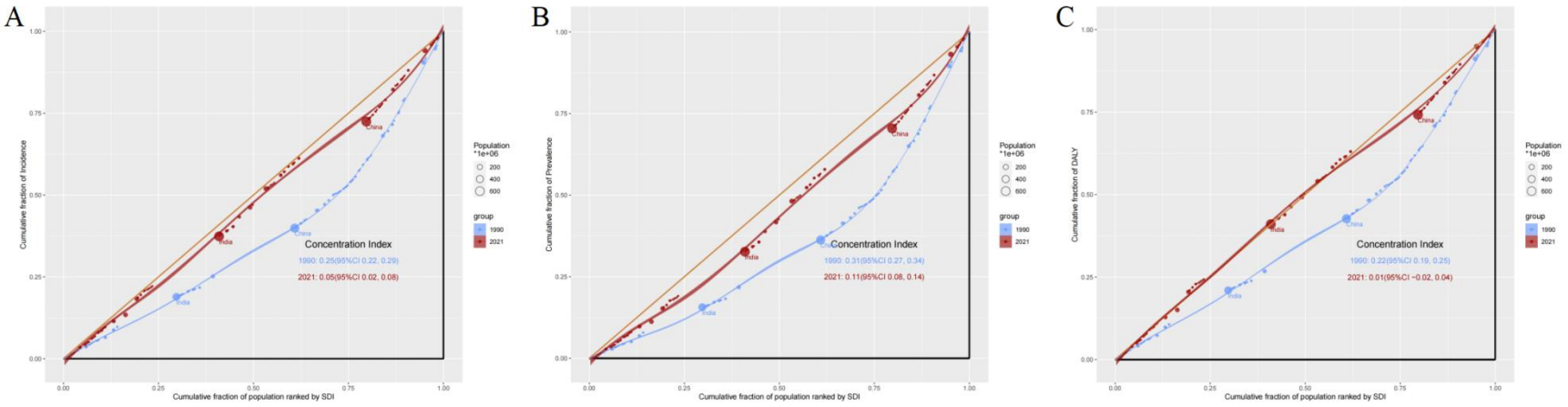

A
Cumulative fraction of Incidence
Cumulative fraction of population ranked by SDI
Concentration Index
1990: 0.25(95%CI 0.22, 0.29)
2021: 0.05(95%CI 0.02, 0.08)
India
China
Population
*1e+06
200
400
600
group
1990
2021
B
Cumulative fraction of Prevalence
Cumulative fraction of population ranked by SDI
Concentration Index
1990: 0.31(95%CI 0.27, 0.34)
2021: 0.11(95%CI 0.08, 0.14)
India
China
Population
*1e+06
200
400
600
group
1990
2021
C
Cumulative fraction of DALY
Cumulative fraction of population ranked by SDI
Concentration Index
1990: 0.22(95%CI 0.19, 0.25)
2021: 0.01(95%CI −0.02, 0.04)
India
China
Population
*1e+06
200
400
600
group
1990
2021

Table 1. Global and regional incidence of OC in 1990 and 2021, and EAPC of ASR from 1990 to 2021.

Location	1990		2021		EAPC, 1990-2021
	Number	ASR	Number	ASR	
Global	159095.96 (145708.88–174055.01)	7.22 (6.65–7.87)	298876.00 (270729.82–324501.02)	6.71 (6.07–7.28)	-0.38(-0.43 to -0.32)
High SDI	69473.69 (66204.67–71846.89)	11.96 (11.45–12.34)	80651.37 (73424.59–85364.17)	8.40 (7.84–8.81)	-1.21(-1.32 to -1.09)
High-middle SDI	43720.89 (39641.25–47139.08)	7.87 (7.13–8.49)	67777.96 (60033.34–75752.67)	6.93 (6.10–7.76)	-0.53(-0.61 to -0.46)
Middle SDI	27387.02 (23080.38–32668.91)	4.33 (3.73–5.12)	82367.53 (71878.65–92302.66)	5.81 (5.07–6.50)	0.73(0.65 to 0.81)
Low-middle SDI	13413.21 (10566.08–18204.43)	3.69 (2.90–5.02)	50273.66 (43482.30–59052.33)	6.01 (5.22–7.07)	1.51(1.45 to 1.58)
Low SDI	4885.45 (3300.62–7063.51)	3.67 (2.47–5.24)	17466.29 (13144.54–20886.84)	5.42 (4.12–6.43)	1.18(1.09 to 1.28)
Andean Latin America	456.18 (364.94–605.84)	3.65 (2.93–4.78)	2233.17 (1706.37–2815.95)	6.90 (5.27–8.68)	2.12(1.74 to 2.51)
Australasia	1796.05 (1657.88–1914.69)	14.75 (13.63–15.69)	1825.52 (1613.00–1993.81)	7.18 (6.51–7.81)	-2.21(-2.57 to -1.85)
Caribbean	687.33 (625.48–851.79)	4.78 (4.37–5.88)	1830.92 (1569.51–2215.28)	6.66 (5.70–8.07)	0.91(0.73 to 1.09)
Central Asia	1219.94 (1112.09–1337.15)	4.28 (3.90–4.68)	2998.96 (2602.07–3418.89)	6.10 (5.31–6.94)	1.22(1.07 to 1.38)
Central Europe	8649.53 (8349.41–8945.49)	10.92 (10.54–11.30)	11442.70 (10515.96–12322.48)	10.80 (9.93–11.68)	0(-0.16 to 0.17)
Central Latin America	2850.13 (2771.80–2929.20)	5.35 (5.19–5.51)	11429.14 (9936.69–12916.31)	8.23 (7.16–9.29)	1.38(1.29 to 1.47)
Central Sub-Saharan Africa	406.39 (266.73–621.38)	2.83 (1.87–4.32)	1636.84 (949.44–2332.89)	4.38 (2.49–6.25)	1.49(1.29 to 1.69)
East Asia	21065.43 (15069.18–27403.26)	4.13 (3.06–5.34)	44239.91 (33123.68–57358.78)	4.21 (3.15–5.46)	-0.35(-0.49 to -0.2)
Eastern Europe	16386.70 (15665.87–17089.10)	10.30 (9.83–10.75)	18015.49 (16129.06–20269.46)	9.83 (8.77–11.03)	-0.22(-0.39 to -0.05)
Eastern Sub-Saharan Africa	2407.83 (1432.59–3482.28)	5.23 (3.16–7.47)	8615.51 (5976.33–10747.85)	7.48 (5.31–9.25)	1.08(1 to 1.17)
High-income Asia Pacific	6798.13 (6490.41–7078.81)	6.28 (6.01–6.54)	11227.65 (9782.40–12235.43)	6.36 (5.69–6.75)	-0.01(-0.16 to 0.14)
High-income North America	23985.89 (22700.98–24738.16)	13.09 (12.52–13.44)	27976.06 (25614.91–29326.34)	8.88 (8.29–9.27)	-1.33(-1.51 to -1.16)
North Africa and Middle East	3374.78 (2676.65–4789.43)	3.43 (2.72–4.84)	12436.21 (10098.97–14422.59)	4.87 (3.96–5.63)	1.26(1.2 to 1.32)
Oceania	49.86 (33.26–68.83)	2.73 (1.89–3.77)	185.52 (105.31–256.55)	3.90 (2.32–5.28)	1.14(1.02 to 1.26)
South Asia	12511.24 (9361.05–16327.09)	3.77 (2.80–4.87)	49664.47 (42260.25–59355.00)	5.99 (5.13–7.14)	1.37(1.28 to 1.45)
Southeast Asia	10046.56 (7838.03–14358.26)	5.85 (4.63–8.13)	35031.98 (26271.21–45639.37)	9.28 (6.97–12.04)	1.39(1.28 to 1.49)
Southern Latin America	2202.92 (2022.67–2397.97)	8.71 (8.00–9.49)	3405.19 (3154.70–3641.43)	7.69 (7.14–8.23)	-0.25(-0.42 to -0.09)
Southern Sub-Saharan Africa	866.18 (721.85–1068.76)	4.98 (4.05–6.25)	2775.58 (2119.30–3220.22)	7.71 (5.88–8.93)	1.61(1.47 to 1.74)
Western Europe	39089.22 (36930.70–40638.46)	13.41 (12.79–13.88)	38281.57 (34487.65–40724.83)	8.99 (8.35–9.44)	-1.35(-1.44 to -1.25)
Western Sub-Saharan Africa	1105.58 (760.66–1400.33)	2.25 (1.55–2.83)	4732.53 (3184.53–6134.02)	3.62 (2.40–4.64)	1.59(1.51 to 1.67)

Table 2. Global and regional prevalence of OC in 1990 and 2021, and EAPC of ASR from 1990 to 2021.

Location	1990		2021		EAPC, 1990-2021
	Number	ASR	Number	ASR	
Global	629089.99 (571666.30–693214.74)	27.62 (25.26–30.26)	1222425.26 (1102105.85–1332111.98)	28.08 (25.26–30.64)	-0.07(-0.13 to 0)
High SDI	271363.75 (262120.76–279280.74)	50.02 (48.43–51.41)	315838.23 (296353.55–330296.10)	37.89 (35.88–39.41)	-0.94(-1.09 to -0.78)
High-middle SDI	174293.53 (155582.98–189291.15)	31.64 (28.23–34.39)	275500.06 (241626.12–309285.56)	30.37 (26.64–34.23)	-0.22(-0.29 to -0.15)
Middle SDI	114272.93 (92514.36–138167.72)	16.34 (13.55–19.54)	356646.19 (306136.48–400487.44)	25.43 (21.73–28.62)	1.24(1.17 to 1.31)
Low-middle SDI	51249.67 (40121.65–69333.37)	12.57 (9.87–16.91)	204118.93 (175156.39–239874.19)	22.92 (19.71–26.94)	1.88(1.82 to 1.94)
Low SDI	17081.62 (11354.69–25131.08)	11.23 (7.57–16.29)	69016.22 (51214.74–83333.42)	18.42 (13.85–22.07)	1.53(1.42 to 1.64)
Andean Latin America	1797.79 (1420.27–2411.57)	12.81 (10.21–17.00)	9484.99 (7149.38–12107.31)	28.51 (21.49–36.37)	2.74(2.3 to 3.17)
Australasia	7321.11 (6796.63–7783.28)	63.19 (58.45–67.04)	7225.03 (6585.66–7833.95)	32.16 (29.64–34.60)	-2.04(-2.45 to -1.64)
Caribbean	2666.77 (2422.33–3271.40)	17.58 (16.06–21.45)	7184.29 (6120.09–8675.07)	26.86 (22.83–32.64)	1.17(0.95 to 1.38)
Central Asia	4772.41 (4347.32–5234.55)	16.40 (14.97–18.00)	12119.22 (10475.23–13837.45)	24.01 (20.78–27.37)	1.3(1.15 to 1.46)
Central Europe	32516.54 (31317.56–33579.74)	43.14 (41.51–44.59)	39849.81 (36674.68–43037.77)	43.47 (39.98–47.08)	0.09(-0.1 to 0.28)
Central Latin America	11989.64 (11654.29–12326.30)	19.61 (19.09–20.13)	48879.47 (42055.38–55319.41)	34.93 (30.06–39.55)	1.89(1.79 to 1.98)
Central Sub-Saharan Africa	1406.70 (934.31–2166.71)	8.49 (5.61–12.93)	6348.86 (3707.89–8953.58)	14.60 (8.47–20.94)	1.84(1.59 to 2.09)
East Asia	87693.17 (58844.99–115455.04)	15.98 (11.05–20.93)	193221.83 (143594.41–251411.89)	19.58 (14.56–25.49)	0.37(0.26 to 0.48)
Eastern Europe	62799.88 (59875.14–65703.27)	42.79 (40.76–44.80)	67894.23 (60235.42–76729.59)	41.71 (36.90–47.34)	-0.14(-0.3 to 0.02)
Eastern Sub-Saharan Africa	8516.26 (5075.05–12230.33)	15.78 (9.41–22.62)	34898.20 (23582.79–44024.45)	25.41 (17.53–31.71)	1.49(1.38 to 1.59)
High-income Asia Pacific	29525.05 (28270.17–30712.81)	27.88 (26.60–29.05)	49705.98 (44069.34–53166.75)	33.22 (30.01–35.16)	0.55(0.32 to 0.78)
High-income North America	95657.09 (92218.08–97907.91)	56.20 (54.51–57.41)	107116.36 (101112.07–111536.32)	38.38 (36.76–39.93)	-1.3(-1.48 to -1.12)
North Africa and Middle East	13500.57 (10576.48–19797.47)	12.13 (9.67–17.44)	54349.68 (43232.71–62929.83)	19.50 (15.67–22.61)	1.63(1.56 to 1.7)
Oceania	210.51 (137.65–292.58)	9.89 (6.67–13.64)	839.43 (462.36–1185.97)	15.47 (8.78–21.50)	1.38(1.23 to 1.52)
South Asia	45997.51 (34383.85–60217.49)	12.30 (9.21–16.05)	193424.48 (160661.77–230736.76)	22.03 (18.49–26.24)	1.77(1.68 to 1.86)
Southeast Asia	45128.85 (33941.48–66031.97)	23.71 (18.34–33.88)	166779.53 (122984.96–216888.66)	43.52 (32.08–56.58)	1.83(1.69 to 1.97)
Southern Latin America	7835.96 (7180.62–8570.10)	31.39 (28.75–34.37)	13171.68 (12192.50–14079.20)	31.73 (29.30–33.94)	0.18(-0.02 to 0.37)
Southern Sub-Saharan Africa	3294.14 (2767.27–4111.53)	17.05 (14.23–20.87)	10011.12 (7740.63–11769.84)	26.13 (20.12–30.57)	1.55(1.44 to 1.66)
Western Europe	150044.13 (143312.66–155595.17)	57.40 (55.03–59.39)	145908.44 (136222.69–153009.27)	40.81 (38.95–42.49)	-1.13(-1.27 to -0.99)
Western Sub-Saharan Africa	3780.56 (2602.41–4838.83)	6.77 (4.67–8.57)	18246.53 (12264.98–23711.97)	11.78 (7.92–15.22)	1.84(1.73 to 1.94)

Table 3. Global and regional DALYs of OC in 1990 and 2021, and EAPC of ASR from 1990 to 2021.

Location	1990		2021		EAPC, 1990-2021
	Number	ASR	Number	ASR	
Global	2909235.57 (2662221.04–3199426.37)	132.48 (121.34–145.63)	5163256.30 (4692422.55–5608304.11)	115.15 (104.58–125.21)	-0.59(-0.64 to -0.54)
High SDI	1191417.73 (1141759.77–1230211.16)	208.23 (200.58–214.57)	1275650.43 (1173209.42–1343084.89)	133.80 (125.32–140.06)	-1.48(-1.57 to -1.4)
High-middle SDI	830373.35 (750604.24–895931.53)	149.55 (135.03–161.63)	1194242.16 (1054540.00–1335946.43)	119.79 (105.13–134.14)	-0.87(-0.95 to -0.79)
Middle SDI	513117.25 (436885.64–612210.28)	82.58 (71.58–97.89)	1416148.86 (1244404.10–1587044.09)	97.76 (85.77–109.48)	0.31(0.23 to 0.39)
Low-middle SDI	265368.44 (208670.41–360506.65)	73.74 (58.18–99.58)	925850.81 (802377.33–1091390.66)	111.40 (96.54–131.20)	1.29(1.23 to 1.34)
Low SDI	104802.06 (70719.16–151776.23)	78.39 (52.96–112.38)	345369.48 (259740.87–413461.42)	108.72 (82.67–129.40)	0.99(0.89 to 1.08)
Andean Latin America	9008.36 (7224.92–11924.08)	73.36 (58.97–96.23)	40484.05 (30833.26–50874.95)	125.60 (95.71–158.01)	1.8(1.44 to 2.15)
Australasia	31387.98 (29123.62–33209.48)	261.75 (242.26–276.49)	29401.76 (26399.30–31858.63)	116.72 (106.15–125.99)	-2.5(-2.82 to -2.18)
Caribbean	13265.09 (12020.12–16784.88)	93.47 (84.91–116.94)	34326.12 (29349.77–41699.87)	124.35 (106.00–151.66)	0.8(0.65 to 0.95)
Central Asia	25758.05 (23408.19–28171.07)	90.99 (82.60–99.60)	61881.11 (53807.39–70556.41)	124.11 (108.08–141.31)	1.05(0.9 to 1.2)
Central Europe	175946.53 (169922.58–182179.80)	221.23 (213.40–228.69)	215729.52 (198220.72–232085.81)	205.22 (189.37–221.33)	-0.2(-0.36 to -0.05)
Central Latin America	54235.28 (52811.24–55615.69)	104.05 (101.06–106.84)	210430.41 (183006.47–237783.39)	150.76 (131.25–170.19)	1.19(1.12 to 1.26)
Central Sub-Saharan Africa	8894.43 (5885.42–13784.30)	60.64 (40.14–93.43)	33664.58 (19263.61–49080.06)	90.01 (50.59–129.58)	1.37(1.17 to 1.56)
East Asia	416565.35 (301040.22–542960.91)	82.65 (61.08–107.10)	787095.89 (580908.59–1024657.54)	72.07 (53.13–94.15)	-0.92(-1.08 to -0.75)
Eastern Europe	321434.83 (306640.94–335970.68)	200.42 (191.08–209.58)	332151.87 (296367.31–371968.36)	180.89 (160.79–203.55)	-0.44(-0.61 to -0.26)
Eastern Sub-Saharan Africa	51354.72 (30348.65–74635.22)	111.66 (66.58–160.61)	170255.60 (117552.17–211891.34)	150.96 (106.18–185.66)	0.91(0.83 to 0.99)
High-income Asia Pacific	128562.40 (123646.42–132898.81)	118.37 (114.08–122.28)	168116.95 (148704.10–180427.51)	98.97 (89.26–104.57)	-0.63(-0.69 to -0.56)
High-income North America	388427.43 (371825.40–399711.55)	216.72 (208.63–222.32)	439443.86 (409029.05–459505.05)	139.13 (131.42–145.12)	-1.49(-1.64 to -1.33)
North Africa and Middle East	66810.56 (53277.23–94960.78)	68.09 (54.20–96.89)	225627.85 (183817.83–261748.07)	88.12 (71.92–102.25)	0.95(0.88 to 1.01)
Oceania	784.50 (516.54–1089.61)	43.87 (29.72–60.65)	2755.14 (1580.22–3789.35)	59.04 (35.09–80.86)	1(0.91 to 1.08)
South Asia	264386.13 (200200.75–344157.49)	79.51 (59.99–102.65)	960207.82 (822850.63–1142385.68)	116.00 (99.82–138.16)	1.09(1.01 to 1.18)
Southeast Asia	150719.00 (119298.73–213939.65)	91.18 (73.07–126.59)	484774.21 (368984.40–633791.17)	126.63 (96.38–165.18)	0.99(0.92 to 1.07)
Southern Latin America	42610.06 (39167.03–46563.31)	169.10 (155.56–184.70)	60642.08 (56166.79–64794.00)	137.30 (127.41–146.65)	-0.51(-0.66 to -0.37)
Southern Sub-Saharan Africa	16945.51 (14149.79–21269.43)	98.60 (79.59–124.62)	54378.62 (41720.33–63224.31)	150.23 (114.98–174.11)	1.59(1.45 to 1.72)
Western Europe	658051.38 (626532.62–683832.96)	227.51 (217.90–236.02)	594073.80 (542482.42–629975.05)	140.16 (131.08–146.93)	-1.61(-1.68 to -1.55)
Western Sub-Saharan Africa	22983.27 (15954.31–29314.44)	47.14 (32.69–59.94)	93968.02 (63290.63–121185.07)	72.64 (48.64–93.39)	1.46(1.38 to 1.55)

Table 4. RRs of OC incidence and prevalence due to age, period and birth cohort effects.

Factor	Incidence		Prevalence	
	RR (95% CI)	*P*	RR (95% CI)	*P*
Age (years)				
15-19	0.181(0.178-0.184)	<0.001	0.279(0.276-0.283)	<0.001
20-24	0.255(0.251-0.258)	<0.001	0.415(0.410-0.420)	<0.001
25-29	0.300(0.297-0.304)	<0.001	0.491(0.486-0.496)	<0.001
30-34	0.371(0.367-0.375)	<0.001	0.601(0.596-0.606)	<0.001
35-39	0.542(0.537-0.547)	<0.001	0.877(0.871-0.884)	<0.001
40-44	0.850(0.844-0.857)	<0.001	1.332(1.324-1.339)	<0.001
45-49	1.245(1.236-1.254)	<0.001	1.857(1.848-1.865)	<0.001
50-54	1.548(1.537-1.558)	<0.001	2.038(2.030-2.047)	<0.001
55-59	1.756(1.744-1.768)	<0.001	2.210(2.200-2.219)	<0.001
60-64	1.872(1.860-1.885)	<0.001	2.149(2.138-2.160)	<0.001
65-69	1.989(1.975-2.004)	<0.001	2.091(2.078-2.104)	<0.001
70-74	2.001(1.985-2.017)	<0.001	1.789(1.775-1.803)	<0.001
75-79	1.897(1.880-1.915)	<0.001	1.424(1.411-1.437)	<0.001
80-84	1.888(1.869-1.909)	<0.001	1.445(1.429-1.460)	<0.001
85-89	2.018(1.993-2.044)	<0.001	0.907(0.894-0.919)	<0.001
90-94	1.782(1.752-1.813)	<0.001	0.646(0.634-0.658)	<0.001
95-99	1.298(1.257-1.340)	<0.001	0.309(0.296-0.322)	<0.001
Period				
1992	0.855(0.850-0.859)	<0.001	0.915(0.911-0.919)	<0.001
1997	0.927(0.923-0.931)	<0.001	0.970(0.967-0.973)	<0.001
2002	0.989(0.986-0.993)	<0.001	1.012(1.010-1.014)	<0.001
2007	1.035(1.031-1.039)	<0.001	1.023(1.021-1.025)	<0.001
2012	1.077(1.072-1.081)	<0.001	1.031(1.028-1.034)	<0.001
2017	1.144(1.139-1.150)	<0.001	1.056(1.051-1.061)	<0.001
Birth cohort				
1897	2.157(1.934-2.406)	<0.001	1.422(1.227-1.647)	<0.001
1902	2.024(1.934-2.118)	<0.001	1.355(1.286-1.428)	<0.001
1907	1.894(1.843-1.946)	<0.001	1.322(1.282-1.363)	<0.001
1912	1.815(1.777-1.853)	<0.001	1.334(1.303-1.366)	<0.001
1917	1.636(1.606-1.665)	<0.001	1.274(1.248-1.300)	<0.001
1922	1.539(1.516-1.564)	<0.001	1.259(1.236-1.282)	<0.001
1927	1.385(1.365-1.404)	<0.001	1.171(1.152-1.191)	<0.001
1932	1.232(1.216-1.248)	<0.001	1.081(1.065-1.097)	<0.001
1937	1.126(1.113-1.139)	<0.001	1.026(1.012-1.039)	<0.001
1942	1.047(1.036-1.058)	<0.001	0.995(0.984-1.007)	0.419
1947	0.954(0.944-0.963)	<0.001	0.946(0.937-0.956)	<0.001
1952	0.875(0.867-0.883)	<0.001	0.902(0.895-0.910)	<0.001
1957	0.821(0.814-0.829)	<0.001	0.881(0.875-0.887)	<0.001
1962	0.751(0.745-0.757)	<0.001	0.838(0.833-0.842)	<0.001
1967	0.682(0.676-0.687)	<0.001	0.790(0.787-0.793)	<0.001
1972	0.656(0.651-0.662)	<0.001	0.789(0.786-0.792)	<0.001
1977	0.647(0.641-0.653)	<0.001	0.806(0.803-0.809)	<0.001
1982	0.632(0.626-0.639)	<0.001	0.815(0.812-0.819)	<0.001
1987	0.608(0.600-0.615)	<0.001	0.811(0.806-0.816)	<0.001
1992	0.615(0.606-0.624)	<0.001	0.851(0.845-0.858)	<0.001
1997	0.617(0.605-0.629)	<0.001	0.884(0.875-0.893)	<0.001
2002	0.606(0.587-0.625)	<0.001	0.900(0.887-0.913)	<0.001

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