Variability in Health Utility Scores in Pancreatic Cancer: Findings from a Targeted Literature Review

PCR 264

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INTRODUCTION

- Pancreatic cancer (PC) is an aggressive malignancy with rapid progression, poor prognosis, and a significant impact on quality of life.
- Health state utility values (HSUVs) are vital for quantifying this burden and informing cost-effectiveness and HTA models.
- Existing HSUV evidence is fragmented and largely limited to metastatic settings.
- Variability driven by causal factors such as differing instruments, mapping methods, and stage definitions leads to inconsistent and non-comparable estimates.
- This evidence synthesis consolidates HSUV data across disease stages and treatments to address variability and strengthen reliability for pancreatic cancer value assessments.

OBJECTIVE

To synthesize existing HSUV evidence across pancreatic cancer disease stages and treatment settings, addressing variability in estimates and enhancing their reliability for use in value and cost-effectiveness assessments.

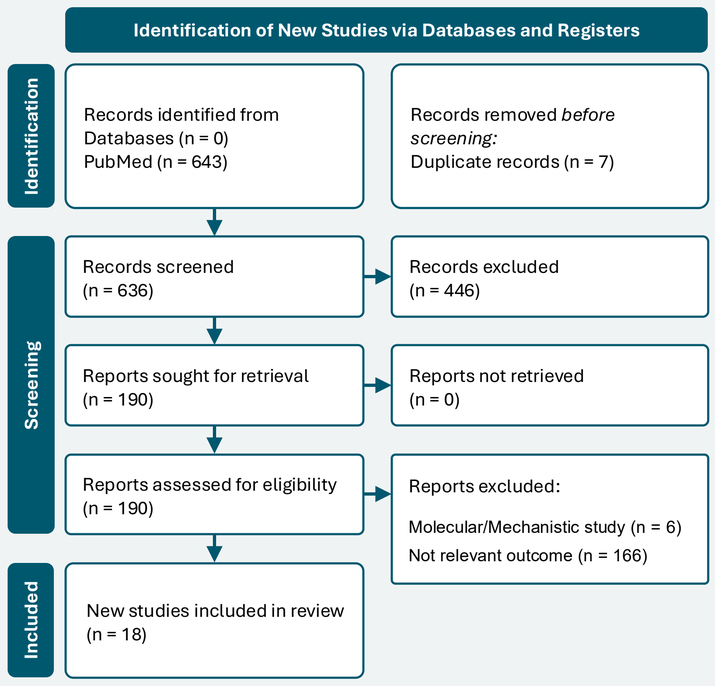
METHODS

- Evidence Synthesis Type: Targeted literature review
- Databases: PubMed
- Grey Literature: ISPOR (2020–2025)
- Search used terms: “pancreatic cancer,” “health utility,” “quality-adjusted life year”, “health-related quality of life”

Category	Inclusion Criteria	Exclusion Criteria
REPORT CHARACTERISTICS		
Publication Year	Studies published between **2020–2025**	Studies published **before 2020**
Language	**English-language** publications	Non-English publications
Study Type	**Clinical trials, observational studies, systematic reviews, and model-based economic evaluations**	Narrative reviews, editorials, commentaries, conference abstracts without full data
Publication Status	**Peer-reviewed** journal articles or conference proceedings with extractable data	Grey literature, unpublished reports, or non-peer-reviewed sources
Study Availability	**Full-text accessible** for data extraction	Abstract-only records or inaccessible full texts
RECORD CHARACTERISTICS		
Patients	Adults (≥18 years) with confirmed diagnosis of pancreatic cancer (any stage)	Studies focusing exclusively on other cancer types
Intervention / Comparator	Any clinical management relevant to pancreatic cancer, including surgery, chemotherapy, radiotherapy, supportive care, or no treatment	NA
Outcomes	Health utility scores or indices derived from validated instruments (e.g., EQ-5D, SF-6D, HUI, QLU-C10D), mapped utilities, or QALY estimates	Studies reporting only clinical outcomes without utility or HRQoL data

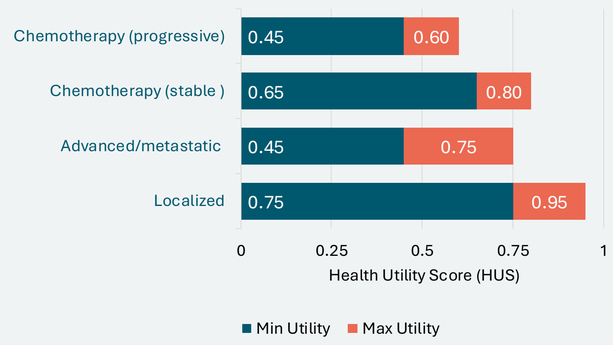
- Two-stage PRISMA screening conducted, with eligible full texts reviewed for data extraction.
- Key variables extracted: study design, population, disease stage, HRQoL instrument, estimation method, and reported HSUVs (mean/range).
- Descriptive synthesis performed; meta-analysis not conducted due to heterogeneity across studies.
- Studies stratified by disease stage (localized, advanced, metastatic) and intervention type (surgical, systemic, palliative); utility values reported as published.

RESULTS



Small sample predominance
Observational studies prevalent

Utility Values by Disease Stage and Treatment in PC



- **Localized disease**: High utilities (≥0.80) post robotic/laparoscopic surgery. QoL recovery is rapid and sustained.
- **Advanced/metastatic disease:** Broad range (0.45–0.75) due to treatment toxicity and modeling assumptions. Real-world burden may be underestimated.
- **Stable chemotherapy:** Moderate-to-high utilities (0.65–0.80). Patients maintain daily function during disease control, especially in BRCA+ maintenance.
- **Progressive disease:** Lower scores (<0.60), often modeled. Reflects symptom escalation and functional decline; estimates carry uncertainty.

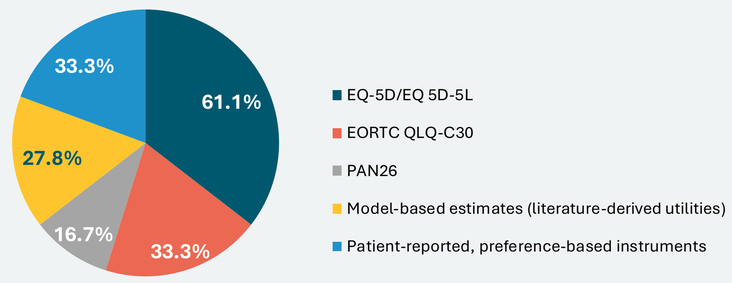
- Studies spanned Asia, Europe, and North America, showing broad global representation.
- **Geographic spread**: Strong representation from USA (4), Japan (2), Canada (2), and Europe (3)
- Evidence clustered in high-income, data-rich regions with established research infrastructure.

Median sample size 170 (IQR 60–1,988); 60% direct patient-reported utilities.

Author (Year)	Population Type	Instrument(s)	Reported Utility Value(s)
Hino et al., 2025	Unresectable advanced PC	EQ-5D-5L	0.45–0.65 (mean 0.55)
Long et al., 2025	K-Ras wild-type locally advanced/metastatic PC	EQ-5D (trial-based)	0.70 (stable), 0.50 (progressive)
Seelen et al., 2024	Locally advanced PC	EORTC QLQ-C30	Non-preference-based instrument
Tushoski-Alemán et al., 2024	Mixed PC populations (RCTs)	Multiple (EQ-5D, EORTC, FACT)	Range: 0.40–0.85 across studies
Smith et al., 2025	Suspected mucinous cystic neoplasm	EQ-5D (external source)	0.85 (premalignant)
De Pastena et al., 2024	Mixed pathology post-surgery	EQ-5D, QLQ-C30	0.80–0.90 (RDP), 0.75–0.85 (LDP)
Guerrero-Ortiz et al., 2024	Post-surgical PC (RDP vs LDP)	EQ-5D	0.85 (mean)
Fukushima et al., 2024	Mixed cancer patients	EQ-5D, QLQ-C30, SF-36	PC-specific range: 0.50–0.80
Lee et al., 2024	Post-surgical PC (PD or DP)	EQ-5D (NHIS data)	0.78 (PD), 0.82 (DP)
Joseph et al., 2024	Resected pancreatic/ peripancreatic cancer	QLQ-C30, PAN26	Non-preference-based instrument
Peters et al., 2024	High-risk individuals (BRCA, STK11, etc.)	Age/sex-specific utilities	0.90 (no disease), 0.60 (advanced PC)
Hiroshima et al., 2023	Unresectable locally advanced PC	Expert opinion + EQ-5D	0.55 (progressive)
Mirzayeh Fashami et al., 2023	BRCA-mutated metastatic PC	EQ-5D (Canadian)	0.65 (maintenance), 0.50 (progressive)
Arjani et al., 2023	Resectable pancreatic adenocarcinoma	Published EQ-5D values	0.80 (post-surgery)
Ding et al., 2022	Patients treated with PARP inhibitors	Mixed (EQ-5D, trial-based)	0.60–0.75 (range)
Arciero et al., 2022	Advanced PC (Gem-Nab vs FOLFIRINOX)	EQ-5D (published value)	0.55 (Gem-Nab), 0.50 (FOLFIRINOX)
Amin et al., 2022	BRCA-mutated metastatic PC post-chemotherapy	QLQ-C30	Non-preference-based instrument
Toms et al., 2021	Post-surgical PC patients	15 instruments	Instrument heterogeneity; insufficient for utility derivation

Abbreviations: PC – Pancreatic Cancer; LA – Locally Advanced; mPC – Metastatic PC; RDP/LDP – Robotic/Laparoscopic Distal Pancreatectomy; PD/DP – Pancreaticoduodenectomy/Distal Pancreatectomy; MCN – Mucinous Cystic Neoplasm; BRCA/STK11 – Cancer-related gene mutations; EQ-5D/5L – EuroQol 5-Dimension (5-Level); SF-36 – Short Form-36; QLQ-C30/PAN26 – EORTC Quality of Life tools; FACT – Functional Assessment of Cancer Therapy; NHIS – National Health Insurance Service; QALY – Quality-Adjusted Life Year; HTA – Health Technology Assessment; RCT – Randomized Controlled Trial.

Distribution of Measurement Instruments in Pancreatic Cancer Utility Studies



EQ-5D most used (61%); others include QLQ-C30, FACT, PAN26, and mixed instruments

HUS Variability Means

- In PC studies, instrument differences (EQ-5D vs SF-6D) yield non-equivalent utility scores, hindering synthesis across sources.
- Inconsistent disease-stage definitions in PC research leading to overlapping and non-comparable utility estimates.
- Many PC utilities estimates are derived from modeled or real-world data, limiting accuracy especially in advanced disease stage.
- Variability in PC affects QALY calculations and HTA decision-making; highlighting need for standardized measurement.

DISCUSSION

- Predefined inclusion criteria and data extraction supported methodological transparency and reproducibility.
- Variation in measurement instruments and incomplete reporting reduced cross-study consistency in PC health utility scores.
- Higher HUS in localized PC likely reflect better post-surgical recovery and preserved function.
- Lower values in metastatic disease correspond to greater symptom burden and treatment-related toxicity.
- Model-derived HUS in PC studies often differ from patient-reported values, reflecting variations in data sources, assumptions, and mapping algorithms.
- Additional uncertainty stems from small and heterogeneous samples, inconsistent QoL-to-utility conversions, and regional differences in value set application.
- These factors directly affect the precision of cost-utility models and the reliability of HTA interpretations in PC.
- Greater methodological alignment and use of stage-specific, patient-level data are needed to strengthen the validity and comparability of PC utility estimates.

LIMITATIONS

- Scope restricted to 2020–2025 and English-language publications
- Targeted (not systematic) approach may omit older or non-indexed studies
- Heterogeneity prevented quantitative synthesis or uncertainty modeling

CONCLUSION AND RECOMMENDATIONS

- HUS for PC patients shows substantial variation across disease stages and treatments settings.
- Only about one-third of studies used validated preference-based instruments.
- Methodological inconsistency and heterogeneity limit reliability of cost-utility analyses and health technology assessments.
- Clinicians and policymakers should interpret HUS data in the context of PC disease stage, treatment modality, and underlying data source to ensure appropriate application in clinical and economic decision-making.
- Standardized, preference-based HUS measurement and reporting of HUS are needed in PC to enable consistent comparison and reliable use in economic evaluations.
- Future studies should adopt validated instruments and transparent methods to improve comparability.

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