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CONSIDERING EQUITY IN HEALTH TECHNOLOGY ASSESSMENT: AN EXPLORATORY ANALYSIS OF AGENCY PRACTICES

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Objectives: Equity is one of the founding principles in most healthcare systems. Financial constraints entail an increased risk of exacerbating inequities and a greater need for evidence-based decisions. It is, therefore, both important and timely to enquire how equity can be addressed in health technology assessment (HTA) practice. We aimed to explore related practices from a broad range of HTA agencies, identify exemplary approaches and common concerns, and offer insights for future considerations.
Methods: HTA agencies for which both methodological guides and HTA reports were publicly available were selected from an initial comprehensive pool. Information was extracted on issues ranging from a general commitment to fairness to specific measures targeting both methodological and process-related elements.
Results: Methodological documents and ninety-eight reports from nineteen agencies were analyzed. Our findings indicate that equity was not a standard consideration in HTA report production. The nature of specific approaches and the amount of resources invested into including an equity perspective varied considerably. Specific measures (e.g., appropriate information sources, analytical tools, and schemes) were mentioned by almost half of the agencies analyzed. Albeit sporadic, both horizontal and vertical equity considerations were identified in included HTA reports.
Conclusions: While varying legal contexts and institutional principles can lead to different interpretations of equity at the decision point, a combination of methodological and process-related practices could contribute to more equity-sensitive evaluations, especially in conjunction with enhanced dissemination of existing methodological tools. Networking initiatives on behalf of existing collaborating platforms could play an important role in this direction.

Keywords: Equity, Health technology assessment, Inequities, Agency approaches

Recent economic developments at the global level have led to both an increased focus on evidence-based approaches for rational policy making in health care and exacerbated inequities across social determinants of health. While a given health policy, health program, or coverage decision may have no direct impact on inequities, it may also reduce or intensify them. Health technology assessment (HTA) was conceived as a tool to guide decision makers in efficiently allocating limited resources within the health system and enabling timely access to appropriate technologies based on scientific knowledge. It is one of the main evidence-based tools informing coverage decisions in many countries. Furthermore, it was endorsed by the World Health Organization (WHO) in May 2014 as a vital component of decision making for countries aiming to achieve universal coverage in an equitable way (1). It is, therefore, important to consider whether HTA practice is concerned with equity questions and how such concerns could be incorporated in the development of assessments in a realistic way.

The literature on equality and equity in health and health care is vast and multifaceted. In her defining work for WHO, Whitehead (2) states that the term inequity goes beyond measurable differences in health status to include a moral and ethical dimension; inequities are differences that are unnecessary and avoidable but are also considered unfair and unjust in the given context. Equity is "therefore concerned with creating equal opportunities for health and with bringing health differentials down to the lowest level possible" (2). The WHO's Commission on Social Determinants of Health (CSDH) further specified that systematic differences in health considered to be avoidable by reasonable action are unfair and thus inequitable (3).

Evans and Brown (4) first proposed the operationalization of determinants across which such differences can exist with the PROGRESS acronym, later to be extended to PROGRESS-Plus

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(Place of residence, Race/ethnicity, Occupation, Gender, Religion, Education, Socioeconomic status, Social capital; "Plus" includes additional elements that influence health equity such as age, sexual orientation, disability and other vulnerabilities) (5). The "community effectiveness" of a given technology, namely its impact when applied in a "real world" setting compared with the experimental environment of a clinical trial, may vary for different population groups as it takes into account contextual factors (6). Thus, to assess the real world consequences of adopting a given health technology, contextual elements need to be considered and the corresponding evidence sources and types included in evaluations (7–10).

The HTA Glossary (HTAglossary.net) defines equity as "the fair allocation of resources or treatments among different individuals or groups, such that they each get what they are owed or what they are entitled to. (. . .) Vertical equity means that the people in the greatest need of services receive the most services, and horizontal equity means that people who have similar needs receive similar services." In the context of HTA for resource allocation, there has been ample discussion on equity concerns at the decision point, both at the theoretical level, for example, on value judgments and the underlying theories of distributive justice, and from a methodological perspective. Williams and Cookson's (11) estimate in 2006 was that the majority of HTA programs did not have a systematized approach toward balancing equity concerns with efficiency considerations when determining value. Culyer and Bombard (12) note that to date, equity discourse among HTA agencies takes the form of either a general awareness and recognition of relevant issues, such as the differentiation between horizontal and vertical equity, or more concrete individual approaches, such as the application of equity weights in the evaluation of benefits and costs.

When it comes to evidence assessment, best practice approaches have long recognized the importance of considering sociocultural elements along with clinical effectiveness, safety, and costs. However, these elements have not been sufficiently incorporated in practice, mainly due to restrictions in time and other resources (13). Several important initiatives emerged in recent years, going beyond the general consideration of sociocultural elements to explicitly address equity issues related to HTA. The WHO Collaborating Centre for Knowledge Translation and Health Technology Assessment in Health Equity put together the first "equity-oriented toolkit" for HTA (14), while Culyer and Bombard developed a framework on equity-related issues to be considered by decision makers across the spectrum of HTA report production (12). Furthermore, extensive methodological work on incorporating equity considerations exists for individual HTA domains, such as on systematic reviews of effectiveness (10;15;16) or economic evaluation (17–19).

Perhaps most notable in this respect is the work of the Campbell and Cochrane Equity Methods Group. The Group responded to the CSDH endorsement of systematic reviews as one of the tools that could be used to guide political action on equity (20) by launching a comprehensive research effort to optimize existing methods. It evaluated the incorporation of equity concerns in existing reviews and found that their consideration was sporadic, variable, and inadequate (21;22). Subsequently, they produced concrete signposts for equity-sensitive reviews, including an equity extension for the PRISMA reporting tool (15;16;23).

While equity is an important criterion from the decision-makers' point of view (24), evidence used to inform policy does not always take relevant considerations into account (19;21;25;26). Very little information exists on institutional practices toward equity-related issues in HTA report production (25;27;28). Our research aimed to systematically explore whether and how HTA agencies include equity considerations in their assessments; furthermore, to map approaches, both methodological and process related, that could accommodate equity-sensitive reports even if they are not initially adopted for that purpose; lastly, to illustrate exemplary practices in combination with methodological literature that could aid those interested in including equity elements in their work. We were not concerned with the equity discussion on theories of distributive justice adopted by individual agencies, as reflected, for example, in the setting of cost-effectiveness thresholds or the rationale behind equity weights, as these are bound to be both institution- and context specific (12).

METHODS

Composition of the Agency Pool

We used a systematic, iterative approach to identify international agencies involved in HTA production. Aiming for a broad, comprehensive sample we combined the membership lists of the International Network of Agencies for Health Technology Assessment (INAHTA), the European Network for Health Technology Assessment (EUnetHTA) and nonprofit members of Health Technology Assessment International (HTAi) with agencies included in comparative analyses published in the International Journal of Technology Assessment in Health Care in 2009 and 2010.

Only agencies actively involved in HTA production (by commissioning or conducting assessments), for which both a methodological guide and at least one HTA report were publicly available, were considered for the analysis. To obtain this information, we searched all agency Web sites in January and February 2011. We subsequently contacted agencies by email to verify the validity of retrieved information and documents, unless (a) it was clear from their Web site that they were not actively involved in HTA or (b) online information available in the working languages (English, French, or German) was insufficient.

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Document Selection

Documents were included as methodological guides if they had been developed by the respective agency and described the methodological approach on which assessments were to be based. Documents had to cover at least the assessment of effectiveness for drugs, nondrug or population-based interventions. Thus, documents only covering cost-effectiveness or not describing evidence procurement were excluded. Where more methodological documents with different scopes were available from each agency (e.g., guide for assessment and template for manufacturer submissions), these were included if corresponding, publicly available HTA reports were also included. The most recent version available at the time of document selection was included for agencies where consecutive iterations of the same guide existed.

Full HTA reports from included agencies were considered for analysis if they assessed a therapeutic (drug or nondrug) or population-based intervention in a systematic way, that is by (a) including a search for evidence in at least two sources and (b) considering primary research and not exclusively synthetized evidence. Aiming to capture practices as current as possible at the time of selection, the three most recent reports for each category were identified and no reports published before January 2006 were included. Reports commissioned by other agencies included in the sample as well as draft versions were excluded. To facilitate a simpler analysis, where more than one type of report was available (e.g., single and multiple appraisals by the National Institute for Health and Care Excellence), we restricted our sample to one type of document.

Information Extraction and Analysis

We aimed to explore two main questions, namely (a) the extent to which equity considerations are an issue for agencies actively involved in HTA production and (b) what methodological and process-related approaches are in place that could facilitate equity-sensitive approaches. We developed separate extraction tools for methodological papers and HTA reports, tailored to capture this information (Supplementary Table 1).

We extracted information explicitly on equity and on approaches or processes that can potentially enable the exploration of differences across population groups, such as subgroup analyses or stakeholder involvement, even if they were not used by the agency for equity purposes. While the focus was on assessment, equity-related issues with regard to appraisal were also taken into account if they were raised in the included documents (where applicable). As per the research scope, we did not analyze model assumptions included in economic evaluations; we did extract equity considerations if they were explicitly discussed.

The extraction tools were formulated broadly to allow for different types and formulations of equity-related elements. This approach was adopted based on previous research (27), which suggested that such elements would range from axiomatic statements on commitment to fairness to specific methods for research or analysis, occasionally falling under the heading of psychosocial/sociocultural considerations. Methodological literature on equity considerations in evidence syntheses that was available in early 2011 (9;10;14;15) also informed the development of the extraction tools. Finally, stakeholder involvement, to the extent it was described in included documents, was also explored. This was based on the assumption that fairness of procedures is important in the context of HTA (12). Furthermore, deliberative processes can provide input on the relevance of research questions as well as on contextual factors to be considered during the assessment—both issues that are difficult to examine by means of evidence types usually included in assessments (29–32).

The extraction tools were piloted and subsequently optimized; information was extracted by one author (D.P.) and checked by a second (J.K.); discrepancies were solved by consensus. Results from methodological guides are presented in a narrative synthesis, and descriptive statistics are provided for HTA reports where appropriate (absolute numbers are given for groupings of ten reports or less, percentages are provided for higher numbers).

RESULTS

Included Agencies

Of 121 agencies identified, both methodological papers and HTA reports in the working languages were available for nineteen (Supplementary Figure 1). The nineteen agencies included in the analysis were diverse in terms of remit (some only evaluated pharmaceuticals or procedures while others covered a broad range of technologies) and role in their health system (Table 1). Due to the study's technical limitations in terms of access to information and language, some countries were not represented in the sample and others were present more than once.

Equity Considerations in Methodological Guides

As a natural consequence of the variability of agencies included in the sample, methodological guides included general educational handbooks (e.g., DACEHTA), agency methods for assessment only (e.g., AHRQ, DIMDI), agency methods for assessment and appraisal (e.g., G-BA, TLV) and specific templates outlining requirements for submissions by the industry (e.g., DERP) (Table 1). Furthermore, documents varied in terms of length and age at the time of analysis; while some agencies indicated having newer, internal manuals available at the time in their responses, our research only included the latest publicly available documents in the analysis. A full list of included methodological guides can be found in Supplementary Table 2.

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Table 1. Agencies Included in the Analysis, Type of Methodological Guide and Number of Included Reports

Agency	Country	Type of methodological guide	No. of included reports		
			Drug	Nondrug	Population-based intervention
Agency for Healthcare Research and Quality (AHRQ)	US	2 (2011)	3	3	0
Australian Safety and Efficacy Register of New Interventional Procedures - Surgical (ASERNIP-S)	AU	3 (2003) 1 (2008)	0	3	0
Canadian Agency for Drugs and Technologies in Health (CADTH)	CA	2 (2003 & 2011)	3	3	3
Center for Reviews and Dissemination (CRD)	UK	1 (2009)	3	3	3
Danish Centre for Health Technology Assessment (DACEHTA)	DK	1 (2007)	1	0	0
Drug Effectiveness Review Project (DERP)	US	2 (2010) 4 (2010)	3	0	0
German Institute for Medical Documentation and Information (DIMDI)	DE	2 (2008)	3	3	3
Federal Joint Committee (G-BA)	DE	3 (2011) [a]	3	3	3
Gesundheit Österreich (GÖG)	AT	2 (2010)	0	1	2
Haute Authorité de Santé (HAS)	FR	2 (2000)	0	3	3
Health Intervention and Technology Assessment Program (HITAP)	TL	1 (2009)	0	0	1
Federal Association of Health Insurers (HVB)	AT	2 (2008)	1	3	1
Institute for Quality and Efficiency in Health Care (IQWiG)	DE	2 (2011)	3	3	3
Belgian Health Care Knowledge Centre (KCE)	BE	2 (2007)	1	3	3
Ludwig-Boltzmann Institute (LBI)	AT	2 (2008)	2	3	1
Medical Services Advisory Committee (MSAC)	AU	3/4 (2005)[b]	0	3	0
National Institute for Health and Clinical Excellence (NICE)	UK	3 (2004, 2008, 2009)	3	3	0
Pharmaceutical Management Agency (PHARMAC)	NZ	4 (2010)	1	0	0
Dental and Pharmaceutical Benefits Agency (TLV)	SE	3 (2008)	3	0	0
		Subtotals	33	40	26
		Total		98[c]	

Note. 1, general methods; 2, agency methods for assessment only; 3, agency methods for assessment and appraisal; 4, guide for submission by the industry.
[a] Document has legal function.
[b] Appraisal process is described only for the "interim funding" approach, which falls under the "coverage with evidence development" scope.
[c] One report addressed both a drug and a non-drug intervention and is counted twice in the subtotals.

Approximately half of the methodological documents included some interpretation of equity among the goals of the respective health technology assessment program or the document itself. In this context, this took the form of "fairness" (AHRQ), "social justice" (KCE), the "appropriate consideration of the interests of those afflicted, taking into account age, biological and social gender and particularities related to life circumstances" (G-BA) or "equity" verbatim (CRD, MSAC, NICE). These formulations were related to the agency's remit and the type of document examined. For example, the G-BA is responsible for decision making on health technologies in the German statutory health insurance system and its methods are described in its code of procedure ("Verfahrensordnung"). It was, therefore, not surprising that the latter included a consideration of different population characteristics to be taken into account. On the other hand, methodological guides purely focusing on assessment elements (e.g., HVB, DIMDI) did not necessarily require the description of system-level goals.

Methodological Elements. As a general approach potentially related to equity concerns, the consideration of (psycho)social issues related to the adoption of the technology in question was mentioned by several agencies (CADTH, DIMDI, GÖG, KCE, NICE). CADTH mentioned such elements under the concept of "intangible" factors that need to be accounted for and can include "patient satisfaction, individual acceptance of screening/treatment, stigmatization/anxiety and gender/family concerns" and distinguished them from issues that need to be considered under "equity-efficiency trade-offs," which were mentioned in a separate subsection. According to the KCE, patient preferences were to be examined in the societal context, especially in case of social justice concerns.

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Determinants in the PROGRESS-Plus acronym were explicitly mentioned in three ways across the included methodological guides: (a) to consider in terms of relevance of different subgroups when formulating the research questions (AHRQ, DERP, G-BA), (b) in terms of looking for or conducting subgroup analyses in included studies on effectiveness (AHRQ, CADTH, DERP), and (c) recognizing groups to examine more closely in the context of inequalities (CADTH, CRD, GÖG, IQWiG, NICE).

Table 2 shows specific approaches adopted by individual agencies that were related either to general equity considerations or the examination of effects on population subgroups. These range from the appropriate sources for evidence on psychosocial implications (DIMDI) to individual tools such as health services impact (CADTH) and the NICE Equality Scheme.

Process-Related Elements. Information on practices related to procedural equity, such as the participation of stakeholders, was extracted where available. However, the depiction of such issues was highly dependent on the nature of the methodological guide under consideration. Thus, the compiled overview of related processes is potentially incomplete both for individual agencies and the overall sample.

Examples of approaches described in the documents included the involvement of stakeholders in topic selection (AHRQ); opening the assessment protocol to public comment before embarking on the actual assessment process (IQWiG); public consultation processes on draft assessment reports (AHRQ, DERP, IQWiG); open review rounds upon publication of the report (KCE); and interaction with a body acting as a permanent advisor throughout the appraisal process (NICE Citizens Council).

Equity was mentioned as a contributing factor for topic selection in the documents of five institutions (AHRQ, DERP, G-BA, MSAC, PHARMAC). While in most cases this was kept general to include vulnerable groups and patient subgroups, PHARMAC explicitly mentioned advancing the health of the Maori/Pacific population in New Zealand as a prioritization criterion for assessments.

Evidence from HTA Reports

We identified ninety-eight reports from agencies included in the analysis, spanning drug, nondrug and population-based interventions (Table 1) and published between 2006 and 2011. Information on the prespecified domains was extracted and transferred to extraction tables (one report which addressed both drug and nondrug interventions was extracted twice).

As per the inclusion criteria, all reports included an assessment of effectiveness, while fifty-one reports (52 percent) also considered economic elements. Of those, twenty-six (51 percent) reported original economic evaluations based on a variety of methods, sixteen (31 percent) presented and discussed the results of existing economic studies, while a further nine (18 percent) provided information on direct costs with varying sources and level of detail.

Some agencies (DERP, TLV, G-BA, IQWiG for screening interventions) mention in their reports a general commitment to producing assessments that consider equity or fairness. Only one report had a term ("social inequalities") related to equity in the topic. This report adopted a clear equity focus and "applied an 'equity lens' to tobacco control policies, re-examining the available evidence about the impact of policy measures and other population-level interventions to assess their role in tackling health inequalities (. . .)" in a systematic way (33). Six reports included some element of equity in their objectives, three of which were concerned with addressing the issue of unequal access (due to regional or socioeconomic factors) and a further two with reducing inequalities in health (see Supplementary Table 3).

Methodological Elements. Nineteen reports (19 percent) included the consideration of population subgroups among their research questions. However, only five of those did so with an explicit link to contextual or socioeconomic elements or access to care while the rest were interested in the applicability of clinical effectiveness findings across population groups. Similarly, subgroup analyses were carried out or reported mainly to test the applicability of clinical findings for different groups of patients and not in relation to community effectiveness. Only seven reports included their own subgroup analyses, while thirteen (13 percent) pointed out that subgroup analyses were not possible based on the available primary research and thirteen (13 percent) reported subgroup analyses from individual primary studies. The determinants most frequently considered were age, gender, comorbidities and disease severity (in descending order). The dearth of evidence on specific populations (such as breastfeeding mothers of low socioeconomic status, migrant populations, etc.) was particularly highlighted by three reports with increased relevance for vulnerable groups, who are underrepresented among study participants.

Ten reports (10 percent) considered ethical and sociocultural elements separately as one of their assessment domains; of those, half did not succeed in finding any primary evidence to match the corresponding research questions. Three more reports mentioned that while such issues are important, they were beyond the scope of the presented document. Only one report involved a participatory approach with patients and their families to obtain relevant information to contextualize findings from published research.

Interpretation of Results and Recommendations in Included Reports. Eighteen reports (18 percent) included equity considerations in their interpretation of results (see Supplementary Table 3). These considerations encompassed elements of coverage (e.g., technology not covered or only covered by some regional plans in a decentralized context or high copayments putting low-income

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Table 2. Specific Methods Related to Health Equity

AHRQ	-Population and clinical subgroups considered at the topic development stage
	-Subgroup analyses or meta-regression to test for effect of specific characteristics (e.g., age, gender) in the body of studies
CADTH	-Subgroup analyses mentioned as analytical tool for clinical review and economic evaluation
	-Guiding principles of equity-efficiency trade-offs (identify groups the intervention is likely to benefit and impact; identify impact on cost and outcomes for persons not using the technology; consider differing cost-effectiveness results by subgroup; consider other equity implications in the analysis or additionally, examples provided including differential access, unmet need, rule of rescue)
	-Health Services Impact on health equity as additional domain
CRD	-Concrete tools to examine the influence of patient-level characteristics (determinants): subgroup analyses, meta-regression or modelling when sufficient primary information is available; exploring differential outcomes by levels of disadvantage for public health interventions
	-For reviews with equity-focus or that depict differences in groups: methods combining graphic and narrative elements for synthesis
DACEHTA	As an administrational/managerial tool: does the chosen combination of technology and management model support objectives of equal access to technology?
DERP	-To consider during the formulation of research questions: does effectiveness/harms vary by population subgroup based on demographics, socioeconomic status, comorbidities, co-medication
	-Subgroup analyses and meta-regression can be used to test for differences between groups in pooled analyses
DIMDI	Hand search required to identify sources for psychosocial elements (usual databases not sufficient)
G-BA	In the assessment of manufacturer submissions: consider specific population characteristics along the lines of age, gender, position in life, disability and chronic conditions
GÖG	-Matrix for exploring sociocultural elements incorporating stakeholder groups and different types of elements (psychosocial, ethical, legal, organizational)
	-Key questions to consider in this respect: distributive justice, i.e., does investing in the technology draw resources that will be missed elsewhere; are there social barriers to access; influence on inter-generational relations; shift in values (meaning of sick/healthy, vulnerable groups, etc.)
IQWiG	-If differentials across determinants are known/identified in advance, look for/perform pre-specified subgroup analyses
	-Always examine applicability of results according to age and gender
KCE	-Literature sources on patient perspective include Sociological Abstracts, PsycInfo, Embase, Medline; often additional sources may be required, such as patient organization websites
	-Qualitative methodologies to appraise patient issues (e.g., literature review, interviews or focus groups, round tables)
LBI	-Checklist for quality appraisal of economic evaluations: were equity assumptions clearly stated? Were relevant equity-related characteristics for subgroups identified and described?
MSAC	-Submissions need to provide tables on validity, accuracy, applicability which show indices of accuracy for relevant population subgroups
	-Submissions need to clearly state if the agency is to consider issues related to access or equity (e.g., targeting at risk populations; availability or lack of alternative options)
NICE	-In regards to economic evaluation: detailed prescriptions on QALYs, their estimation and weighting; Appraisal Committee needs to consider how its judgements bear on distributive justice
	-NICE Equality Scheme
PHARMAC	-Explicit focus on the health of Maori/Pacific population (also among agency goals)

groups at disadvantage), increased prevalence among vulnerable groups that would merit targeted interventions, variable uptake due to psychological elements connected to specific determinants (e.g., the higher uptake of bariatric surgery among women, reluctance to participate in cystic fibrosis screening for some ethnic groups and low awareness of sudden infant death syndrome in families with low socioeconomic status due to a different perception of danger) and organizational aspects that influence access to care.

Six reports on population-based interventions recommended the introduction or intensification of targeted interventions for vulnerable groups in their conclusions. A further six reports called for measures to ensure access, which took the form of revision of coverage plans, triage strategies for the equitable allocation of technologies, development of existing organizational structures to enable delivery and subsidies for vulnerable groups. Four reports included general statements endorsing a future societal perspective or universal access in their recommendations (see Supplementary Table 3).

Process-Related Elements. As was the case with the analysis of methodological documents, the availability of information on stakeholder involvement in included reports was variable; findings can, therefore, only be interpreted as indicative and not as a complete overview of approaches. Forty-three reports (44 percent) mentioned stakeholder involvement at some stage of the report production process. The most common form of involvement described was external review of the draft report, followed by

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participation in the determination of the scope and/or research questions before report production began. Input methods varied, but the online publication of documents (protocols and/or draft reports) was a common characteristic. Some institutions, like IQWiG, followed up on written public comment to the draft report with structured meetings when elements remained unclear. Eight reports mentioned that the topic for assessment originated in a nomination and/or prioritization process that incorporated public involvement.

DISCUSSION

Our findings indicate that equity was not a standard consideration in HTA reports. The nature of specific approaches, as well as the amount of resources invested into including an equity perspective, varied considerably. Where such approaches were used, they seemed to depend on the role and remit of the institution, its jurisdiction level, the legal context within the health system and finally the type of technology under consideration. For example, NICE, an institution that has long been a proponent of addressing equality issues in the evaluation of health technologies, launched a separate equality scheme in 2007. The scheme aimed to put the Institute's commitment to fighting discrimination and fostering equal opportunities in practice, both by ensuring fair and appropriate representation in advisory bodies and applying a set of equity-related questions throughout the guidance production process (34). It is unlikely that HTA agencies with fewer resources or a narrower scope would be able or required to establish similar approaches. Still, an equity-sensitive approach introduced early in the process of report production could increase the likelihood that potential issues are not overlooked (12) and that the appropriate questions are asked and methods of analysis used. It would, therefore, be preferable in comparison to an additional consideration of potential equity concerns after effectiveness or cost-related questions have been answered.

While the consideration of equity issues in the analyzed reports was sporadic, it encompassed both concerns of vertical and horizontal equity: targeted interventions were endorsed by some reports and differential outcomes or consequences for universal applications of technologies were raised in others. While prioritizing the evaluation (and funding) of targeted interventions for specific population groups to reduce health inequities is vital, it also depends on individual agency or policy agendas. It is important to recognize that health technologies not aimed at bridging the equity gap still need to be addressed in an equity-sensitive way as they may introduce, perpetuate or exacerbate inequities that are not apparent prima vista.

An equity-sensitive approach adopted in the early stages of assessment would mean that specific population groups that merit attention are taken into account while formulating the research questions, exploring the context of technology implementation, or choosing appropriate evidence types and study designs for the assessment (9;10;15;16;23). However, methods used in the analysis also need to reflect these steps. Our findings show that subgroup analyses were rarely conducted by the institutions themselves. When they were discussed, it was usually in regard to the applicability of overall findings for population groups with different biological or clinical characteristics and not in connection to contextual or other equity-related factors. Analytical tools such as subgroup analyses need to be appropriately applied to avoid misinterpretation (10;22;35) and require sufficient and adequate information from primary studies. In fact, some included reports mentioned that subgroup analyses were not possible due to insufficient data.

Other reports in our sample concluded that more primary research tailored to enable insights into inequities was required in general. The issue of adequate primary studies as a prerequisite for equity considerations had already been raised by Whitehead (2) and the particular necessity of good data for equity-sensitive evaluations was further emphasized by Tugwell and colleagues (15). While it is hoped that the promotion and usage of equity-oriented tools developed for evidence syntheses will lead to corresponding initiatives in primary research in the long-run (16), a more active endorsement would definitely be beneficial.

Procedural equity is not only important from the viewpoint of fair representation. Stakeholder involvement, when structured accordingly, can also contribute to pinpointing the questions to ask and what is important. This is particularly the case when it includes those most directly affected by a technology's implementation, namely patients and their caregivers. The type and entry point of involvement is expected to vary based on agency tradition and system context (32;36). This was mirrored by findings from included reports, which mentioned consultation and/or participation approaches. Participation in the early stages of report production, for instance at the protocol development stage, can be particularly useful in revealing equity issues that may need to be considered throughout the assessment. Furthermore, an inclusion of stakeholder groups and especially patients in the agenda setting for assessments (37) can foster the goal of evaluating technologies to address inequalities. In both respects, existing agency approaches can be expanded or modified to enable a clearer, more direct link between stakeholders and an equity-sensitive approach. At this point, it is important to note that if such approaches have an additional goal of facilitating equity-sensitive evaluations, those included need to be carefully selected to ensure that important perspectives are not missed; which parties to involve has already been found to be one of the main challenges for agencies using related processes (31;32).

Ideally, a fully realized equity perspective in the assessment of health technologies would entail a multifaceted approach spanning protocol development to dissemination and using both equity-aware staff and inclusive stakeholder involvement. However, the need for swift assessment results along with

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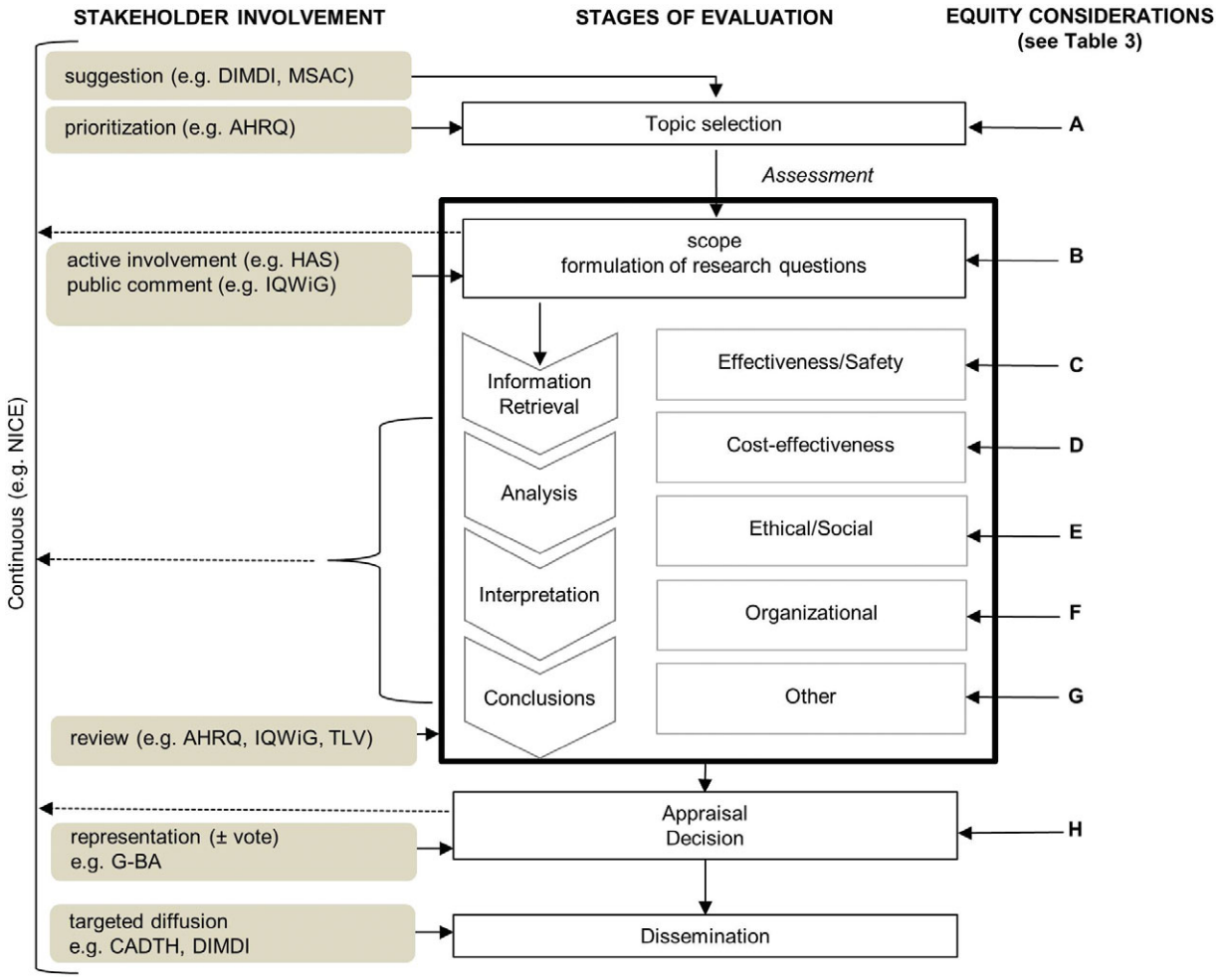

Figure 1. Potential equity considerations along the evaluation process.

Table 3. Examples of Equity Considerations Depicted in Figure 1

A	Equity in prioritization agenda [37], e.g., AHRQ, G-BA, PHARMAC
B	Definition of disadvantage; burden of disease; contextual factors (community effectiveness); appropriate outcomes and sources; study designs, measurement tools, etc. [12, 14–16] e.g., DERP, IQWiG
C	Subgroup analyses (preferably prespecified; if only reported consider robustness and interpretation [9, 10, 35]) e.g., CRD, IQWiG, MSAC
D	Descriptive approaches, ICER for different subgroups, equity weighting, mathematical models, MDCA [17–19] e.g., CADTH, NICE
E	Appropriate sources and study designs (e.g. DIMDI), analytical tools (e.g., GÖG)
F	Consideration of roll-out factors related to access (e.g., DACEHTA), delivery of care [12]
G	Health impact assessment, additional consideration of equity-efficiency elements, e.g., CADTH
H	Contextual factors, e.g. G-BA, MSAC, NICE; [12, 23, 24] institutional biases, special claims, etc. [12]

resource considerations can hamper both the implementation of equity-sensitive tools that are detailed and comprehensive (38) and the elaboration of participatory mechanisms (31). According to their task, process, and resources, HTA agencies interested in adopting a more equity-sensitive approach may need to choose their areas of focus. Figure 1 combines examples of approaches identified in our analysis (institutional names) and insight from methodological literature (references in square brackets in Table 3) to provide an overview of potential points for consideration.

STRENGTHS AND LIMITATIONS

Our study provides the first comprehensive overview of equity-related considerations found in methodological papers and HTA reports from a broad range of agencies at the international level.

Our selection of agencies and reports aimed to capture insights from different types of institutions and on a variety of technologies. However, language barriers brought about an imbalance in the composition of the sample, as noted in the results. Furthermore, detailed information on agency practices was not always publicly available and led to more agencies being excluded from the analysis. The concrete inclusion criteria of the structured approach regarding interactions of identified agencies, eliminated additional agencies and methodological documents that might have had interesting contributions to offer. Information provided in more recent iterations of methodological papers was not considered. Finally, approaches that are in place but were not described in the identified documentation are not captured in this publication (see also Clifford, 28); despite our best efforts, we cannot rule out the possibility that certain available information was overlooked. To our knowledge, at the time of extraction and analysis there were no established standards as to what is considered an equity-sensitive approach in HTA; therefore, our extraction tools were formulated broadly and ad hoc, potentially subjective decisions had to be made during the extraction process. As a result, the presented analysis is rather indicative than definitive in nature. The same is true regarding the depiction of approaches toward stakeholder involvement, as it is only based on information available in analyzed documents; the consultation of published and grey literature would be required for a more comprehensive view (31;32;36;39). Finally, the selection of methodological papers and reports (and thus their publication date) preceded the publication of important tools (12;16); it would, therefore, be interesting to follow-up on our findings when sufficient time has elapsed and explore potential changes in practice.

POLICY IMPLICATIONS AND RECOMMENDATIONS

Varying legal contexts and institutional principles can lead to different interpretations of equity at the decision point. Overall, the consideration of equity-related issues was found to be sporadic. However, a combination of methodological and process-related practices already in place could contribute to more equity-sensitive evaluations. Incorporating equity concerns in the assessment of health technologies is important both for universal coverage decisions and in terms of facilitating targeted interventions. Agencies involved in the production of HTAs can and should take action on the matter. Several policy implications stem from this position:

1. Awareness among HTA-doers needs to be raised and required skills (such as understanding the importance of PROGRESS-Plus factors) need to be acquired or expanded;

2. Given that various methodological and process-related approaches are already used by individual agencies, knowledge exchange and collaboration could be key. Such an exchange could be facilitated by existing collaborative platforms in HTA. Given the nature of the topic, a more focused initiative, such as an Interest Subgroup on Equity, could help in emphasizing exemplary practices. Furthermore, it could aid in the dissemination and potential adaptation of existing tools to overcome the barrier of limited resources. Such an Interest Subgroup would be bound to intersect with existing ones, such as the ones on Ethics and Patient Involvement;

3. Both individual agencies and a potential coordinating initiative could consider training for staff and/or stakeholders, both on understanding equity concerns and including them into standard practice; joint training initiatives may help with feasibility in light of resource constraints;

4. The adequacy of primary research will highly influence to what extent equity concerns can be included in HTA. Agencies and their collaborative initiatives could endorse such a research agenda.

CONCLUSIONS

While methodological tools for the incorporation of equity considerations in the assessment of health technologies exist, it is not clear to what extent HTA agencies are aware of them or have the resources required to implement them. In addition to initiatives that could potentially be adopted by individual agencies, existing practices indicate that knowledge exchange would be particularly beneficial. Such an exchange could be coordinated by existing collaborative platforms or potentially, in a more targeted manner, by an Interest Subgroup on Equity.

SUPPLEMENTARY MATERIAL

Supplementary Tables 1–3
Supplemetnary Figure 1
http://dx.doi.org/10.1017/S0266462315000549

CONFLICTS OF INTEREST

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