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Thresholds for the value judgement of health technologies in the United Arab Emirates: a consensus approach through voting sessions

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ABSTRACT

Background In the evolving healthcare landscape of the United Arab Emirates (UAE), establishing cost-effectiveness thresholds (CETs) is pivotal to informing decision-makers about the value of health technologies.

Objective This study aimed to establish CETs for the UAE that harmonise with international standards while reflecting the nation's unique healthcare needs and economic context.

Setting United Arab Emirates.

Methods A multitiered methodology was employed, involving a literature review, a panel of national experts and workshops with key stakeholders, including healthcare providers, government health departments and healthcare payers. The panel and workshops were integral in assessing global CET practices and their applicability to the UAE providing a preliminary framework for CET in the UAE. Structured voting sessions were then conducted allowing voting on crucial aspects of CET to determine the baseline threshold, multipliers for severity, rarity and health gain, and methodologies for quantifying disease severity.

Results CETs were linked to the economic status of the UAE, with a baseline threshold of 0.75 times the gross domestic product per capita for one quality-adjusted life year gained. A multiplier system was introduced to reflect societal views on disease severity, disease rarity and the relative health benefit of health technologies. Based on the voting results, disease rarity was deemed the most crucial factor, receiving a maximum multiplier of 3X, while severity and health gain were assigned a maximum of 2X. The multiplier values for both disease severity and relative health gain would be determined on a continuous scale. The proportional or relative shortfall method would be used to assess disease severity.

Conclusions The proposed CET framework for the UAE will be dependent on local generation of cost-effectiveness evidence. Periodic review of CETs based on initial experiences ensures the responsiveness of policymakers to the changing healthcare and economic environment.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A robust, multitiered approach was employed combining a literature review, expert panels and stakeholder workshops.
⇒ Diverse stakeholders enriched the discussion and grounded the recommendations in practical considerations.
⇒ The voting sessions enhanced decision-making clarity and consensus among stakeholders.
⇒ Experts were selected through convenience sampling with this approach adopted due to the limited number of health technology assessment experts in the United Arab Emirates.

INTRODUCTION

The United Arab Emirates (UAE) is considered a rapidly developing and dynamic player in the global healthcare market. Its healthcare system is characterised by a mix of private and public sector entities, with a diverse range of stakeholders contributing to its governance.[1] This diversity introduces a challenge for the establishment of a centralised health technology assessment (HTA) process, primarily due to fragmentation among numerous payers, which might lead to uneven implementation of HTA across the healthcare system.[2]

Despite these challenges, significant efforts have been made in advancing HTA in the UAE. The Department of Health (DoH) in Abu Dhabi has played a pivotal role by setting up an HTA unit and creating a platform for companies to present the value of their technologies.[3] Complementing this, a recent study described a potential roadmap for HTA implementation where a key objective would be to harmonise processes among the various HTA agencies within the country (in press).

The UAE, known for its eagerness to embrace innovation in healthcare, has experienced a significant increase in healthcare spending in recent years.[2] According to Ahmad *et al*,[2] and reported by the UAE's Ministry of Finance, this expenditure was

expected to climb from US$21 billion by the end of 2021 to an estimated US$26 billion by 2025.[2]

In response to rising healthcare costs and the goal of maintaining high-quality healthcare without compromising the sustainability of the healthcare system, HTA has become pivotal in informing policymakers on the value of healthcare technologies. Economic evaluation is a core component of HTA, which helps to judge the economic value of medical technology by quantifying its health gain and incremental cost to a widely used comparator technology, then comparing the incremental cost-effectiveness ratio (ICER) with the willingness to pay threshold value for a unit of health benefit.[4]

Cost-effectiveness threshold (CET) is defined as the maximum acceptable incremental costs for a standard unit of health benefit, which is typically expressed in terms of quality-adjusted life years (QALYs) or disability-adjusted life years.[4] A health technology is considered cost-effective—in other words 'good value for money'—if its ICER falls below this threshold. Conversely, it is deemed not cost-effective if ICER exceeds CET.[4]

In light of the above-mentioned challenges, the establishment of CETs in the UAE is becoming increasingly important. Such thresholds would guide the allocation of resources towards the most cost-effective healthcare technologies, and ensure the efficient use of funds in an era of rapid medical innovation and demographic shifts. This study aims to establish CETs in the UAE by exploring international trends for CET values.

Several methods exist for establishing CETs. The precedent method is one, which determines the threshold based on the incremental cost of already funded technologies or historical resource allocation decisions, such as the treatment costs for end-stage renal disease.[5 6] Another method is to survey the willingness to pay of society for an additional life year in perfect health.[4] Additionally, estimating the value of statistical life is also considered.[4 7] A key approach, particularly relevant to opportunity cost, involves using a fixed budget to create a 'league table'.[7] In this method, health technologies are ranked according to their ICER values. Technologies with lower ICERs are prioritised for funding, and this continues until the allocated budget is fully used. Finally, a widely used approach is to link the threshold to the country's gross domestic product (GDP) per capita. This rule of thumb is the most common practice in majority of countries.[5 8]

Several countries use multiple thresholds to assess the value of different types of technologies.[9–12] This approach of employing different thresholds is often influenced by factors such as the severity of the disease, the rarity of diseases, disease areas (eg, oncology) and others. More severe diseases have a higher threshold than less severe ones and rare diseases have a higher threshold than more common diseases.[9 10 13 14] This strategy aims to promote equitable treatment access, ensuring that patients with rare diseases can receive necessary treatments despite potentially higher costs. For instance, in the UK, the typical threshold ranges from £20 000 to £30 000 per QALY. However, for ultrarare diseases, particularly those treated with genetic therapies, the threshold can reach up to £300 000 per QALY, depending on the extent of the QALY gained.[12]

Establishing a CET in the UAE is a strategic step towards maintaining the balance between cost containment and the delivery of high-quality healthcare, reflecting the country's commitment to fostering a sustainable and efficient healthcare system in line with global standards. A consensus-based approach was chosen considering diverse perspectives to reach more robust and widely accepted outcomes. The consensus approach aims to gather insights from a broad spectrum of stakeholders, including healthcare professionals, and policymakers, with a focus on establishing a CET that is both relevant and applicable to the national level. The study aims to establish a CET in the UAE by analysing CET values in various countries and exploring global trends in CET, particularly in the context of adopting multiple thresholds.

METHODS

To provide a recommendation for CET, we adopted a comprehensive and multifaceted approach, designed to build on experiences from other countries, yet tailored to the local healthcare system. Initially, we presented a literature review on CETs by Fasseeh *et al*[15] to a panel of national experts, fostering informed dialogue on the relevance of global trends of CET to the UAE context. This panel was tasked with outlining a set of recommendations for the development of the CET framework in the UAE. After this, we engaged in further dialogues with local experts through workshops to explore ways to translate the recommendations developed by panellists into a preliminary CET framework. Next, a series of structured voting sessions with local experts were conducted to vote on crucial aspects of the CET, thereby transforming the preliminary framework into a solid CET framework suitable for the UAE context.

This approach to establishing CET, which involved a national expert panel, discussions with local experts and voting sessions, was previously employed by Fasseeh *et al* to determine the CET value in Egypt.[15] The following sections will detail the specifics of the national expert panel, the literature review presented to them, the subsequent workshops and discussions with experts and the details of the voting sessions conducted. The protocol employed for this study was not registered.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Literature review

Fasseeh *et al* identified countries that have established CETs by using a comprehensive list of HTA agencies, as compiled by WHO.[16] The list was further complemented

with data from EUnetHTA and the International Network of Agencies for Health Technology Assessment, including 113 HTA agencies across 63 countries.

The review focused on the threshold values and their underlying basis. Additionally, CETs were classified based on their type—explicit or implicit—and the review considered variations in how these thresholds were reported, such as whether they were presented as a single-point estimate or as a range. This enabled cross-country and regional comparisons, shedding light on the diversity of CET applications.

Moreover, multiple CETs were reviewed focusing on the threshold values, the country specifics, the year of implementation and the underlying basis for employing multiple thresholds. This comprehensive approach provided a broad understanding of how CETs are applied globally, including the existence of multiple thresholds in certain countries.

National experts' panel

Study settings and study design

The panel was held on the 19 October 2022 in Dubai and ran in conjunction with the annual Emirates Health Economics Society (EHES) conference, providing fertile ground for multidisciplinary dialogue.

Participant characteristics

The expert panel comprised decision-makers and national experts with extensive experience in the UAE healthcare system. To ensure that a comprehensive range of perspectives and expertise was represented, an array of critical sectors such as government health departments, healthcare providers and insurance companies participated in the expert panel, which was facilitated by an international professor in health economics. Experts were chosen through convenience sampling, adhering to specific inclusion criteria: possessing a solid understanding of HTA, representing various public entities, representing the private sector, having >10 years of experience, holding senior positions and being key influencers within the healthcare system of the Emirates.

Seven national experts affiliated with the EHES, the DoH, Dubai Health Authority, Abu Dhabi Health Services Company (SEHA), Abu Dhabi Executive Office, Rafed and Emirates Health Services participated in the panel discussion.

Process

The panel started with a presentation and discussion of the findings of a previously conducted literature review about the CET practice in other countries.[15] During the discussion, several key aspects from the review findings were explored including the base of the threshold, its range and differentiation. Initially, the basis for setting CETs was linked to either the GDP per capita, the average salary, the National Institute for Health and Care Excellence (NICE) threshold or an undefined basis. The conversation then transitioned to the threshold range, considering if countries adopt a single threshold value or employ a range based on specific criteria, thereby introducing multiple thresholds. Within the context of multiple thresholds, examples from countries like the UK, the USA, the Netherlands, Norway and Hungary among others were introduced.[9 12 14 17] These examples highlighted the underlying criteria for setting multiple thresholds, including considerations like the severity and rarity of diseases, the relative health gains from health technologies or the distinction between public and private sector thresholds. The details and analysis of the literature review can be accessed in the work of Fasseeh *et al*.[15]

Deep-diving into the criteria for multiple thresholds, methods for evaluating these criteria were introduced, including the absolute shortfall (AS) and proportional or relative shortfall (PS) for assessing disease severity.

Methods for assessing disease rarity included international definitions by regulatory bodies like the Food and Drug Administration (FDA) or the European Medicines Agency (EMA). As for relative health benefits, incremental relative QALY gained (IRQG) was discussed.

The discussion also covered the typology and functionality of CETs, differentiating between implicit and explicit thresholds. While implicit thresholds are employed by authorities or governments, they are not publicly disclosed. The application of CET as either a definitive rule or a flexible tool was further explored. 'Hard' CETs are enforced as strict rules, denying reimbursement for technologies if their ICER exceeds the threshold. Conversely, 'soft' CETs are approached as negotiable tools, allowing for discussions on price adjustments for reimbursement if ICER exceeds CET.

Panel discussion

Following the overview of the CET findings based on the literature review, the localisation of CET was highlighted, emphasising the need for establishing CETs through the collective efforts of local stakeholders to enhance patient access to essential health technologies.

The panel discussion mainly covered three main topics: the basis of the threshold, the application of multiple thresholds and the underlying basis for adopting these multiple thresholds. During the panel discussion, comprehensive notes were taken to capture the key points shared by the participants. These notes were then consolidated by the research team, who presented them back to participants for review. This process resulted in an initial set of recommendations, which was shared with the participants to confirm consensus on the discussed elements.

Recommendations provided by the expert panel resulted in the creation of a draft CET framework. The draft CET framework was further refined through multiple discussions conducted through a workshop between the research team and local experts in the field. These discussions aimed to further refine and elaborate on the initial recommendations, transforming the draft

into a more detailed preliminary framework that would be suitable for the development of CET in the UAE.

Voting sessions

Study settings and study design

Two face-to-face voting sessions took place in Dubai and Abu Dhabi on 15 May 2023 and 25 October 2023, respectively to reach consensus on the final values for CET, thereby establishing a practical framework for CET implementation. Anonymous live voting was conducted through a survey using Mentimeter software[18] and no pilot testing was conducted.

Participant characteristics

Participants were selected through convenient sampling. Due to the country's small population and the limited proportion of healthcare professionals, particularly those in the public sector, almost all experts in the field were included through invitations extended by local stakeholders. Invited stakeholders were required to possess good knowledge of HTA, belong to the public sector, have over 10 years of experience, hold senior positions and be actively involved in the healthcare sector. Participant characteristics are detailed in online supplemental table S1.

Process

The voting sessions were led by an international expert with over 20 years of vast experience in health economics and health policies. The expert's role was to explain the voting options without influencing the participants' responses. The survey required voting on five concepts: (1) the value of the baseline threshold compared with the GDP per capita, (2) the maximum multiplier for each of the three criteria: rarity, severity and health gain, (3) the approach to use when determining the multiplier of the relative health gain, (4) the method used to measure disease severity and (5) the approach to use when translating the severity value into a multiplier.

As the base GDP per capita choices were provided on an ordinal scale with equidistant intervals, the median value was used to provide a fair representation of all the results. Regarding the multipliers for the three criteria of rarity, severity and health gain, the voting was divided into two steps. Initially, we need to determine whether all the multipliers will be two (2×2×2), whether only one category will be three (3×2×2) or if two categories will be three (3×3×2). The selection of multiplier values was guided by internationally observed multipliers to prevent setting the threshold excessively low or high. If the participants' choice is to differentiate between multipliers (selecting at least one to be 3X), then the next question would assess which criterion would have the higher multiplier.

Furthermore, the participants had to choose which scale to use in determining the IRQG multiplier: a continuous scale, where the IRQG value is directly proportional to its multiplier, or a categorical scale, where different ranges of IRQG values are categorised, with higher ranges receiving higher multipliers.

Then, participants chose between two methods for measuring disease severity: AS and PS methods. AS measures the direct loss of QALYs due to an illness, giving an advantage to younger populations with higher expected QALYs. Meanwhile, PS considers the relative difference in QALYs, adjusting for life expectancy and removing age bias.[19] For determining the severity multiplier, continuous and categorical approaches were suggested once again for participants to choose one. Participants were also allowed to propose additional response items whenever they found it reasonable. The response that received the highest number of votes for each question was designated as the consented response except for the baseline GDP per capita multiplier where median values were used.

The survey was designed to follow a flowchart-like structure, where subsequent questions were presented based on participants' previous answers. In cases where the participant's answer changes, the flow of the survey will be adapted to the response. This approach aimed to ensure the relevance of the questions and coherence of the voting process.

RESULTS

National experts' panel

National experts highlighted the importance of aligning the UAE's CET with established global practices and tailoring it to the specific healthcare needs and economic context of the country. They also highlighted the necessity of generating local evidence to support accurate decision-making.

The panellists agreed that CET should determine the maximum willingness to pay in the UAE for one standard unit of health gain, expressed in QALYs. CET should be linked to the country's economic status, using GDP per capita as a metric. The willingness to pay for a QALY gained would be adaptive and vary according to three main aspects: (1) the relative health gain of a health technology, measured by IRQG, (2) disease severity and (3) disease rarity.

The panellists recommended determining rare diseases according to international standards primarily based on the EMA and/or the FDA definitions. They agreed on the need for a CET framework that is both precise and flexible enough to address the intricacies of disease prevalence. Accordingly, rare diseases will be differentiated from ultrarare diseases, with the latter not being subject to mandatory economic evaluation for making treatment decisions at the individual patient level. The panel also acknowledged that the threshold should be uniform across public and private healthcare sectors to promote equity in access to health technologies regardless of the sector. This decision was driven by the need to maintain a cohesive health economic policy and to facilitate a fair healthcare system.

Box 1 Expert panel recommendations*

⇒ The cost-effectiveness threshold (CET) should determine the maximum willingness to pay in the UAE for one standard unit of health gain, expressed in quality-adjusted life years (QALYs).
⇒ CET should be linked to the economic status of the country (gross domestic product per capita).
⇒ The threshold value will vary depending on the relative health gain of the health technology, the rarity of the disease and the severity of the disease.
⇒ Rare diseases will follow the European Medicines Agency and/or the Food and Drug Administration definition and will be differentiated from ultrarare diseases.
⇒ Ultrarare diseases will be considered on an individual patient level.
⇒ There will be no differentiation between the public and private sectors in terms of the threshold.

*Such recommendations reflect the collective consensus of the experts rather than individual opinions.

Box 2 Workshop findings*

⇒ A multiplier system, assigning each criterion (severity, rarity, quality-adjusted life year gained) a specific multiplier will be adopted to determine the cost-effectiveness threshold.
⇒ A cap on the collective multiplier for all criteria is recommended reflective to the maximum values seen internationally.
⇒ The incremental relative QALY gained method will be used to assess the relative health benefit.
⇒ Disease severity assessment will use one of the two methods: absolute shortfall or proportional shortfall.
⇒ Disease severity and relative health gain will be determined either on a categorical or a continuous scale.

*Such recommendations reflect the collective consensus of the experts rather than individual opinions.

To summarise the panel findings, a list of recommendations developed by the panellists is presented in box 1.

To translate the recommendations into a CET framework, further consultations with local experts through workshops were conducted. Based on such discussions, experts proposed a dynamic threshold system adaptable to various criteria through a multiplier mechanism, assigning each criterion (disease severity, disease rarity, a relative health gain) a specific multiplier based on its evaluation.

Within this context, a cap on the collective multiplier for all criteria was advised, anchored to the maximum values seen internationally. This limit aims to avoid the establishment of an excessively high CET unjustifiably inflated by the UAE's elevated GDP per capita.

For measuring the relative health benefits of health technologies, the IRQG method was chosen. This method quantifies the difference in QALY between the new and old health technologies in relation to the new technology. The IRQG calculation methodology is concisely outlined and described in the work by Kovács *et al*.[17]

To measure disease severity, the use of either AS or PS was recommended, in line with practices in some other countries.[2 20] Experts also deliberated on whether to employ categorical or continuous scale for determining IRQG outcomes and severity levels, aiming for a comprehensive approach to crafting the CET framework. Regarding the assessment of disease rarity, consensus among the expert panel was to adhere to the definitions provided by the EMA or the FDA to determine if a disease qualifies as rare. Summarising the preceding discussions, box 2 outlines the workshop findings reached by local experts in their discussions after the expert panel session.

Voting sessions

A collective total of 23 responses were gathered. The participants were of different areas of expertise and affiliations, including health economists, clinical pharmacists and consultant physicians. Table 1 presents the final survey questions and voting options with the number of participants voting for each option and their proportion. The proportion of participants was calculated using descriptive statistics in Microsoft Excel.

Based on the voting results, the recommended baseline threshold was 0.75 times the GDP per capita, which was the median value from the choices.

Regarding the maximum multiplier, the majority of the respondents (59%) recommended that a single criterion should have a maximum multiplier of 3 times the GDP per capita (3X) and the other two criteria should have a maximum multiplier of 2 times the GDP per capita (2X).

The next step was to decide which criterion would have the maximum of 3X the GDP per capita. Among the three options presented to participants—rarity, severity and relative health gain—the voting resulted in a narrow margin. Rarity emerged as the preferred choice to have the 3X of the GDP with 36% of the votes, while both severity and relative health gain each received 32% of the vote.

Regarding the method of measuring disease severity, the majority of the participants (77%) selected the PS method rather than the AS method. Further voting determined the approach to be used for calculating the multiplier for relative health gain and for measuring disease severity. The continuous approach was preferred over the categorical approach for both criteria. It was recommended by 77% of the respondents for calculating the relative health gain multiplier and 76% for the severity multiplier. Therefore, the final CET equation will be:

$$CET\ (local\ currency) = 0.75 \times Multiplier \times GDP/Capita$$

$$\text{Multiplier} = (Relative\ Shortfall + 1) \times (IRQG + 1) \times (is\_rare \times 2 + 1)$$

We provide a Microsoft Excel-based calculator for determining the CET value in online supplemental file 2, along with a hypothetical scenario that demonstrates the calculation process for each criterion leading to the final CET value in online supplemental file 1.

Table 1 Voting results†

Options	Votes	%
(1) What should be the baseline threshold compared with the GDP per capita?*		
0.25 GDP/capita	2	9
0.50 GDP/capita	6	26
0.75 GDP/capita	5	22
1.00 GDP/capita	10	43
(2) Out of multipliers (severity, rarity, relative health gain), how many should be equal with 3?		
0 (2×2×2)	4	18
1 (3×2×2)	13	59
2 (3×3×2)	5	23
(3) Which criteria would you like to have the 3X multiplier?		
Relative health gain (IRQG)	7	32
Severity	7	32
Rarity	8	36
(4) Which relative health gain (IRQG) multiplier method is best for the establishment of CET in the UAE?		
Categorical scale	5	23
Continuous scale	17	77
(5) Which severity approach is best for measuring disease severity in the UAE?		
Absolute shortfall	5	23
Proportional/Relative shortfall	17	77
(6) Which proportional or relative shortfall multiplier method is best for the establishment of CET in the UAE?		
Categorical scale	5	24
Continuous scale	16	76

*For the baseline threshold, median values were used.
† Bold values indicate the choices used in the final CET framework.
CET, cost-effectiveness threshold; GDP, gross domestic product; IRQG, incremental relative QALY gained; QALY, quality-adjusted life year; UAE, United Arab Emirates.

DISCUSSION

To guide decision-makers with evidence-informed recommendations for a health technology, it is crucial to apply HTA. A CET is the maximum monetary value set to adopt a health technology, serving as a key metric for assessing its value for money.[21] This study recommends a CET tailored to the UAE's unique economic and healthcare system, aiming to inform the reimbursement decisions for healthcare technologies in the country.

In our study, recommendations support a GDP-based CET as it reflects the economic status of the country, aligning with the international movement towards contextualising health economic models. Globally, there is a shift towards customising CETs to better reflect each country's economic status, healthcare priorities and societal values. Thokala *et al* suggest that a range from 1 to 3 times the GDP per capita is commonly employed as a benchmark for cost-effectiveness evaluations worldwide.[4] Furthermore, a previous literature review showed that 59% of the countries linked their CET to GDP per capita.[15] Another comprehensive review by Leech *et al* indicated that 66% of public research on cost-effectiveness analysis from 2000 to 2015 established a connection between CET and GDP per capita.[22]

Our results indicate that a CET set at 0.75 times the GDP per capita, complemented by multipliers that account for disease severity, rarity and health gain offers a pragmatic balance for the UAE. This simple approach is grounded in a societal perspective that values health benefits not merely as economic transactions but as reflections of societal priorities and ethical considerations.[16 23]

The decision to select a baseline threshold of 0.75 times the GDP per capita by experts, rather than 1 times, likely reflects the UAE's economic status with a significant and relatively stable GDP per capita. This baseline helps regulate the maximum thresholds, capping them at 9 times the GDP per capita, aligned with international norms. While a baseline of 1 times GDP per capita would still be acceptable, it would place the UAE among the highest globally, a position that may not be necessary for maintaining balance in reimbursement strategies.[14]

Moreover, the panel of experts recognised the importance of promoting equity in access to health technologies across both public and private sectors. To achieve this, the panel stated that CET should be uniform across all healthcare sectors. This uniformity aims to guarantee equal access to essential health technologies for all individuals, irrespective of their choice between public or private healthcare services. This decision was motivated by the overarching goal of maintaining a unified health economic policy and establishing a fair healthcare system that prioritises equal access to quality care for all individuals.

Additionally, regarding the method for measuring disease severity, the PS method was preferred over the AS. The PS evaluates disease severity by comparing the current health status of an individual or population with an ideal or desired health status, considering the proportional gap in health outcomes for a more relative assessment of disease severity.[23]

Our study also determined the optimal approach for calculating multipliers for relative health gain and disease severity, with a preference for a continuous method over a categorical one. While the categorical method categorises health gain or disease severity into distinct groups for a simpler analysis, the continuous method offers a more detailed measurement, capturing the variations in health outcomes or disease severity more accurately.[24] For identifying rare diseases, the expert panel agreed to adhere to the

definitions provided by regulatory authorities such as the EMA or the FDA.[25 26]

Different countries in the Middle East, including Egypt, and Saudi Arabia, have various methodologies for setting their CET reflective of each country's unique healthcare infrastructure and economic situation.[15 27]

The study conducted in Egypt shares a similar approach with our study by using the GDP per capita as a baseline to determine their CETs.[15] In the case of Egypt, a threshold between 1 and 3 times the GDP per capita is recommended, based on the IRQG approach.[15] On the other hand, the Saudi methodology calculates the marginal cost per unit of health produced by the healthcare system in a detailed manner.[27] The Saudi study provides estimates of Saudi riyal (SAR) 42 046 to SAR 215 120 per QALY gained, which represents 48%–246% of GDP per capita in Saudi Arabia.[27]

In line with our study, the consensus-based approach in Egypt considered various criteria such as disease rarity, and reimbursement type, providing a comprehensive framework for evaluating the cost-effectiveness of health technologies.[15] Specifically, for orphan medicines, they recommended a CET multiplier between 1.5 and 3.0, which also takes into consideration the rarity of the disease being treated. Moreover, they proposed a multiplier of 2 times for private reimbursement compared with the public reimbursement.[15]

Meanwhile, the Saudi approach primarily focused on the overall CET.[27] However, they also recognised the dynamic nature of the marginal cost per unit of health produced by the healthcare system and the multitude of factors that influence their used metric over time. This recognition suggests that unique circumstances, like rare or severe diseases, might necessitate different valuations.[27] The acknowledgement by Saudi Arabia underscores the understanding that CET should be a flexible, real-world economic measure that must evolve in response to changing healthcare dynamics and priorities.

Several countries outside the Middle East have also conducted studies to establish national CETs. For instance, Kovács *et al* sought to establish a new CET for Hungary by reviewing CETs from 26 European countries.[17] While Kovács *et al* used the IRQG to account for disease severity, our study primarily relied on the PS approach, similar to the method used in the Netherlands.[9]

The strategy adopted by the UAE for defining its CET is designed to represent the country's economic condition, healthcare priorities and societal values. This is achieved by linking CET to the GDP per capita and further enriching this basis with a tiered multiplier system that effectively integrates societal preferences into quantitative measures. This system assigns multipliers to specific criteria. The rarity criterion was assigned a maximum multiplier of 3X the GDP per capita, whereas the severity of a disease and the potential health gain from a technology both were allocated a maximum multiplier of 2X the GDP per capita. This approach supports the role of societal values in the policy-making process, ensuring that CET mirrors the healthcare priorities rather than being solely a theoretical economic construct.

The adoption of the CET framework in the UAE is anticipated to bring about significant improvements in resource allocation, decision-making, transparency, accountability, equitable access to healthcare and informed policy development. These outcomes would promote cost-effective healthcare and enhance the consistency of reimbursement decisions. This approach has been proven successful in the UK, where NICE employs CET to guide decisions on which treatments and technologies should be provided within the National Health Service .[14]

The next logical step would be conducting CEA of health technologies within the UAE healthcare system. Such a study could leverage CETs established in our research to evaluate the value of emerging health technologies in a real-world setting. For instance, Drummond *et al* performed detailed CEAs using established thresholds to inform healthcare decision-making.[28] A similar approach could be employed in the UAE to validate and refine CETs proposed in our study, ensuring their applicability and robustness in guiding healthcare resource allocation decisions.

Limitations

This study offers a thorough approach to defining CETs for the UAE, demonstrating a comprehensive understanding of the subject matter. However, it also recognises the presence of certain limitations and constraints that need to be considered. Primarily, employing GDP per capita as a foundational reference point for CET, a common practice, may not capture the full complexity of the economic landscape or the diverse health preferences within the population.

Moreover, an inherent fusion is noted between the severity of a disease and the incremental relative QALY gained. As diseases with greater severity naturally present broader scopes for relative QALY improvement, there is an augmented focus on the severity aspect. This was made clear to workshop participants, and despite this recognition, no adjustments were proposed.

The practicability of applying relative shortfall data from international sources also presents challenges, particularly when disease profiles exhibit substantial regional or national variations, such as in patient age or genetic typologies. Moreover, disparities in the standard of care can lead to divergent outcomes. Consequently, there is a strong recommendation to foster local research that will underpin more precise and informed decision-making processes.

Finally, our study's sample size was constrained by the limited number of participants who possessed

both the knowledge of HTA and active engagement as stakeholders.

CONCLUSION

This study presents a foundation for CETs in the UAE, highlighting the importance of generating local data and regularly reviewing CETs to adapt to the evolving landscape of healthcare and economics. Future research is expected to build on this groundwork, further refining CETs to align more closely with the healthcare goals of the UAE and to contribute meaningfully to the broader dialogue on health economics in the region.

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