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THE MEASUREMENT FUTURE IN HEALTH TECHNOLGY ASSESSMENT

LEGACY HTA: CAN ISPOR SURVIVE THREE DECADES OF PROMOTING MEASUREMENT INVERSION?

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LOGIT WORKING PAPER No 2007 SEPTEMBER 2026

www.maimonresearch.com

Tucson AZ

ABSTRACT

Background: *ISPOR has promoted and globalized the analytical framework of legacy health technology assessment (HTA) for approximately three decades. Yet the requirements of representational measurement that challenge this framework were established before ISPOR was founded in 1995. Measurement must precede arithmetic; the attribute must be identified; scale properties determine admissible operations; and multiplication and division require appropriate ratio properties and dimensional coherence. These requirements failed to become effective gatekeepers to legacy HTA.*

Objective: *To examine the implications for ISPOR, researchers, research centers, universities and students of recognizing measurement inversion and program-content inversion within the global legacy HTA knowledge base.*

Analysis: *ISPOR inherited health-state valuation, utilities, QALYs, cost-effectiveness analysis, preference measurement and decision modelling essentially intact and subsequently standardized, elaborated and globalized this framework. The result is an inverted knowledge architecture in which sophisticated downstream quantitative methods coexist with weak representation of the measurement requirements that should precede them. Reconstruction requires program-content inversion to be addressed first by acquiring the missing measurement knowledge, followed by application of the measurement gate. Therapy-impact claims then follow two pathways: linear ratio measurement for manifest attributes and Rasch measurement for latent attributes. This removes any scientific requirement to collapse heterogeneous therapy impacts into a universal preference-weighted outcome and renders conventional utility, QALY and cost-per-QALY constructs redundant unless their required measurement properties can be demonstrated. The challenge is therefore architectural rather than incremental.*

Implications: *ISPOR confronts an institutional problem created partly by its success in globalizing legacy HTA. Reconstruction potentially requires reconsideration of much of what it has taught, published and promoted. Researchers and research centers are more nimble: they can acquire the required measurement knowledge, restructure curricula and protocols, and transition independently to measurement-first therapy evaluation. Students can increasingly question whether programs teach the measurement foundations required for the quantitative methods presented.*

Conclusion: *ISPOR can undoubtedly survive organizationally; whether it can retain scientific authority while measurement and program-content inversion remain unresolved is a different question. Researchers, centers and universities need not await its response. Once the measurement challenge is recognized, it becomes a continuing Sword of Damocles over legacy teaching and research. The alternatives are straightforward: demonstrate that legacy methods satisfy the required measurement standards or reconstruct HTA around lawful measurement.*

INTRODUCTION

ISPOR has a problem, but it is not a new one. The scientific requirements that create the problem were already well established for quantitative evaluations when ISPOR was founded in 1995 [1 2 3]. Measurement was required to precede arithmetic; quantitative analysis required identification of the attribute to be measured; the properties of the measurement scale determined the arithmetic that could legitimately be performed; and multiplication and division required appropriate ratio properties and dimensional coherence. ISPOR did not overturn these requirements. More remarkably, they appear never to have become effective gatekeepers to the HTA framework that ISPOR subsequently promoted. Whether through lack of awareness, absence from the health-economics knowledge base it inherited, or failure to recognize their implications, ISPOR proceeded for three decades without requiring legacy HTA to satisfy them. The result is now visible at a global level: measurement inversion accompanied by program-content inversion, embedded within a professional knowledge architecture in which downstream quantitative methods are extensively developed while the measurement requirements that should precede them remain weakly represented or absent.

That history makes the present problem considerably more serious than the appearance of a new methodological criticism. ISPOR cannot reasonably characterize representational measurement as a recently proposed alternative to an established scientific framework. The standards against which legacy HTA is being assessed were available before ISPOR existed. The extraordinary question is therefore how an international scientific organization could spend three decades refining, standardizing, teaching and disseminating utilities, QALYs, cost-effectiveness analysis, preference measurement, decision modelling and associated Good Practices without first establishing the measurement properties required to give their defining quantitative operations empirical meaning. More remarkable is how this legacy HTA framework was accepted without questions by thousands of followers.

ISPOR did not originate the legacy framework. It inherited it essentially lock, stock and barrel: health-state valuation, utilities, QALYs, cost-effectiveness analysis, preference measurement, decision modelling and the associated assumption that these numerical constructs could be manipulated without first passing a measurement gate. What distinguishes ISPOR is what it subsequently did with that inheritance. Rather than subjecting its foundations to the requirements of representational measurement, ISPOR standardized, elaborated, promoted and globalized the framework. Through Good Practices, task forces, *Value in Health*, conferences, educational programs and an expanding structure of regional networks and consortia, it helped establish legacy HTA as a global professional knowledge base reproduced across research, teaching, consultancy, industry and agency practice [4 5 6 7].

The remarkable achievement was globalization; the remarkable failure was that the measurement foundations of what was being globalized were never made the gatekeeper to its quantitative claims. Measurement inversion was therefore not corrected as legacy HTA expanded internationally; it was reproduced with it. Program-content inversion followed the same trajectory. Downstream methods became increasingly sophisticated, standardized and widely taught, while attribute primacy, representational measurement, ratio measurement, admissible arithmetic, dimensional homogeneity and the distinct requirements of manifest and latent measurement

remained weakly represented or absent. What ISPOR globalized was therefore not merely a collection of methods. It was an inverted knowledge architecture. The greater its success in constructing that global knowledge base, the greater the institutional difficulty of reversing it.

This is why the question of survival arises. ISPOR will undoubtedly be capable of surviving as an organization. The more consequential question is whether it can retain its scientific authority while continuing to support a global HTA knowledge architecture characterized by measurement and program-content inversion. Acceptance of the measurement challenge potentially requires reconstruction of much of what ISPOR has spent three decades teaching, publishing and promoting; rejection requires a scientific demonstration that the challenge is wrong; ignoring it merely leaves the problem unresolved. ISPOR's predicament is therefore the paradoxical consequence of its own institutional success: it has built such an extensive global structure around legacy HTA that there may now be too much to reconsider for incremental reform to be credible. Whether ISPOR can survive scientifically depends upon whether it can confront that inheritance rather than continue to defend it.

THE CHALLENGE OF ISPOR'S PROBLEM

The problem confronting ISPOR arises from a reversal of the scientific sequence upon which quantitative claims should depend. Measurement must precede arithmetic. A quantitative analysis must begin with a defined attribute, establish the measurement properties of that attribute, determine the scale achieved and restrict subsequent arithmetic to operations admissible for that scale [8] . Dimensional homogeneity must be respected. These are not standards invented for HTA. Their intellectual foundations extend back centuries and they belong to the ordinary discipline of quantitative science.

Yet legacy HTA developed along a different path. The critical historical divergence was deceptively simple. Rather than beginning with the attributes through which therapies affect patients and asking how those attributes should be measured, health economics increasingly began with descriptions of health states and asked how those descriptions should be valued. Valuation effectively displaced measurement. Preference procedures generated numbers; those numbers became utilities; utilities were treated as proportional adjustments to time; QALYs followed; and incremental QALYs, cost-per-QALY analysis and reference-case modelling were constructed downstream. Arithmetic requirements came to determine the numerical constructs required by the framework rather than measurement determining what arithmetic was scientifically permissible.

ISPOR did not create this measurement inversion. It inherited an emerging framework in which it was already embedded. Its problem arises from what followed. Over approximately three decades, ISPOR became one of the most influential international promoters of that framework. Through Good Practices, publications, educational programs, conferences, task forces and regional networks and consortia, legacy HTA was refined, standardized and disseminated to an international professional community. Measurement inversion consequently became more than an error within a particular analytical methodology. It became embedded within a knowledge structure reproduced by academics, health economists, outcomes researchers, consultants, industry analysts, agency personnel, reviewers, teachers and successive generations of students.

The interrogation of the ISPOR knowledge environment makes the resulting problem unusually visible. Foundational propositions concerning attribute primacy, representational measurement, ratio measurement, admissible arithmetic and dimensional homogeneity receive little or no endorsement, while downstream methods including utilities, QALYs, economic evaluation, preference measurement, modelling and uncertainty analysis are strongly represented. Program-content assessments reveal the same pattern: extensive attention to contemporary HTA methods with little or no corresponding representation of the measurement requirements that should precede them. The knowledge architecture is highly developed downstream of a measurement gate that was never installed.

This means that program-content inversion must be addressed before measurement inversion can be fully confronted. A professional community cannot reasonably be expected to evaluate arguments concerning ratio measurement, admissible transformations, dimensional homogeneity or manifest and latent measurement pathways if those concepts were largely absent from the knowledge base through which its expertise was acquired.

The first challenge is therefore educational. It does not require ISPOR members, researchers or faculty to accept in advance that legacy HTA must be abandoned. It requires agreement that the measurement challenge warrants serious examination and that those judging it should possess the knowledge necessary to do so. That educational requirement extends far beyond ISPOR staff, officers and task forces. Three decades of international dissemination have created a much larger constituency whose professional expertise has been acquired within the legacy framework. Many of those individuals subsequently became its teachers, authors, reviewers, methodological experts and decision advisers.

There is nothing inherently extraordinary about asking an established scientific community to acquire knowledge absent from its original training. A biologist educated in the 1940s could have received an entirely respectable scientific education without the molecular understanding of heredity that followed elucidation of the structure of DNA. The double helix did not retrospectively invalidate that scientist's education. It changed what could reasonably be expected thereafter. Researchers had to acquire the new knowledge, examine its evidence and reconsider established explanations where the evidence required it.

The position in HTA is more demanding. The problem is not simply that established researchers must add a new body of knowledge to an otherwise scientifically ordered professional education. The required knowledge should have preceded much of that education in the first place. Training in legacy HTA typically begins downstream, with utilities, QALYs, preference measurement, cost-effectiveness analysis, modelling and uncertainty, where it should have begun with the attribute, representational measurement, scale properties, admissible transformations, ratio measurement and dimensional homogeneity. There is therefore no prior body of professional experience in legacy HTA that can qualify or substitute for the missing measurement foundation. The challenge is to establish a new knowledge base in which lawful measurement comes first and downstream methods are admitted only after passing the measurement gate. For established researchers this requires more than acquiring additional knowledge; it requires returning to the beginning, acquiring foundations that should have preceded their existing expertise, and then reassessing that expertise against them. Historical inheritance explains how the inversion occurred and why

generations of researchers reproduced it. Once the inversion has been exposed, however, inheritance cannot determine what should be taught, researched or applied next.

Once the missing measurement knowledge has been acquired, the second and more consequential challenge begins. Measurement becomes the gatekeeper to arithmetic. Every quantitative construct must identify the attribute represented, establish the appropriate measurement structure, demonstrate the properties of the resulting measure and restrict subsequent arithmetic to operations permitted by those properties.

At this point the two pathways for measurement of therapy impact become decisive. Manifest attributes such as survival duration, hospital days, ICU hours, treatment administrations and other directly observable quantities can support linear ratio measurement where the required empirical structure has been established. Latent attributes including pain, fatigue, physical function, treatment burden and need fulfilment require a fundamentally different pathway through Rasch measurement. Therapy evaluation therefore begins with the attribute and proceeds through the measurement pathway appropriate to it.

Recognition of these pathways fundamentally changes the architecture of HTA. There is no scientific requirement that survival, pain, fatigue, physical function and treatment burden be collapsed into a universal preference-weighted outcome. They are different attributes and remain different attributes after they have been lawfully measured. Preference weighting cannot manufacture commensurability between them.

This is why the measurement challenge cannot be accommodated by adding measurement as another topic to an established HTA curriculum. Conventional utility is neither a demonstrated linear ratio measure of a defined unidimensional attribute nor a Rasch measure of possession of a latent attribute. Rasch measurement does not rescue the QALY: a Rasch measure of pain remains a measure of pain, while the multiplicative interpretation derived from logit differences concerns ratios of odds, not a dimensionless linear proportion of attribute possession that can lawfully adjust time. Once the two measurement pathways are recognized, the presumed necessity for a universal preference-weighted outcome disappears and the conventional route from health-state description to utility, QALY and cost per QALY are redundant.

There is a limited sense in which ISPOR therefore faces a Wittenberg moment. A set of propositions has effectively been placed before an established intellectual order. But the analogy should end there. This need not become a contest between competing measurement faiths. Scales, axioms, admissible transformations and dimensional homogeneity are not articles of belief. Either the required measurement properties can be demonstrated or they cannot. Those wishing to retain legacy HTA can identify where the measurement critique fails and provide the required measurement demonstration. Institutional authority, professional consensus, publication history and decades of application cannot substitute for that demonstration.

Nor is the challenge adequately represented by an Augean-stables metaphor. Diverting streams through legacy HTA to flush away accumulated methodological problems would leave intact the structure that generated them. The stables themselves require demolition and rebuilding. Improved

utility instruments, revised Good Practices, more sophisticated models and better uncertainty analysis cannot repair a framework while its scientific sequence remains inverted.

This is what makes the institutional problem confronting ISPOR so formidable. What has been peripheral would have to become foundational; what has been routinely accepted would become subject to proof. Program content would first have to equip the professional community with knowledge that was largely absent from its original training. That community would then have to apply its newly acquired knowledge to the methods upon which much of its existing expertise has been built. Some methods may survive the measurement gate. Others may not.

The undertaking is therefore monumental, but the scientific requirements are remarkably uncomplicated: define the attribute; establish its measurement structure; demonstrate the scale properties; distinguish the manifest and latent pathways; respect dimensional homogeneity; and perform only admissible arithmetic. The institutional transition may be Herculean. The measurement test is not. It is merely a return to the standards of normal science.

That is the challenge of ISPOR's problem. It is not being asked merely to revise methodological guidance. It confronts the possibility that the organizing sequence of its quantitative knowledge architecture has been reversed for three decades. Correcting that inversion requires more than renovation. It requires reconstruction.

THE CASE FOR RESEARCHERS AND RESEARCH CENTERS

The scale of the problem confronting ISPOR does not imply that the transition to lawful measurement must await an institutional response from ISPOR. The opposite conclusion may be more appropriate. Individual researchers, university departments and research centers are not burdened by the same organizational history and can begin reconsidering the foundations of quantitative HTA independently. Representational measurement does not require endorsement by a professional society before its requirements apply.

This distinction is important because ISPOR faces an unusually difficult institutional transition. Acceptance of measurement inversion would require reconsideration of substantial elements of the framework it has promoted internationally for three decades. Researchers and research centers face a different problem. They may have been educated within that framework, taught it, published within it and applied its methods, but they are not required to defend its continued existence merely because it constitutes part of their intellectual inheritance. Historical participation in legacy HTA is not a scientific argument for its preservation.

The first requirement is therefore straightforward: acquire the measurement knowledge necessary to evaluate the challenge. This should not begin with a demand that researchers accept the abandonment of utilities, QALYs or cost-per-QALY analysis. It should begin with agreement that quantitative claims must satisfy the requirements of measurement and that researchers evaluating the challenge should understand those requirements. Attribute definition, unidimensionality, scales of measurement, axiomatic foundations, admissible transformations, ratio measurement, dimensional homogeneity and admissible arithmetic provide the appropriate starting point.

The two measurement pathways then provide the alternative structure for therapy-impact research. Manifest attributes require appropriate linear ratio measurement. Latent attributes require Rasch measurement. Researchers can therefore begin with the attributes through which therapies actually affect patients rather than with the requirement to populate a predetermined economic model. Survival, hospital days, treatment duration, pain, fatigue, physical function and need fulfilment become separate objects of measurement and empirical investigation. There is no requirement that they first be transformed into a universal preference-weighted currency.

This creates a particularly important opportunity for research centers. Their role need not be confined to criticizing legacy HTA. They can become laboratories for reconstruction. Existing research programs can be examined to determine whether their quantitative claims identify defined attributes and employ appropriate measurement structures. Graduate curricula can introduce measurement before economic evaluation. Therapy-impact protocols can specify the attribute, measurement pathway, comparator, population and timeframe before analysis begins. Latent-attribute research can move from score construction toward Rasch measurement and possession claims. Manifest outcomes can be examined explicitly for the requirements of linear ratio measurement. Claims can be designed from the outset to permit empirical evaluation, replication and falsification.

Nothing in this transition requires researchers to suspend scientific disagreement. Those who believe that conventional utility, the QALY or the cost-per-QALY reference case can satisfy the measurement challenge should attempt to demonstrate that they can. Indeed, research centers provide an appropriate environment in which competing claims can be subjected to formal examination. The relevant question is not whether a method has been accepted by ISPOR, an HTA agency or the health-economics literature. It is whether its claimed quantitative interpretation survives the required measurement tests.

Universities carry an additional responsibility because they transmit methodological knowledge to the next generation. Faculty may reasonably explain that representational measurement was not part of their own training and that they taught the methods regarded as authoritative within their discipline. That explains the inheritance. It cannot justify indefinite reproduction once the measurement challenge has been made explicit. Students should at minimum be informed that the scientific foundations of legacy HTA have been challenged and be given sufficient measurement knowledge to evaluate the arguments themselves.

This is where researchers and research centers may have an advantage over ISPOR. They do not need to reconstruct a global professional organization before acting. A research group can begin with one seminar, one graduate course, one measurement-based research protocol or one therapy-impact study. A center can review its existing research portfolio against the measurement gate. Faculty can acquire the missing knowledge and progressively restructure teaching. The transition can therefore be decentralized and cumulative.

Nor need researchers wait for a universally agreed replacement reference case. Measurement-first HTA does not require another universal analytical template to replace the QALY framework. Its organizing principle is precisely the reverse. Begin with the therapy-relevant attribute, determine whether it is manifest or latent, establish the appropriate measurement structure and construct the

quantitative claim permitted by that measure. Different research questions will consequently generate different attribute-specific claims.

The institutional inertia facing ISPOR therefore need not become the inertia of the wider research community. Indeed, independent movement by universities and research centers may eventually create pressure in the opposite direction. As researchers acquire the missing measurement knowledge and begin applying the measurement gate, professional organizations, journals and HTA agencies will increasingly be required to explain why legacy constructs should remain exempt from requirements being applied elsewhere.

The choice for researchers and research centers is consequently less formidable than that facing ISPOR. They are not being asked to repudiate three decades of institutional policy. They are being asked to examine whether the methods they inherited satisfy the standards of quantitative science and, where they do not, to stop reproducing them. The scientific safe harbor is already available: acquire the missing measurement knowledge, apply the measurement gate, retain what survives and abandon what does not.

Researchers do not need ISPOR's permission to make that transition. Nor do they need to wait for ISPOR to make it first.

STUDENT EXPECTATIONS

There is a further constituency that cannot be ignored: students. The measurement cat is now out of the bag. Arguments concerning measurement inversion, the absence of ratio measurement, the measurement status of utilities and QALYs, dimensional homogeneity, and the distinction between manifest and latent measurement pathways are publicly accessible. Students encountering these arguments through published papers, professional discussion and Internet searches may reasonably ask why issues presented as foundational to quantitative science are absent from, or only marginally represented in, their HTA education.

Their questions need not begin with acceptance of the critique. They can be much simpler. Does the program teach representational measurement? Are students introduced to nominal, ordinal, interval and ratio scales and the arithmetic permitted by each? Is ratio measurement addressed before methods requiring multiplication and division are introduced? Is dimensional homogeneity discussed? Are manifest and latent attributes distinguished? Are students taught the different measurement pathways required for each? What measurement properties are claimed for health-state utilities, and how are those properties demonstrated before utilities are used to construct QALYs?

These are legitimate educational questions. A student does not need expertise in measurement theory to ask whether the scientific foundations required for the methods being taught form part of the curriculum.

The implications for faculty are significant. Until recently, an instructor could reasonably teach the established HTA framework on the basis that it represented accepted disciplinary practice. That position becomes more difficult once students can readily discover a substantial challenge to its

measurement foundations. The issue is no longer whether every faculty member agrees with that challenge. Academic disagreement is entirely legitimate. The issue is whether students should be taught the legacy framework without being informed that its scientific foundations have been challenged and without being given sufficient knowledge to understand the nature of that challenge.

Students should therefore be encouraged to inquire about what their programs cover. They might reasonably ask prospective programs whether representational measurement forms part of the curriculum before enrolling. Existing students might ask where measurement, ratio scales, admissible arithmetic and the measurement of latent attributes appear within their courses. Doctoral students selecting dissertation topics might ask whether proposed quantitative claims satisfy the measurement requirements appropriate to the attributes they intend to investigate.

This creates a new form of accountability. Curriculum content is no longer exclusively a matter between professional organizations and faculty. Students can compare what they are being taught with challenges now available in the public domain. A program that continues to emphasize utilities, QALYs, cost-effectiveness modelling and preference measurement while providing no corresponding foundation in representational measurement may increasingly be asked to explain that asymmetry.

Faculty remain free to defend legacy HTA. But students are equally entitled to ask for that defense. If a program teaches that a utility can proportionally adjust time, students may ask what measurement properties authorize that operation. If QALYs are treated as quantitative outcomes, they may ask what scale of measurement has been established. If latent therapy impacts are assessed through questionnaire scores, they may ask how possession of the latent attribute has been measured.

The significance of these questions extends beyond individual classrooms. Once students begin asking them, program-content inversion becomes visible from below as well as from above. Universities and professional organizations may choose how quickly they respond to the measurement challenge. They cannot reasonably expect future generations of students to remain unaware that the challenge exists.

TRANSITION TO MEASUREMENT IN HEALTH TECHNOLOGY ASSESSMENT

The transition to lawful measurement requires more than demonstrating the measurement failures of contemporary HTA. It requires a replacement framework grounded in representational measurement. The Maimon Research nine-unit transformation program provides that framework [9]. Beginning with the principle that measurement must precede arithmetic, the program progresses through the definition of attributes, scales of measurement, admissible arithmetic, dimensional homogeneity, manifest and latent attributes, linear ratio measurement, Rasch measurement, attribute possession, and the construction of empirically evaluable therapy-impact claims. The purpose is not to add measurement to the existing HTA paradigm while leaving its analytical structure intact. It is to replace that structure with one in which quantitative claims must first satisfy the requirements of lawful measurement and can then be evaluated, falsified and replicated.

At the same time, the nine units provide the substantive foundation for a graduate course in lawful measurement for HTA. Comprising approximately 45,000 words of structured instructional material, the program provides sufficient depth to move beyond a brief introduction to measurement theory and support a systematic transition from the legacy HTA framework to one grounded in representational measurement. Its sequence can be translated directly into a graduate curriculum in which measurement provides the organizing scientific foundation rather than appearing as an additional methodological topic downstream of economic evaluation. Faculty are therefore provided not simply with a critique of existing methods, but with the substantive material and sequence required to construct an alternative course.

As far as can presently be ascertained, no comparable program has been identified internationally that is designed specifically to support the transition from legacy HTA to an HTA grounded in the requirements of lawful measurement. That distinction is important. The program is not intended to add a measurement component to contemporary HTA while leaving utilities, QALYs and reference-case modelling undisturbed. It provides a structured pathway for reconsidering the scientific foundations of the discipline itself and for rebuilding quantitative therapy evaluation around measurement before arithmetic, ratio measurement and claims capable of empirical evaluation, replication and falsification.

The resulting course would replace the conventional emphasis on utilities, mapping, QALYs and reference-case modelling with an alternative scientific structure: defining the target attribute, determining whether it is manifest or latent, constructing the appropriate linear ratio or Rasch measure, and using that measure to formulate empirically evaluable therapy-impact claims. The nine-unit program therefore provides not simply an argument for abandoning the legacy framework, but the content and organizing structure from which its educational replacement can be built. The transition is consequently from one knowledge architecture to another: from arithmetic preceding measurement to measurement determining what quantitative claims and arithmetic are scientifically permissible.

Faculty and practitioners who enroll will have continuous access to question-and-answer support throughout the program, providing assistance as they work through the implications of representational measurement for teaching, research and HTA practice. This becomes particularly important where faculty are using the program as the foundation for curriculum development. Questions concerning course structure, individual topics, measurement concepts, examples, assignments and their application to existing HTA material can be addressed as they arise. Participants are therefore not expected to complete the nine units and then independently determine how an unfamiliar scientific framework should be translated into teaching or practice. Continuing support makes the movement from understanding to implementation an integral part of the transition.

Additional faculty and institutional support can also be arranged on an agreed basis. This may include Zoom seminars and workshops, assistance with graduate-course and curriculum redesign, development of teaching materials, recommended references and readings, and guest lectures addressing particular aspects of representational measurement and its application to HTA. Support can be tailored to individual faculty members, courses, departments, research centers or professional groups.

The nine-unit program should therefore be understood as the starting point for a managed transition to lawful measurement. It provides the replacement scientific framework, the substantive elements required to construct a graduate course around that framework, and continuing access to the expertise and educational resources required for implementation. The objective is not simply to demonstrate why contemporary HTA must change, but to provide faculty and practitioners with the foundations and practical means to build, teach and apply its replacement. Once the measurement failure of legacy HTA is recognized, there is no scientifically defensible route back.

CONCLUSION: ENSURING A FUTURE FOR HEALTH TECHNOLOGY ASSESSMENT

There need be no losers from the abandonment of legacy HTA. The immediate beneficiaries are researchers, research centers, universities and students prepared to move quickly. They do not carry the institutional burden confronting ISPOR. A research center does not have to rewrite three decades of Good Practices, reconsider an international educational infrastructure, reconstruct a journal tradition, redirect task forces and regional networks, or explain why methods it helped establish as professional standards must now be subjected to measurement requirements that were in place when those standards were created.

This makes scientific agility an extraordinary advantage. A research group can acquire the missing measurement knowledge, apply the measurement gate to its existing work and begin reconstructing its research program almost immediately. A university can introduce representational measurement into graduate education. A center can distinguish manifest from latent therapy-impact attributes, adopt linear ratio and Rasch measurement where appropriate, redesign protocols around attribute-specific claims and require empirical evaluation, replication and falsification. None needs to wait for an international professional organization to authorize the transition.

This is where the contrast with ISPOR becomes decisive. ISPOR is constrained by the organization it has successfully built. Its international authority rests in substantial part upon the knowledge architecture it has spent three decades refining, promoting and disseminating. Utilities, QALYs, cost-effectiveness analysis, preference measurement, modelling, Good Practices and related methods are not peripheral activities that can simply be removed. They are deeply embedded within its educational, publication and professional identity. The greater ISPOR's historical success in institutionalizing legacy HTA, the greater the difficulty of reversing course.

The paradox is striking. The smaller and more intellectually nimble actors may be best positioned to lead the transformation precisely because they have less to dismantle. A university research center can change a curriculum. A research group can change a protocol. An individual investigator can change the questions being asked. A doctoral student can begin with an attribute rather than a utility. Changes of this kind can occur rapidly and independently, creating a decentralized transition that does not depend upon a Damascene conversion by ISPOR.

ISPOR, by contrast, confronts an institutional prison of its own construction. Acceptance of the measurement challenge potentially requires it to question much, if not most, of what it has taught, published, endorsed and disseminated for incremental reform to provide an adequate response. Its

difficulty is not that reconstruction is scientifically obscure. It is that there is so much accumulated intellectual structure to reconsider.

There is, however, a less comfortable consequence for those who choose not to accommodate the measurement challenge. Once the problem has been understood, it cannot easily be made invisible again. It becomes a continuing cloud over the teaching and application of legacy HTA. A faculty member may continue to teach utilities, QALYs, cost-per-QALY analysis and reference-case modelling because these remain established professional methods. A researcher may continue to publish models constructed within the same framework. But an unresolved question remains in the background: do the quantities being manipulated possess the measurement properties required for the arithmetic being performed?

Before the measurement challenge was exposed, absence of this question from conventional HTA training could explain its absence from teaching and research. That position becomes progressively less defensible once the challenge is known. A researcher who has examined the arguments cannot simply return to the assumption that widespread acceptance establishes scientific legitimacy. Either the measurement critique must be answered or the possibility remains that methods being taught and applied lack the measurement foundations claimed for them.

This creates an important asymmetry between accommodation and refusal. Those who engage with the challenge can resolve the uncertainty. They can acquire the required measurement knowledge, apply the measurement gate and determine what survives. They may even conclude that particular legacy methods are defensible, provided the required measurement demonstration can be supplied. Those who refuse to engage acquire no comparable resolution. The unanswered challenge remains.

For faculty the problem is particularly acute. It is one thing to say, “I teach legacy HTA because this is the established framework and I have not encountered a substantive reason to question it.” It is quite another to continue teaching exactly the same framework while knowing that its measurement foundations have been explicitly challenged and without either answering that challenge or informing students that it exists. At that point the issue moves beyond methodological preference to the responsibilities associated with graduate education.

Students intensify this pressure because the measurement critique is now publicly accessible. They can ask what attribute a utility actually measures, what scale has been demonstrated, why discounting of time is admissible, where dimensional homogeneity enters the analysis, and why representational measurement was not taught before QALYs and cost-effectiveness modelling. These questions cannot be answered by saying that the methods are standard practice. Standard practice is precisely what is being challenged.

The cloud of failure is therefore not criticism from Maimon Research or any other external source. It is the unresolved scientific question itself. Once recognized, it accompanies every subsequent lecture, model, publication and recommendation constructed within the legacy HTA framework. The only durable way to remove it is to confront the measurement challenge: demonstrate that the existing methods satisfy the required standards, or reconstruct the analysis where they do not.

The future of HTA therefore need not be determined by whether ISPOR can escape the architecture it has spent three decades constructing. The transition can begin elsewhere, and it can begin now. ISPOR's organizational weight may make abandonment exceptionally difficult for ISPOR. It need not make abandonment difficult for everyone else.

ACKNOWLEDGEMENT

I acknowledge that I have used OpenAI technologies, including the large language model, to assist in the development of this work. All final decisions, interpretations, and responsibilities for the content rest solely with me.

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