

Quality of Life and Economic Burden of Advanced Non-Small Cell Lung Cancer in Medium and Small Markets: A Systematic Literature Review

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BACKGROUND

- Lung cancer is one of the most lethal malignancies globally, comprising 14% of all cancer cases and 18% of all cancer-related deaths¹
- Non-small cell lung cancer (NSCLC) accounts for over 80% of all lung cancer cases
 - A significant number of NSCLC patients are diagnosed at an advanced stage, resulting in overall survival periods of 9–34 months²
- Clinical trials are a crucial source of information for researchers studying patient quality of life (QoL) and economic burden (EB). However, these trials tend to favor enrollment from the top 9 (ie, large) pharmaceutical markets, encompassing more than 50% of all patients³
- The QoL and EB experienced by patients with advanced or metastatic NSCLC (aNSCLC) in medium-sized and small markets (Med&SM) remain poorly explored due to the limited research conducted in these regions

OBJECTIVES

- To delineate the humanistic burden of aNSCLC by examining QoL outcomes and EB in patients with advanced/metastatic NSCLC in Med&SM
- To assess any gaps in the existing literature on this topic

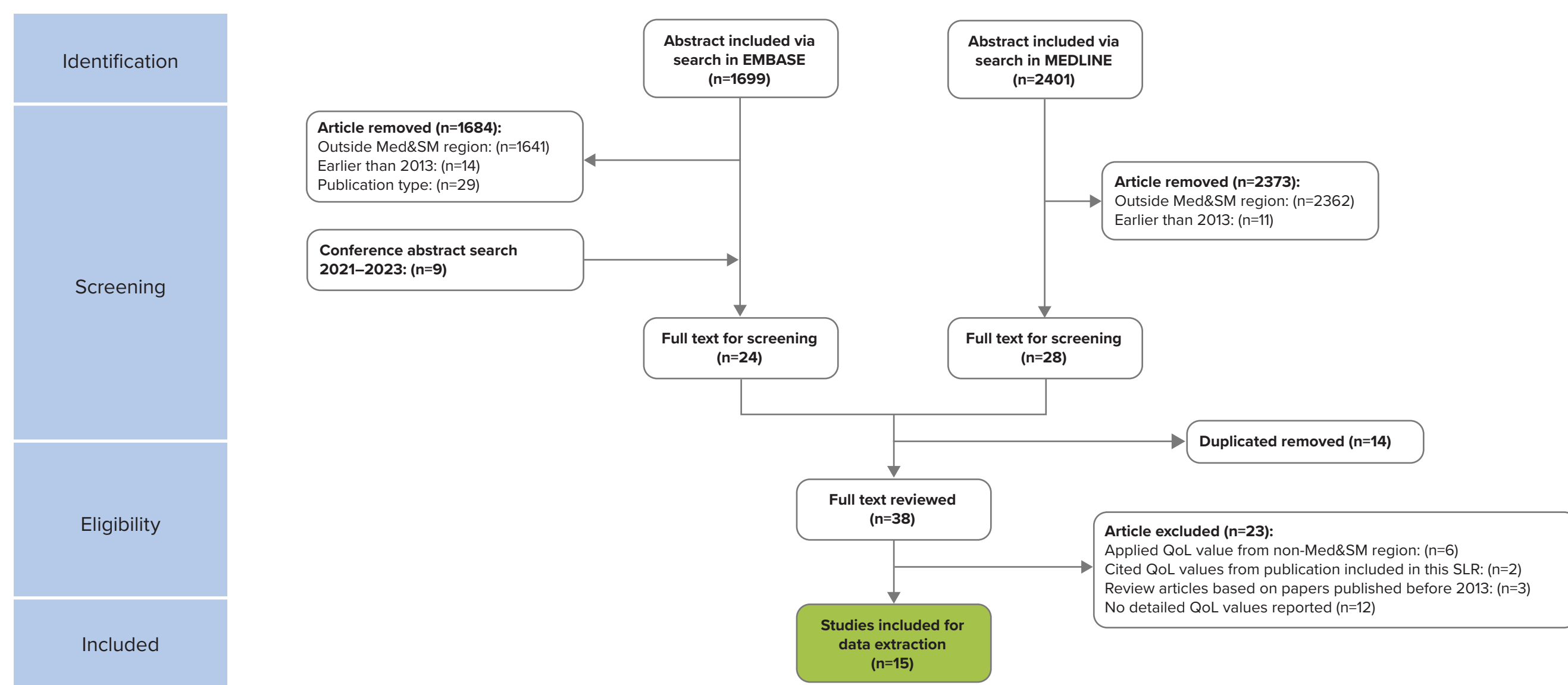
METHODS

- The systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The design and execution of this review were guided by the Population, Intervention, Comparison, Outcomes, and Study (PICOS) criteria:
 - Population:** Patients ≥18 years of age with aNSCLC (Stage III or IV)
 - Geographic regions: 14 countries were selected to represent the geographic and economic diversity of Med&SM: Argentina, Australia, Brazil, Indonesia, Israel, Malaysia, Mexico, New Zealand, Saudi Arabia, Singapore, South Korea, Thailand, Turkey, and United Arab Emirates
 - Interventions:** All interventions for aNSCLC were included
 - Comparison:** All interventions for aNSCLC were included
 - Outcomes:** Original data of the QoL or EB of patients with aNSCLC
 - Study types:** Prospective, retrospective, and cross-sectional studies
- Searches for English peer-reviewed journal articles and conference abstracts were conducted in EMBASE, MEDLINE®, including Epub Ahead of Print, In-Process & Other Non-Indexed Citations, MEDLINE® Daily, and MEDLINE® Versions
- Journal articles published January 2013–April 2023 and conference abstracts published January 2021–April 2023 were included
- 2 independent researchers conducted the screening and data extraction process. In the event of disagreements, a third reviewer was consulted to reach a resolution

RESULTS

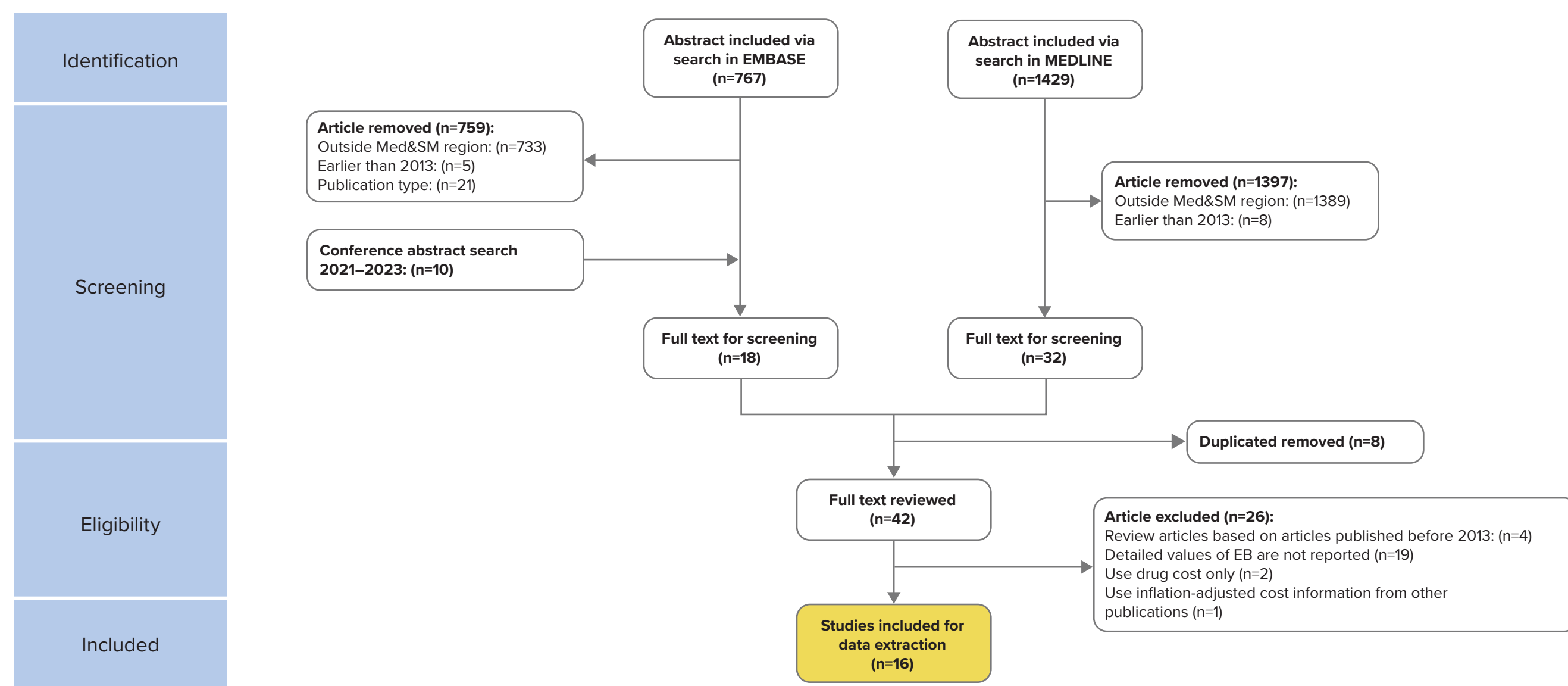
- 4100 publications were screened for QoL studies in patients with aNSCLC; 2196 publications were screened for EB studies in the same patient population
 - Among these, 15 manuscripts related to QoL and 16 manuscripts related to EB were identified and included in the final analysis (Figure 1 and Figure 2)

Figure 1: PRISMA Diagram for SLR on QoL for Patients With aNSCLC



aNSCLC, advanced or metastatic non-small cell lung cancer; Med&SM, medium-sized and small market; QoL, quality of life; SLR, systematic literature review.

Figure 2: PRISMA Diagram for SLR on EB for Patients With aNSCLC

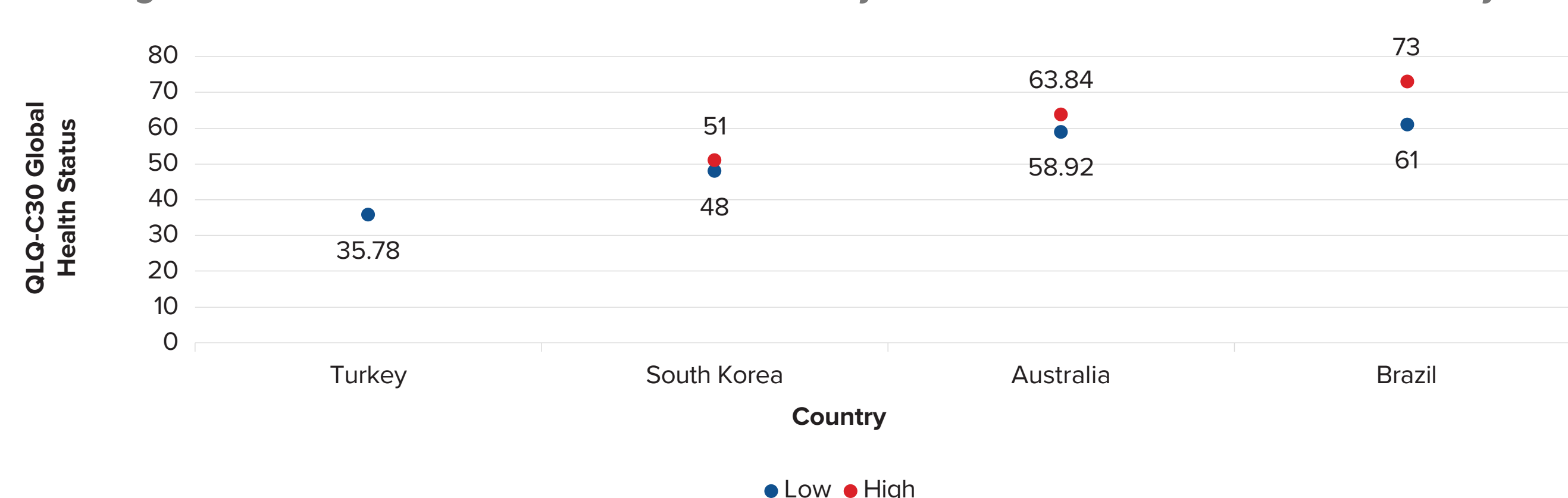


aNSCLC, advanced or metastatic non-small cell lung cancer; EB, economic burden; Med&SM, medium-sized and small market; SLR, systematic literature review.

QoL Outcomes

- We identified 15 studies that reported QoL information for 6 Med&SM countries: 5 for South Korea, 4 each for Australia and Turkey, 2 for Brazil, and 1 each for Indonesia and Thailand
 - All 6 countries have established health technology assessment processes
- Among the identified QoL studies, 7 were cross-sectional surveys, 4 were prospective observational studies, 3 were prospective randomized trials, and 1 was a retrospective study
- Validated QoL instruments were employed in 14/15 studies conducted in Med&SM countries, with QLQ-C30 being the most commonly used instrument, followed by EQ-5D, QLQ-LC13, and MDASI-LC
- Among the selected QoL studies, male patients with a history of smoking were the predominant demographic. The average age of participants was 55–70 years, with the majority in their 60s
- Diverse histological characteristics were reported, with adenocarcinoma and squamous cell carcinoma being the most frequently observed subtypes
- While the QoL data exhibited significant heterogeneity, making systematic comparisons challenging, a naïve comparison revealed substantial differences among patients with aNSCLC across countries (Figure 3). Notably, patients with disease progression experienced poorer QoL compared with those with progression-free disease (Figure 4)
- QoL generally declined with successive treatment rounds. Even at later stages, progression-free patients reported better QoL compared with those with disease progression (Figure 5)

Figure 3: Ranges of QLQ-C30 Global Health Status/Quality of Life Scores for aNSCLC Patients by Country⁴⁻⁸

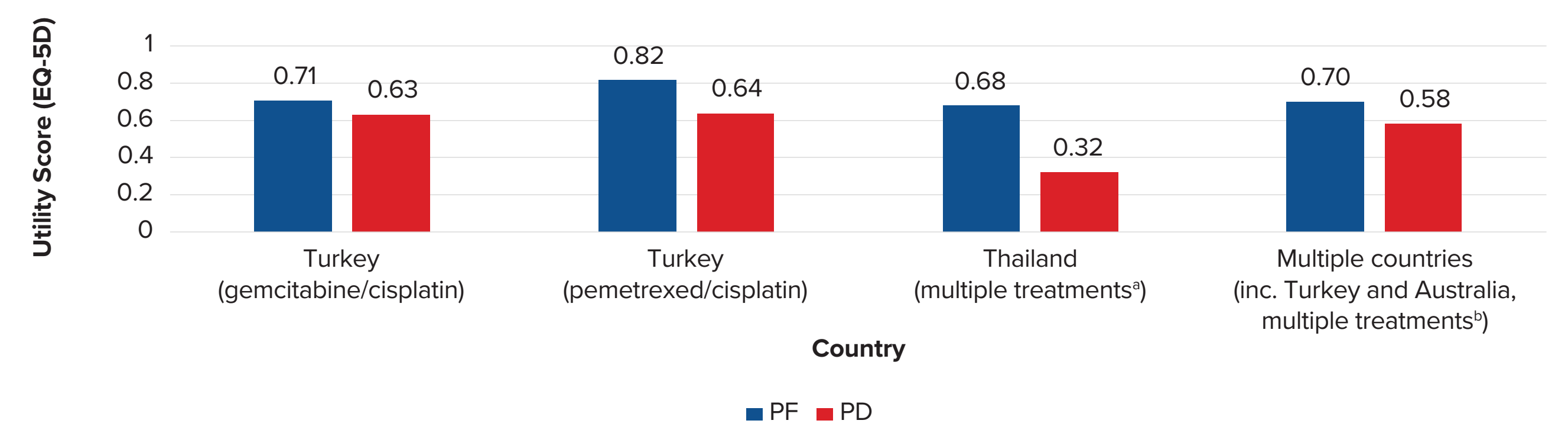


QLQ-C30 was created by the European Organization for Research and Treatment of Cancer (EORTC) to evaluate the QoL among cancer patients. A higher score with respect to the QLQ-C30 Global Health Status signifies a better quality of life. The terms 'high' and 'low' were used to represent the maximum and minimum QLQ-C30 Global Health Status scores reported within a given country. In cases where only a single score was accessible, it was categorized as 'low'. QoL, quality of life.

CONCLUSIONS

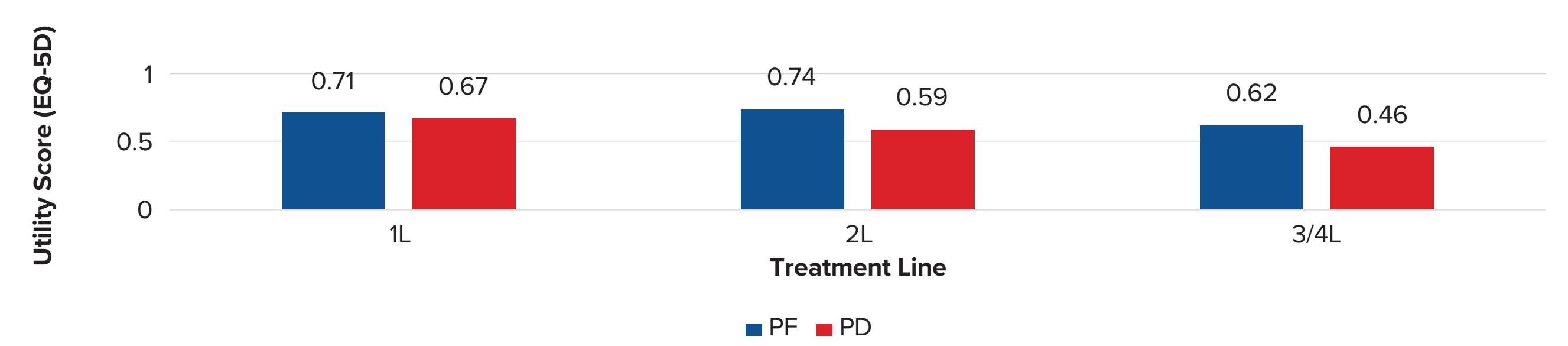
- Systematic assessment of QoL and EB in aNSCLC patients within Med&SM is challenging due to the limited data available. Nevertheless, it is evident that aNSCLC substantially impacts QoL and healthcare expenditures in these markets
- Preventing disease progression improves patient QoL, and the introduction of novel treatments for aNSCLC may potentially enhance patient QoL and reduce the EB

Figure 4: Comparison of Utility Scores by Disease Status⁹⁻¹²



EQ-5D is a standardized questionnaire developed by the EuroQol Group to measure health-related QoL. Patients were treated with platinum doublets or tyrosine kinase inhibitors (gefitinib, erlotinib, or afatinib). Results were based on patients on unspecified 1st to 4th lines of treatments. PD, progressive disease; PF, progression-free; QoL, quality of life.

Figure 5: Utility Score by Lines of Treatment in a Multi-Country Study⁹

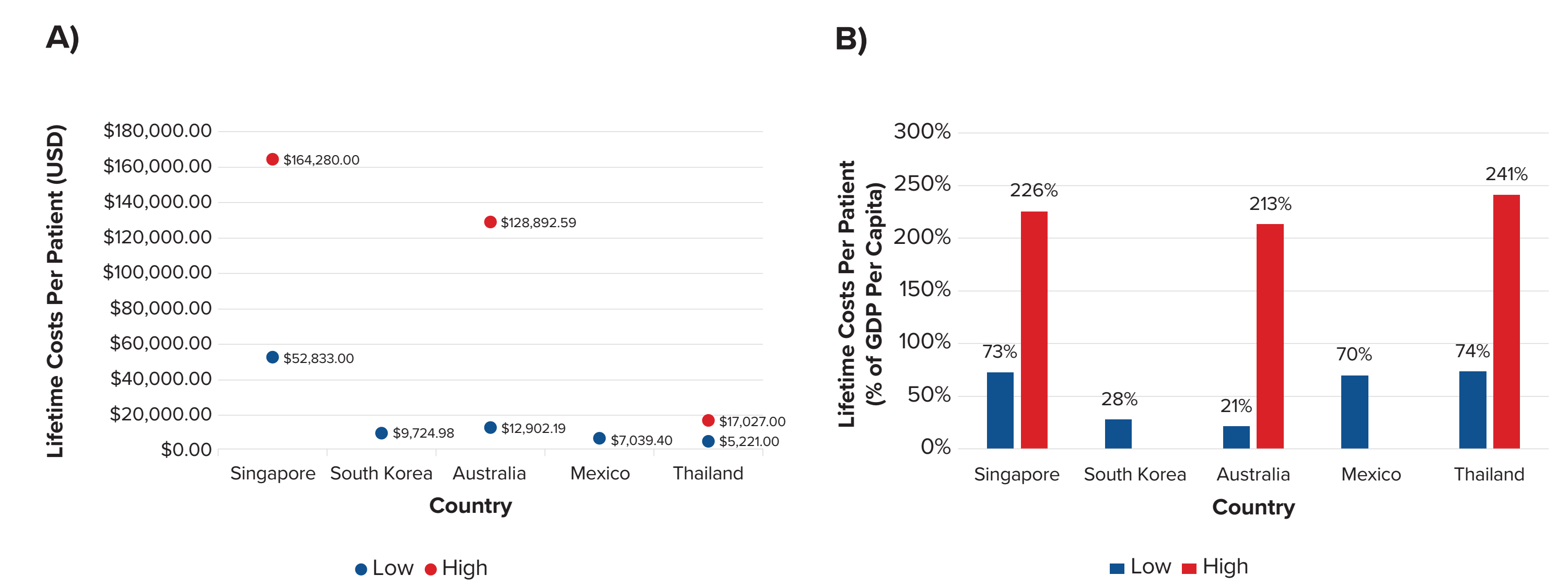


EQ-5D is a standardized questionnaire developed by the EuroQol Group to measure health-related QoL. Australia and Turkey were included in this study. EQ-5D utility scores were not reported by countries. 1L, first-line treatments; 2L, second-line treatments; 3/4L, third- or fourth-line treatments. PD, progressive disease; PF, progression-free; QoL, quality of life.

EB Outcomes

- EB data based on original research were reported for 6 countries: Singapore, South Korea, Australia, Mexico, Thailand and Turkey
 - All 6 countries have established health technology assessment processes
- 9 of 16 identified EB studies described health economic models, while 6 of the remaining 7 were retrospective studies
 - These EB studies relied on government-published price listings, existing medical claims, hospital databases, and/or expert interviews to estimate the cost of managing aNSCLC
- Med&SM countries exhibit significant differences in their national economic development. When converting the EB of aNSCLC into US dollars (USD), there were substantial cost variations between these countries (Figure 6A and Figure 7A)
 - Lifetime costs per patient in Med&SM varied from \$5,221 USD in Thailand to \$164,280 USD in Singapore, depending on the treatment and country
- When the costs per patient were expressed as a percentage of GDP per capita, the lifetime management cost ranges of aNSCLC exhibited greater consistency across countries, primarily falling within 70% to 240% of GDP per capita (see Figure 6B)
- Singapore and South Korea had lower annualized aNSCLC costs in comparison with Mexico and Thailand (Figure 7B)

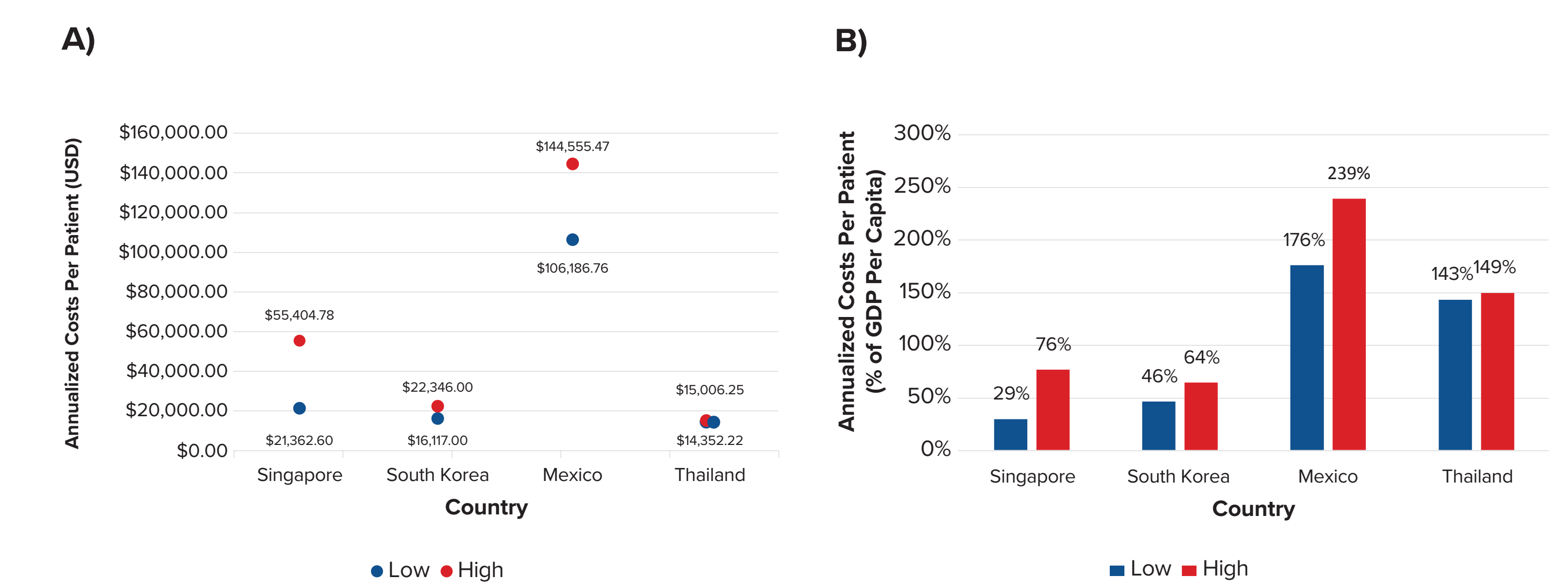
Figure 6: Lifetime Costs Per Patient of Managing aNSCLC by Country A) in USD and B) by % of GDP Per Capita^{7,8,10-16}



Lifetime costs per patient of treating aNSCLC in USD. Conversion to USD was based on the exchange rates published on 4/5/2023. The terms 'high' and 'low' were used to represent the maximum and minimum costs reported within a given country. In cases where only a single cost was accessible, it was categorized as 'low'. aNSCLC, advanced or metastatic non-small cell lung cancer; USD, US dollar.

Lifetime costs per patient of treating aNSCLC as percentages of 2021 GDP per capita. The terms 'high' and 'low' were used to represent the maximum and minimum costs reported within a given country. In cases where only a single cost was accessible, it was categorized as 'low'. aNSCLC, advanced or metastatic non-small cell lung cancer; GDP, gross domestic product.

Figure 7: Annualized Costs Per Patient of aNSCLC A) in USD and B) by % of GDP Per Capita¹⁷⁻²³



Annualized costs per patients of treating aNSCLC in USD. Conversion to USD was based on the exchange rates published on 4/5/2023. The terms 'high' and 'low' were used to represent the maximum and minimum costs reported within a given country. In cases where only a single cost was accessible, it was categorized as 'low'. aNSCLC, advanced or metastatic non-small cell lung cancer; USD, US dollar.

Annualized costs per patient of treating aNSCLC as percentages of 2021 GDP per capita. The terms 'high' and 'low' were used to represent the maximum and minimum costs reported within a given country. In cases where only a single cost was accessible, it was categorized as 'low'. aNSCLC, advanced or metastatic non-small cell lung cancer; GDP, gross domestic product.

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DISCLOSURES

M-JA: Consulting fee from AstraZeneca, Yuhon, Takeda, MSD, Amgen, Daiichi-Sankyo, Roche, Alpha Pharmaceuticals, Janssen, Voronoi, DTSW, Travel fees from Pfizer, Boehringer Ingelheim, and Roche; honoraria from Bristol-Myers Squibb, Takeda, Novartis, Roche, and Pfizer; research funding (Inst) from Novartis, GSK, and AstraZeneca; consulting fees from Novartis, Merck, Loxo, AstraZeneca, Roche, and Pfizer; JCC, LZ, and RW: Employed and hold stock at BeiGene; YH: Consulting fee from Vincent Strategies LLC.

ACKNOWLEDGMENTS

Medical writing support, under the direction of the authors, was provided by Steven Moore, PhD, and Renee Granger, PhD, of Envision Pharma Group, and was funded by BeiGene

