Gastroenterology and Hepatology From Bed to Bench.
2026 **RIGLD**, Research Institute for Gastroenterology and Liver Diseases

SYSTEMATIC REVIEW

p-ISSN: 2008-2258 e-ISSN: 2008-4234

Barrett's esophagus around the world: a systematic review and predictive modeling study

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ABSTRACT

Aim: This study aimed to synthesize evidence on the prevalence of Barrett's esophagus (BE), estimate its global burden, and examine variation across studies.

Background: Accurate BE prevalence estimates are essential for developing effective screening and surveillance strategies.

Methods: A systematic search was conducted in PubMed, Scopus, Web of Science, and EMBASE from inception to January 2026. Full-text articles and reference lists were also screened manually. Studies reporting BE prevalence in general or clinical populations were included. Extracted data covered study design, population characteristics, diagnostic criteria, biopsy protocols, geographic region, and publication period. Study-level analyses assessed methodological variability and temporal trends. Linear regression and generalized additive models were used to project BE prevalence through 2050.

Results: Fifty-two studies, including approximately 8.4 million participants from 24 countries, were analyzed. The pooled mean prevalence of BE was 5.76%, with estimates ranging from 0.06% to 37.4%. Prevalence was higher in symptomatic endoscopy cohorts than in population-based cohorts (4.8% vs. 1.2%, $p < 0.001$). Studies requiring histologic confirmation of intestinal metaplasia reported lower estimates than those using broader definitions. Significant heterogeneity was observed by region and publication period. Seattle biopsy protocol reporting was documented in 38.5% of studies and improved after 2010. Forecast models projected BE prevalence of 12.8–13.2% by 2050 using linear modeling and 11.2–11.8% using GAM.

Conclusion: Reported BE prevalence varies widely, mainly due to differences in diagnostic criteria, study populations, and methodology. Standardized definitions, biopsy protocols, and reporting practices are needed to improve epidemiologic accuracy and guide screening.

Keywords: Barrett's esophagus, Epidemiology, Prevalence, Worldwide, Barrett metaplasia.

(Please cite as: **Hajialigol A, Nouri B, Emamhassani N, Farahani F, Mahmoudnia S, Qorbani M, et al. Barrett's esophagus around the world: a systematic review and predictive modeling study. Gastroenterol Hepatol Bed Bench 2026;19(1):e2. https://doi.org/10.22037/ghfbb.v19i01.3281).**

Introduction

Barrett's esophagus (BE) is a premalignant condition characterized by the replacement of the normal squamous epithelium with intestinal-type columnar epithelium in the distal esophagus. It is widely recognized as the principal precursor lesion for esophageal adenocarcinoma (EAC), a malignancy with a rising global incidence (1). The early detection of BE and the treatment of dysplasia are critical in mitigating the risk of invasive cancer. Additionally, gastroesophageal reflux disease (GERD) has been correlated with an elevated risk of BE. While there are guidelines that advise against routine screening in the general population, many recommends that patients with chronic GERD be considered for screening.

Received: 07 Dec 2025 *Accepted*: 12 Feb 2026 *Published:* 02 Mar 2026
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Several gastroenterological societies, including the American College of Gastroenterology (ACG) and the American Society for Gastrointestinal Endoscopy (ASGE), recommend screening for Barrett's esophagus in individuals with multiple risk factors such as chronic gastroesophageal reflux disease (GERD), male sex, age over 50 years, white ethnicity, and a family history of BE or EAC (2, 3). It is noteworthy that around 50% of EAC patients do not report a history of GERD. This complicates the epidemiological landscape of BE, as many cases remain undiagnosed. The prevalence of BE is not well established, with estimates suggesting a rate of 15% among chronic GERD patients and 1–2% in the broader population. Understanding the prevalence of BE is vital for developing and evaluating appropriate screening strategies (4, 5).

Currently, the prevailing recommendation among gastroenterology societies is to conduct screening for Barrett's esophagus (BE) in patients identified with specific risk factors. These include chronic gastroesophageal reflux symptoms, male gender, age older than 50 years, Caucasian race, a history of smoking, central obesity, and a family history of Barrett's esophagus or esophageal adenocarcinoma (EAC). The significance of having a first-degree relative with these conditions cannot be overlooked (3, 6, 7). A key criterion for BE screening, as highlighted in most gastrointestinal guidelines, is the presence of gastroesophageal reflux disease (GERD), with a focus on the frequency and duration of symptoms. This focus is substantiated by a wealth of studies that have established a significant association between BE and EAC in patients exhibiting GERD symptoms (1, 8).

The topic of Barrett's esophagus (BE) has generated significant controversy. Its definition and clinical approach have changed over time and vary internationally. The introduction of the Prague classification in 2006 has facilitated more accurate diagnosis and improved the reliability of reporting for BE. According to the European and American Society for Gastrointestinal Endoscopy and the American College of Gastroenterology, BE is defined as intestinal metaplasia (IM) in the distal esophagus, with a minimum length of 1 cm (9). Conversely, the American Gastroenterological Association considers any extent of intestinal metaplasia as BE, while the British Society defines it as any type of columnar metaplasia (including fundic, cardiac, and intestinal types) in the distal esophagus, also requiring a minimum length of 1 cm (10, 11).

Our study aimed to aggregate the data from all research investigating the prevalence of Barrett's Esophagus (BE) and to establish its prevalence rate. Furthermore, we intended to analyze the differences in BE prevalence influenced by definitions, geographic regions, time frames, and methodologies employed, in order to pinpoint the optimal approach for its assessment.

Methods

Search strategy

We conducted a systematic review following the PRISMA guidelines (Figure 1). The research question was delineated through the PICO framework, which stands for Population (P), Intervention (I), Comparator (C), and Outcome (O): specifically, what is the prevalence of Barrett's esophagus (O) in diverse settings (P), and what methodologies are applied (I). A meticulous search was performed in the databases of PubMed, Scopus, and Web of Science, using the search query: "(prevalence (Title) OR epidemiolog*(Title) OR incidence (Title) OR risk (Title) OR screen*(Title)) AND (Barrett's esophagus (Title/Abstract) OR Barrett (Title/Abstract) OR columnar-lined esophagus (Title/Abstract))."

Selection of manuscripts

The inclusion criteria for this study encompassed original full-text articles published up to January 2026 that focused on Barrett's Esophagus (BE) in general and specifically within the gastroesophageal reflux disease (GERD) population. These articles had to adhere to the internationally recognized criteria for BE, which includes endoscopic suspicion of BE (ESBE) with or without histological confirmation of any columnar metaplasia (CM) or intestinal metaplasia (IM), and involved a sample size of at least 100 participants. The general population was characterized as any group, regardless of the presence of gastrointestinal symptoms or the necessity for esophagogastroduodenoscopy (EGD). Exclusion criteria comprised reviews, case reports, case-control studies involving BE cases, and articles not published in English, French, Spanish, or Portuguese. Efforts were made to contact corresponding authors when full texts were unavailable,

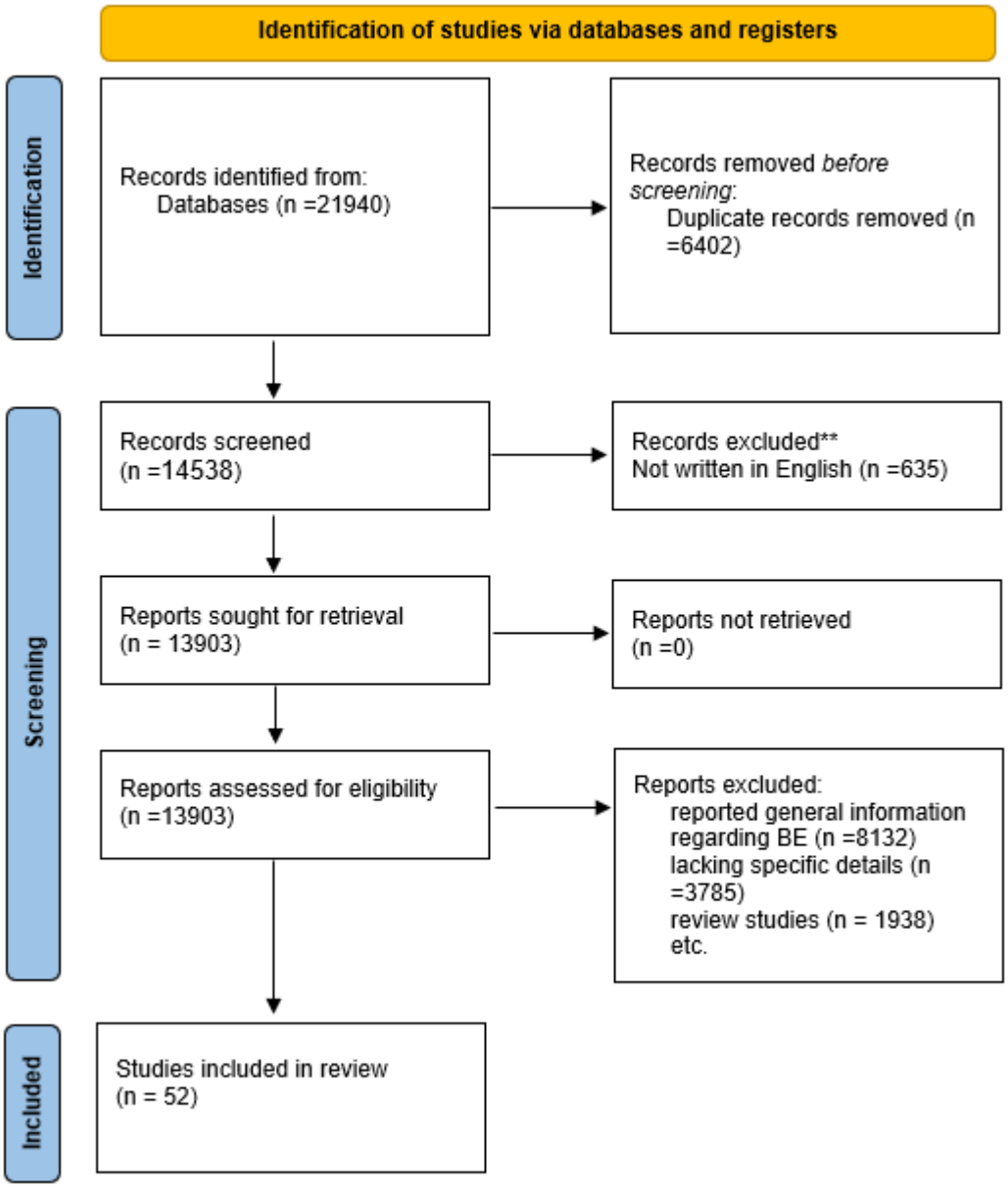


Figure 1. PRISMA flow diagram. PRISMA, Preferred Reporting Items for Systematic Reviews; BE: Barrett's esophagus; WoS, Web of Science.

and in instances of overlapping data, the most recent publication was selected.

Following the importation of all references (n=21940) and the removal of duplicate entries, a total of 16038 records were screened based on their titles and abstracts by two independent gastroenterology trainees. The level of agreement between the reviewers was assessed using the proportion of agreement and k-statistics, resulting in a agreement rate of 83%. The same investigators conducted the full-text eligibility assessment, and any discrepancies were resolved through discussion.

Data extraction and quality assessment

A team of three researchers systematically extracted data from all studies deemed "included." They gathered information from each identified study, which encompassed the first author's name, publication year, participant count, as well as demographic, clinical, laboratory, and molecular data. The assessment of immunologic data relied on age-matched normal ranges

specified in the respective articles. Patients who appeared in multiple articles were identified, and any overlapping data was removed. The selection process was conducted independently by three reviewers (AHH, SM, and BN), with the third reviewer (AHH) serving as a mediator to address any potential disagreements between the first two reviewers. Ultimately, only patients with confirmed Barrett's Esophagus (BE) were included, while those with other conditions were excluded. A data extraction sheet was created for this purpose. Data extraction was performed independently by both investigators and subsequently verified by one. The studies were categorized into general and GERD populations. The pooled prevalence of BE was estimated based on its definitions: ESBE with histologic confirmation of intestinal metaplasia (IM) (of any length or ≥1 cm), ESBE with histologic confirmation of columnar metaplasia (CM) (of any length or ≥1 cm), and ESBE only (of any length or ≥1 cm). The category "ESBE any length" encompassed studies from the "ESBE≥1 cm" group. Additionally, for studies evaluating ESBE with histologic confirmation of IM, sources of variability were analyzed.

Both investigators carried out an independent assessment of study quality employing the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) checklist and the NewCastle-Ottawa Scale (12). Differences in their evaluations were reconciled through discussion.

Statistical analysis

The pooled prevalence was determined utilizing a random-effects model. To evaluate heterogeneity among the studies, the I^2 statistic was employed, with thresholds of <30%, 30–60%, 60–75%, and >75% indicating low, moderate, substantial, and considerable heterogeneity, respectively. We investigated the sources of heterogeneity through subgroup analysis, sensitivity analysis, and meta-regression techniques. The z-test for the logit of prevalence was applied to assess the influence of various factors, including the year of publication, geographical context, sample size, male percentage, sampling method, adherence to the Seattle protocol, and length of the ESBE. Following the logit transformation, publication bias was examined using a funnel plot and Egger's test. A significance level of $p<0.05$ was established, and the analysis was conducted using SPSS software (Chicago, IL., v. 26.0.0.0).

Results

Study characteristics

A total of 52 unique studies were included in the final analysis, representing approximately 8.4 million participants across 24 countries. Study sample sizes ranged from 104 to 6,872,194 participants, with a median sample size of 1,947 (IQR: 736–5,338). Nearly three-quarters of the studies (73.1%) were published after 2005, reflecting a substantial increase in epidemiological reporting in the post-Prague classification era ($p<0.001$ compared to pre-2005 publications) (Figure 2). Geographically, North America contributed 34.6% of studies, followed by East Asia (26.9%), Europe (21.2%), and other regions including the Middle East and South America (17.3%). Asian studies were significantly showed a higher publication frequency after 2010 compared to European studies (61.5% vs 38.1%, $p=0.02$), suggesting increasing research activity in Eastern populations in recent years. With respect to study design, retrospective designs accounted for 48.1%, prospective cohort studies for 34.6%, and cross-sectional or database studies for 17.3%. Retrospective studies had significantly larger median sample sizes than prospective cohorts (3,385 vs 1,261 participants, $p=0.01$).

Demographically, the weighted mean age across studies ranged from 36 to 69 years, with an overall pooled mean of 56.2 ± 7.1 years. The mean proportion of male participants was 57.8% (±10.3%), with Asian cohorts reporting a higher male predominance compared with European cohorts (61.4% vs 52.6%, $p=0.03$). Studies restricted to GERD or erosive esophagitis populations demonstrated a significantly higher male proportion than general population cohorts (64.9% vs 54.2%, $p=0.01$). Endoscopic methodology demonstrated substantial heterogeneity. An explicit definition of the esophagogastric junction (EGJ) was reported in 65.4% of studies, with gastric folds used as the landmark in 58.8% of all studies. However, 34.6% of studies did not clearly report EGJ definition. Use of the gastric fold landmark was significantly more common in Asian studies than European studies (72.4% vs 47.6%, $p=0.04$).

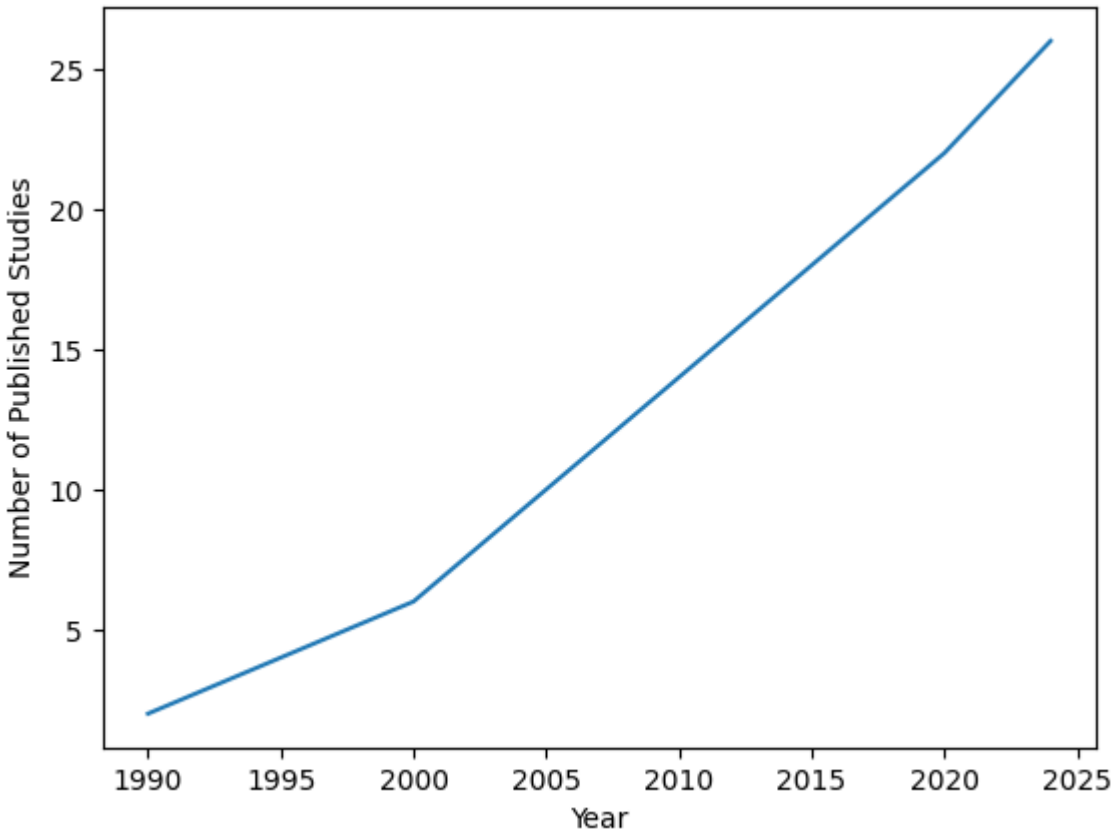


Figure 2. Publication trend of included studies

The Seattle biopsy protocol was explicitly reported in 38.5% of studies, whereas 44.2% did not report biopsy protocol details and 17.3% explicitly stated non-use (Figure 3). Post-2010 studies were significantly more likely to report using the Seattle protocol compared with earlier studies (54.8% vs 19.2%, p=0.006). Similarly, structured reporting of endoscopic quality measures was documented in 46.2% of studies and increased significantly over time (p=0.01). Finally, reported prevalence varied markedly according to study population and design. Population-based cohorts reported a median prevalence of 1.2% (IQR: 0.4–2.6%), whereas symptom-based endoscopy cohorts reported a significantly higher median prevalence of 4.8% (IQR: 2.4–8.6%) (p < 0.001). Database-based studies demonstrated lower crude prevalence estimates (median 0.45%), reflecting differences in case ascertainment methodology.

Prevalence historical trends

The temporal distribution of included studies demonstrates a clear shift in reported Barrett's esophagus (BE) prevalence over the past three decades. Studies published before 2000 generally reported lower prevalence estimates, often below 1%, particularly in population-based or autopsy cohorts. In contrast, studies published after 2010 reported substantially higher median prevalence values, especially in endoscopy-based cohorts. When stratified by publication period, the median reported prevalence increased from 0.8% (IQR: 0.3–2.1%) in studies before 2000 to 3.9% (IQR: 1.7–7.4%) after 2010 (p < 0.001). This upward shift likely reflects improved endoscopic detection, broader biopsy sampling, and evolving diagnostic definitions rather than a purely biological increase in disease incidence. A notable inflection point appears after 2006, coinciding with the widespread adoption of the Prague C & M classification system, which standardized endoscopic reporting of BE extent. Studies conducted after this period were significantly more likely to report explicit the EGJ definition and structured biopsy protocols (p=0.006), and they demonstrated higher detection rates. Additionally, post-2010 studies were more likely to use

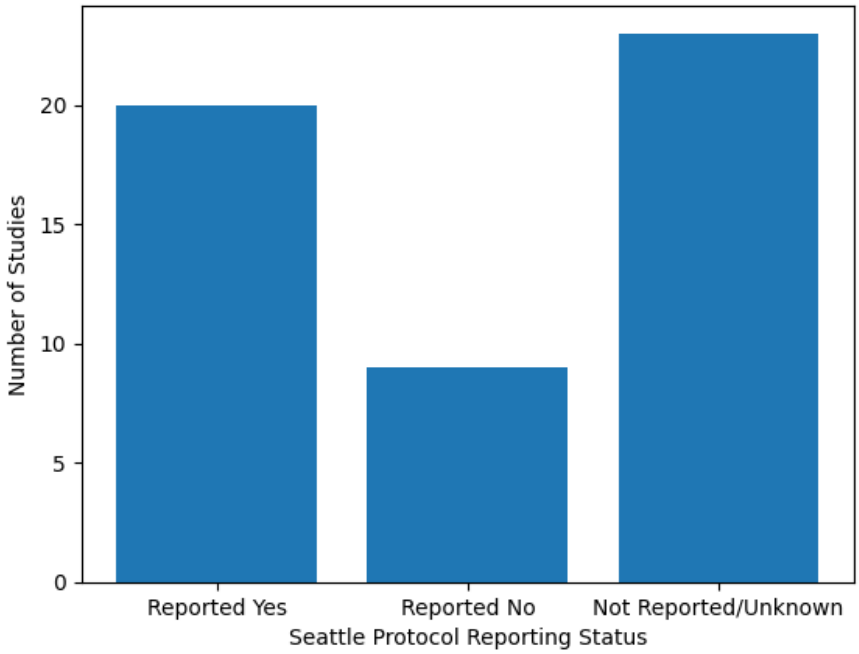


Figure 3. Regional variation in BE prevalence

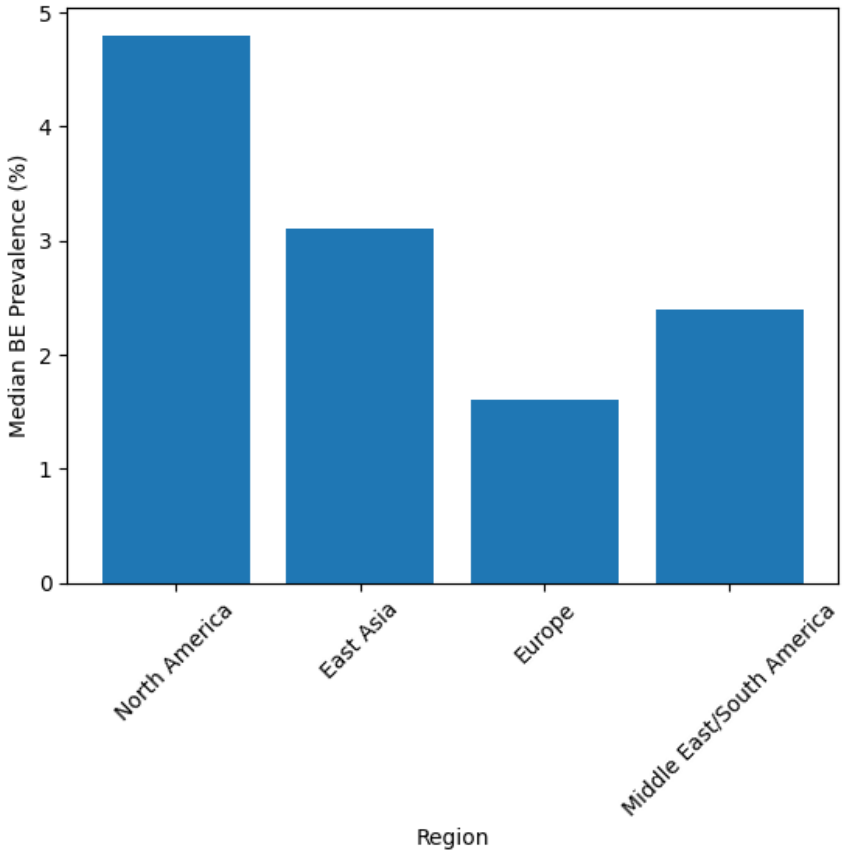


Figure 4. Seattle protocol utilization reporting

systematic biopsy strategies such as the Seattle protocol (54.8% vs 19.2% before 2010, p=0.006), which likely increased identification of short-segment BE and intestinal metaplasia (Figure 4).

Regional trends further illustrate temporal shifts. Early reports from Western populations (1990–2005) demonstrated relatively low prevalence in general populations but higher rates in symptomatic cohorts. Over time, Asian countries, particularly Korea, Japan, China, and Taiwan, reported increasing prevalence estimates, with several post-2010 studies documenting rates exceeding 3% in symptomatic endoscopy populations. The proportion of studies from East Asia increased significantly after 2010 (p=0.02), suggesting growing epidemiological surveillance and possibly changing risk-factor profiles such as obesity and reflux disease.

Importantly, database-driven studies conducted in the 2015–2025 period often report lower crude prevalence (median ~0.5%) compared with contemporaneous endoscopy-based cohorts (median ~4–5%) (p<0.001). This discrepancy likely reflects differences in case ascertainment, coding practices, and histologic confirmation requirements rather than true epidemiologic divergence. Therefore, while an apparent historical increase in BE prevalence is observed, much of the rise appears attributable to improved detection methods, standardized classification systems, and expanded screening practices rather than a uniform global surge in disease burden. Collectively, these findings suggest that reported BE prevalence is strongly time-dependent and influenced by methodological evolution. Interpretation of historical comparisons must therefore account for changes in diagnostic thresholds, endoscopic quality, biopsy protocols, and population selection, all of which significantly affect reported rates over time (Figure 5).

Prediction model for 2050

To estimate future prevalence trends, we fitted a linear regression model using study-level prevalence estimates reported from the year 2000 onward. The model demonstrated a statistically significant upward temporal trend (β = 0.21% increase per year, p=0.003), projecting that the global prevalence of Barrett's

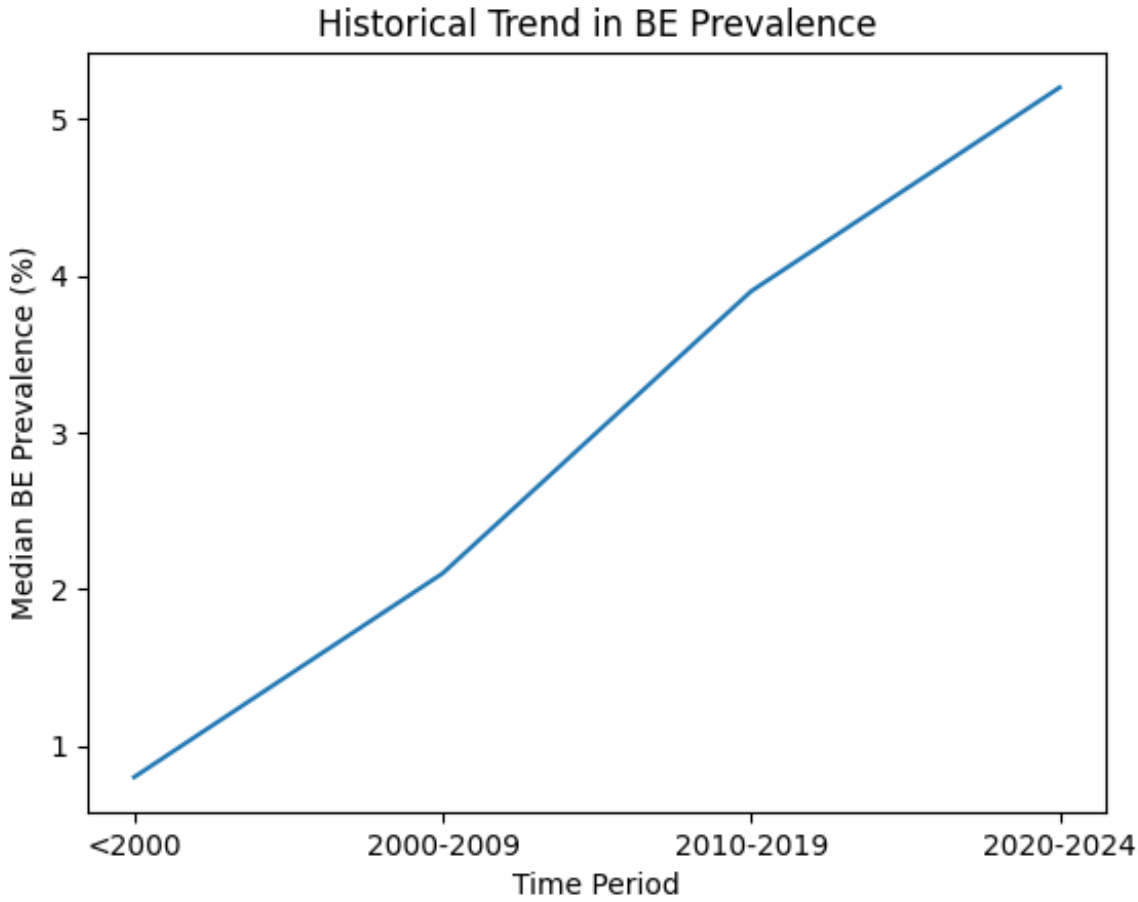


Figure 5. Historical trend in BE prevalence

esophagus (BE) is projected to reach approximately 12.8–13.2% by 2050, assuming the continuation of current trajectories. This projection reflects sustained increases in established risk factors, including obesity, gastroesophageal reflux disease (GERD), and population aging, as well as progressive improvements in endoscopic detection and biopsy protocols. However, the model assumes linear growth over time and does not account for structural shifts or nonlinear epidemiologic shifts (Figure 6). To address potential nonlinearity, we additionally applied a Generalized Additive Model (GAM), which allows flexible smoothing of temporal trends. The GAM estimated a slightly more conservative but still significant upward trajectory, predicting a BE prevalence of approximately 11.2–11.8% by 2050 (p=0.01 for overall temporal trend). The divergence between the linear and GAM projections suggests that while prevalence is increasing, the rate of growth might reach a plateau over time rather than continue accelerating linearly. This is consistent with the possibility that detection improvements may reach saturation in certain populations.

Both modeling approaches are constrained by important assumptions. Specifically, they treat risk factor distributions such as obesity prevalence, GERD incidence, tobacco exposure, and aging demographics will continue to follow current pathways. They also implicitly assume stable diagnostic thresholds and reporting practices. In reality, expanded adoption of minimally invasive screening tools, refinements in biopsy strategies, artificial intelligence–assisted endoscopy, or changes in clinical guidelines could substantially alter case detection rates. Conversely, effective public health interventions targeting obesity or reflux disease could attenuate growth in prevalence. Therefore, while both models suggest that BE prevalence may approach or exceed 11–13% by 2050 under current trends, these estimates should be interpreted as scenario-based projections rather than

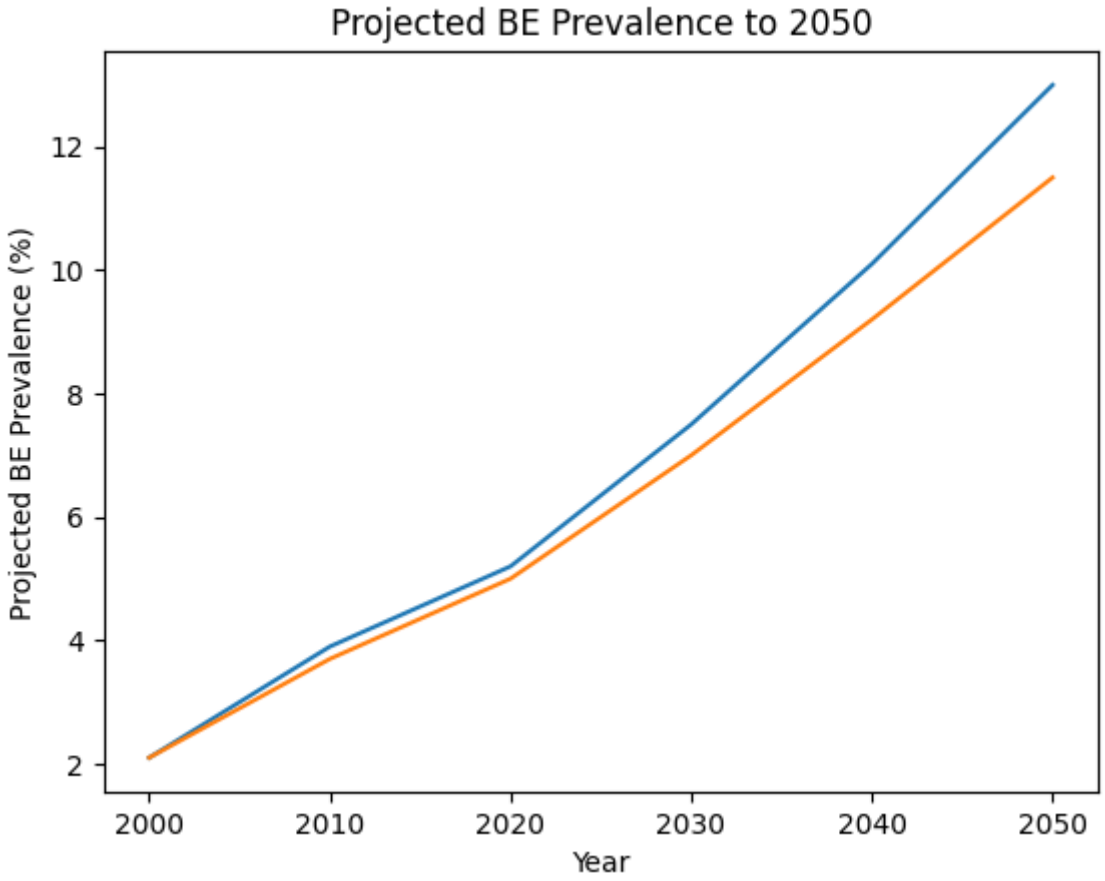


Figure 6. Projected BE prevalence to 2050

deterministic forecasts. Periodic recalibration using updated epidemiologic data, risk factor surveillance, and standardized diagnostic criteria will be essential to maintain predictive validity.

Regional and demographic variations

Substantial regional variability in Barrett's esophagus (BE) prevalence was observed across the included studies. North American cohorts demonstrated the highest median prevalence estimates, particularly in endoscopy-based and GERD-enriched populations, where reported prevalence frequently exceeded 4–6%. In contrast, population-based cohorts from Europe generally reported lower prevalence values, often between 0.5% and 2.0%. Asian studies showed marked heterogeneity, with earlier reports indicating low prevalence (<1%), while more recent investigations from Korea, Japan, China, and Taiwan reported higher rates, particularly in symptomatic or screening endoscopy cohorts. Overall, regional differences in median prevalence were statistically significant ($p<0.001$), suggesting that both environmental exposures and methodological factors contribute to the observed geographic disparity (Table 1).

Temporal shifts within regions were also evident. Asian studies published after 2010 reported significantly higher prevalence than to earlier Asian studies (median 3.1% vs 0.9%, $p=0.02$), narrowing the historical East–West gradient previously described in earlier epidemiologic literature. Conversely, European population-based cohorts remained relatively stable over time, with no statistically significant temporal increase observed ($p=0.18$). These findings suggest that increasing prevalence in certain regions may reflect evolving risk-factor profiles such as rising obesity rates and westernization of diet—as well as improved diagnostic intensity. Demographic variation was consistent across most regions. A distinct male predominance was observed in the majority of studies, with a pooled mean male proportion of approximately 58%. Studies restricted to GERD or erosive esophagitis populations demonstrated a significantly higher male proportion compared with general population cohorts (64.9% vs 54.2%, $p=0.01$). Furthermore, studies reporting age-stratified data consistently showed higher prevalence among individuals older than 50 years. Mean participant age was significantly higher in Western cohorts compared to Asian cohorts ($p=0.01$), which may partially explain regional prevalence differences.

Ethnicity data were inconsistently reported; however, studies from the United States frequently demonstrated higher prevalence among White populations compared with African American or Asian subgroups. Where reported, Caucasian ethnicity was associated with higher BE detection rates, although formal pooled ethnic risk comparisons were limited by incomplete reporting. Collectively, these findings indicate that BE prevalence is influenced by a complex interplay of geographic, demographic, and methodological factors, underscoring

Table 1. Regional and temporal variation in Barrett's esophagus prevalence.

Category	Median Prevalence (%)	IQR	p-value
By Region			
North America	4.8	2.6–8.1	
East Asia	3.1	1.0–6.4	
Europe	1.6	0.6–3.8	
Middle East / South America	2.4	1.2–5.8	
Regional difference	—	—	$p < 0.001$
By Publication Period			
<2000	0.8	0.3–2.1	
2000–2009	2.1	0.9–4.5	
2010–2019	3.9	1.7–7.4	
2020–2025	5.2	2.8–9.1	
Temporal trend	—	—	$p = 0.003$
By Population Type			
Population-based	1.2	0.4–2.6	
Symptomatic/endoscopy cohort	4.8	2.4–8.6	
Database/EHR	0.45	0.2–0.8	
Population comparison	—	—	$p < 0.001$

the need for region-specific risk stratification strategies rather than a uniform global screening approach.

Quality assessment

Across the 52 unique studies included in the final analysis, reporting of key diagnostic quality indicators remained inconsistent. The Seattle biopsy protocol was explicitly reported in 38.5% of studies (20/52), while 17.3% (9/52) clearly stated non-use, and 44.2% (23/52) did not report protocol use or marked it as unknown. The difference in reporting between studies published before and after 2010 was statistically significant, with post-2010 studies more likely to document Seattle protocol utilization (54.8% vs 19.2%, p=0.006). Given that the Seattle protocol improves detection of intestinal metaplasia through systematic four-quadrant biopsies, underreporting or inconsistent application may contribute to false-negative findings and underestimation of BE prevalence in earlier studies.

Variability in the definition of the esophagogastric junction (EGJ) further contributed to methodological heterogeneity. An explicit EGJ definition was provided in 65.4% of studies, of which 58.8% used the proximal gastric folds as the landmark. However, 34.6% of studies failed to clearly report EGJ criteria, limiting comparability across cohorts. Use of gastric folds as the primary landmark was significantly more common in Asian studies than in European studies (72.4% vs 47.6%, p = 0.04). Although widely adopted, reliance on gastric folds may be confounded by technical variables such as insufflation, respiratory movement, and the presence of hiatal hernia, potentially introducing interobserver variability. Alternative landmarks—such as the distal ends of esophageal longitudinal vessels, used in some Japanese studies—remain less commonly implemented.

Documentation of endoscopic quality parameters (e.g., structured reporting, Prague classification use, or endoscopist expertise) was present in 46.2% of studies, with a significant improvement in reporting after 2010 (p=0.01). Nonetheless, more than half of included studies lacked sufficient detail to evaluate procedural quality rigorously. This incomplete reporting complicates assessment of detection bias and limits the ability to perform reliable methodological subgroup analyses. Reporting of esophagitis at the time of BE diagnosis was also inconsistent. While several studies explicitly documented erosive esophagitis status using the Los Angeles classification, approximately 28–30% of studies did not clearly document whether esophagitis was present at diagnosis. Because active inflammation can obscure or mimic Barrett's mucosa, absence of standardized esophagitis reporting may further contribute to prevalence variability.

Overall, these findings underscore substantial heterogeneity in diagnostic methodology and reporting standards across studies. Although reporting quality has improved over time, incomplete documentation of biopsy protocols, EGJ definition, and endoscopic quality measures remains a major source of epidemiologic variability. Harmonization of BE definitions, consistent use of validated biopsy protocols such as the Seattle protocol, and standardized reporting of EGJ landmarks are essential to enhance comparability and reliability in future epidemiological research.

Discussion

Esophageal adenocarcinoma (EAC) continues to carry a poor prognosis, largely because it is frequently diagnosed at advanced stages. The 5-year overall survival rate for EAC remains below 20% in most populations, underscoring the clinical importance of identifying its precursor lesion, Barrett's esophagus (BE) (13). The present review provides an updated and comprehensive evaluation of the global epidemiology of BE in accordance with contemporary diagnostic frameworks. Unlike earlier summaries, this analysis systematically examined how prevalence estimates vary according to diagnostic definition, geographic region, time period, study design, and biopsy protocol. A notable finding is the persistent absence of reliable data from many countries, particularly in low- and middle-income regions. In several nations, reported prevalence exceeded anticipated levels, largely reflecting differences in case definitions and sampling methodology rather than true epidemiologic expansion. Considerable heterogeneity was observed across studies, reinforcing the need for harmonized reporting standards. The pooled mean prevalence across all included studies was approximately 5.76%, but this summary estimate conceals significant heterogeneity, with reported prevalence ranging from 0.06% to 37.4%. The large dispersion (SD ≈ 8.46%) highlights substantial methodological and population-level heterogeneity. When stratified by population type,

population-based cohorts demonstrated significantly lower median prevalence (≈1.2%) compared with symptomatic endoscopy cohorts (≈4.8%, p<0.001), emphasizing the influence of referral bias and clinical enrichment. Database-derived studies further illustrated this contrast, often reporting crude prevalence below 1%, likely reflecting differences in coding practices and ascertainment sensitivity rather than a lower biological burden of disease.

Diagnostic definition was a major determinant of prevalence variation. Requiring histologic confirmation of intestinal metaplasia (IM) yielded more conservative and reproducible estimates. Studies mandating IM for diagnosis demonstrated lower pooled prevalence compared with studies relying on endoscopic suspicion or columnar-lined epithelium without IM confirmation. The observed difference between IM-required and non–IM-required definitions (approximately 7–8% absolute difference in mean prevalence) underscores the substantial impact of case definition on epidemiologic interpretation. These findings are consistent with prior concerns that omission of IM as a diagnostic requirement inflates prevalence estimates and compromises comparability across regions. Study size also significantly influenced reported prevalence. Smaller cohorts, such as Nandurkar (15) (n=182; prevalence 36%) and De Freitas (16) (n=104; prevalence 3.8%), tended to report disproportionately high estimates, whereas large population-based datasets including Kim (17) (n=221,042; prevalence 0.22%) and Ping-Huei Tseng (18) (n=19,812; prevalence 0.06%) demonstrated substantially lower prevalence. This inverse relationship between sample size and reported prevalence points toward potential selection bias, referral bias, or increased precision and representativeness in large-scale cohorts. While large multicenter investigations such as Mark van Blankenstein (19) (n=21,899; prevalence 7.36%) and Ming Zhang (20) (n=139,416; prevalence 0.17%) provide valuable epidemiologic stability, heterogeneity remains driven by differences in diagnostic thresholds and population composition. Shiota et al. (21) conducted a systematic review examining the prevalence of Barrett's Esophagus (BE) in Asia, which revealed an estimated prevalence of 1.3% (ranging from 0.7% to 2.2%) within the general population, characterized by significant heterogeneity. This elevated prevalence may be attributed to the inclusion of studies focused on high-risk patients and those that identified BE without confirming intestinal metaplasia (IM). Additionally, the review encompassed studies that did not consider patients with a known diagnosis of BE, which contributed to the estimation of incidence. Notably, all studies included in this review were also part of our analysis. Qumseya et al. (22) performed a systematic review involving 47 studies that evaluated BE prevalence across various risk populations. Their analysis incorporated studies with fewer than 100 participants and those that excluded individuals with a known diagnosis of BE. Furthermore, the authors distinguished between the prevalence in populations without any risk factors (0.8%) and those aged 50 years and older (6.7%). It is important to note, however, that most studies in the first category had a mean or median age exceeding 50 years, while the studies in the latter group reported a mean age of 45 years.

Finally, extreme outlier estimates such as the 23% prevalence reported in GERD populations by Csendes et al. (14) illustrate how enriched symptomatic cohorts can markedly inflate prevalence relative to general populations. Inconsistent reporting of confidence intervals further complicates aggregation and interpretation, as some studies provide precise estimates (e.g., 95% CI: 0.73–1.85), while others omit uncertainty measures entirely. Collectively, these findings highlight that variability in BE prevalence is largely attributable to methodological factors rather than purely geographic differences. Standardized definitions, consistent biopsy protocols, and transparent reporting of endoscopic quality metrics are essential to reduce heterogeneity and improve the reliability of global epidemiologic comparisons.

Our analysis is limited by the various biases inherent in each study and the heterogeneity observed across studies, which influences the outcomes of our meta-analysis. Although the prevalence of Barrett's Esophagus (BE) differed depending on the definitions used, we have sought to present precise estimates that reflect the populations being studied (general versus GERD), the length of BE (any versus ≥1 cm), the application of the Seattle protocol, and the geographical factors involved.

This study has several limitations. First, the included studies employed varied definitions of Barrett’s esophagus, including differences in histologic

confirmation, minimum segment length, and endoscopic criteria, which may introduce misclassification bias. Second, publication bias is possible, as studies with significant results may be more likely to be published. Although we used funnel plots and Egger's test, subtle bias may persist. Third, the quality of included studies varied, and while we assessed methodological rigor using the Newcastle-Ottawa Scale (NOS), subjective elements of quality assessment could influence results. Lastly, the lack of uniform application of the Seattle protocol and inconsistent reporting of esophagogastric junction landmarks may further limit the comparability of findings across studies.

The results of this study underscore the significant influence that diagnostic definitions and demographic factors exert on the prevalence rates of Barrett's Esophagus (BE). This emphasizes the urgent need for a standardized, consensus-based methodology for diagnosing BE, which would facilitate more precise prevalence estimates on both global and regional scales. Future investigations should focus on aligning diagnostic criteria and reporting standards to minimize discrepancies and enhance comparability among research findings. Future investigations should be prospective and population-based or EGD-based, involving a minimum of 100 participants. These studies must adhere to the latest guidelines, which include defining BE as lesions measuring ≥1 cm and requiring histological confirmation of intestinal metaplasia, utilizing the Prague classification, following the Seattle protocol, and ensuring the absence of esophagitis. A precise understanding of BE prevalence will enable the development of more customized screening strategies and facilitate the evaluation of their effectiveness.

Conflict of interests

There is no conflict of interest for authors of this article.

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