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WHICH CRITERIA ARE CONSIDERED IN HEALTHCARE DECISIONS? INSIGHTS FROM AN INTERNATIONAL SURVEY OF POLICY AND CLINICAL DECISION MAKERS

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Objectives: The aim of this study was to gather qualitative and quantitative data on criteria considered by healthcare decision makers.
Methods: Using snowball sampling and an online questionnaire with forty-three criteria organized into ten clusters, decision makers were invited by an international task force to report which criteria they consider when making decisions on healthcare interventions in their context. Respondents reported whether each criterion is "currently considered," "should be considered," and its relative weight (scale 0–5). Differences in proportions of respondents were explored with inferential statistics across levels of decision (micro, meso, macro), decision maker perspectives, and world regions.
Results: A total of 140 decision makers (1/3 clinical, 2/3 policy) from 23 countries in five continents completed the survey. The most relevant criteria (top ranked for "Currently considered," "Should be considered," and weights) were *Clinical efficacy/effectiveness, Safety, Quality of evidence, Disease severity,* and *Impact on healthcare costs*. Organizational and skill requirements were frequently considered but had relatively low weights. For almost all criteria, a higher proportion of decision makers reported that they "Should be considered" than that they are "Currently considered" ($p < .05$). For more than 74 percent of criteria, there were no statistical differences in proportions across levels of decision, perspectives and world regions. Statistically significant differences across several comparisons were found for: *Population priorities, Stakeholder pressure/interests, Capacity to stimulate research, Impact on partnership and collaboration,* and *Environmental impact*.
Conclusions: Results suggest convergence among decision makers on the relevance of a core set of criteria and on the need to consider a wider range of criteria. Areas of divergence appear to be principally related to contextual factors.

Keywords: Criteria, Decision making, Priority setting, Multicriteria, Health care

With increasing healthcare costs and patient exposure to healthcare technologies, effective approaches to explicit decision making in health technology assessment (HTA) and priority setting are becoming critical to allocate limited resources. Decision making is a complex process involving consideration of

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Data acquisition: N.T., M.T., M.G.;
Data analyses & interpretation: N.T., M.G., M.W., M.T., J.V.T., D.R.;
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criteria, evidence and value judgments (1). Elucidating which criteria are used is key to making decisions that will improve health and uphold healthcare systems sustainability, equity, and efficiency. As stated in the A4R framework, "Decisions should be made on the basis of reasons (i.e., evidence, principles, values, arguments) that 'fair-minded' stakeholders can agree are relevant under the circumstances" (2).

The cost-effectiveness paradigm has some limitations (3) as additional criteria are critical to policy and clinical decisions that implicitly or explicitly prioritize interventions and thus shape the healthcare system. At each decision level, decision makers need to be aware of criteria that are specific to their scope (e.g., risk benefit for regulatory approval) (4) but also the criteria important for other decision levels (e.g., budget impact for payers, patient-reported outcomes for clinicians and patients, unmet needs for developers). Lack of awareness of the criteria that are considered across the decision making continuum as well as lack of transparency in decision making can potentially create tensions among stakeholders. For example, failure to consider opportunity costs at the macro level might lead to decisions that leave budget holders with tough situations (5). Identifying which criteria are used across decision makers is a first step to paving the road for more explicit decision making across the healthcare continuum.

A substantial volume of research has been published on systematic approaches to optimizing healthcare decision making, including multicriteria tools to evaluate and rank interventions (6–14). A review of the literature on decision criteria and multicriteria tools highlighted the need for both normative (i.e., what we should do) and feasibility criteria (i.e., what we can do) in decision tools to fully support decision making (15). This review also revealed that the terminology of criteria is highly variable underlining the challenge of harmonizing decision-making processes, a point raised by others (16), and highlighting the need for well-defined criteria for sound multicriteria applications.

The primary objective of this study was to gather directly from healthcare decision makers data on the decision criteria used at micro, meso and macro levels, and explore convergence and divergence across decision makers at a global level. Secondary objectives were to explore decision makers' views on what is being done versus what should be done to provide insight for the development of useful applications. Finally, the underlying objective was to stimulate reflection on current decision making approaches and contribute to the adoption of transparent and accountable processes across the continuum of healthcare decision making.

METHODS

Design

This study targeted a minimum of 100 healthcare decision makers, including: (i) *policy decision makers*: making decisions/recommendations on reimbursing, implementing or prioritizing health care interventions at the *macro* (national, provincial, regional) and *meso* (institutional) levels; and (ii) *clinical decision makers*: physicians and other healthcare professionals who make decisions/recommendations on prescribing healthcare interventions at the *micro* (individual) level.

Using a Web content management system Tikiwiki v6.0, a questionnaire, collecting both qualitative and quantitative responses, was developed in several steps featuring forty-three criteria organized into ten clusters (see Table 2 and Figure 1 for all criteria and clustering) (The questionnaire is available at Web link for Supplementary Figure 1, which can be viewed online). First, a questionnaire was designed based on (a) multicriteria decision analysis (MCDA) principles and clustering as implemented in an established MCDA framework (14) and (b) a series of workshops with the leadership team (i.e., authors) informed by the results of a literature review on healthcare decision criteria (15). Second, the draft questionnaire thus developed was circulated to collect additional input from an international task force of thirty healthcare researchers/decision makers from seventeen countries recruited by the leadership team. Third, the questionnaire was pilot-tested with graduate students enrolled in two healthcare management programs at the University of Montreal.

The questionnaire prompted respondents to anonymously state their decision making setting (either policy or clinical), perspective, affiliation, level and type of institution, and country. Respondents were then asked for each of the forty-three criteria whether it is "Currently considered" (yes/no/not applicable), whether it "Should be considered" (yes/no/not applicable) and to weight its relative importance on a 5-point scale from 0 to 5 (the 0 weight was included to confirm that a criterion is/should not be considered) from their individual perspective. These three pieces of data capture distinct concepts. For example, respondents may indicate that a given criterion should be considered but assign it a low weight to reflect low importance relative to other criteria. Or, decision makers may report that a given criterion is not "Currently considered" but indicate that it "Should be considered" reflecting a perceived need to modify the current approach. Participants were also prompted to provide qualitative comments for each criterion of the survey. These comments were reviewed and incorporated into the discussion on a by-criterion basis.

Decision makers were identified and invited to participate in the survey by the leadership team or members of the international task force. Several professional associations were invited to participate and four of them distributed the survey invitation to their membership *via* newsletters or email (Health Technology Assessment International, HTAi; the International Society on Priorities in Health Care, ISPHC; the EVIDEM Collaboration; and the Society for Medical Decision Making, SMDM). Using an open snowball sampling approach, participating decision makers were also invited to circulate the survey

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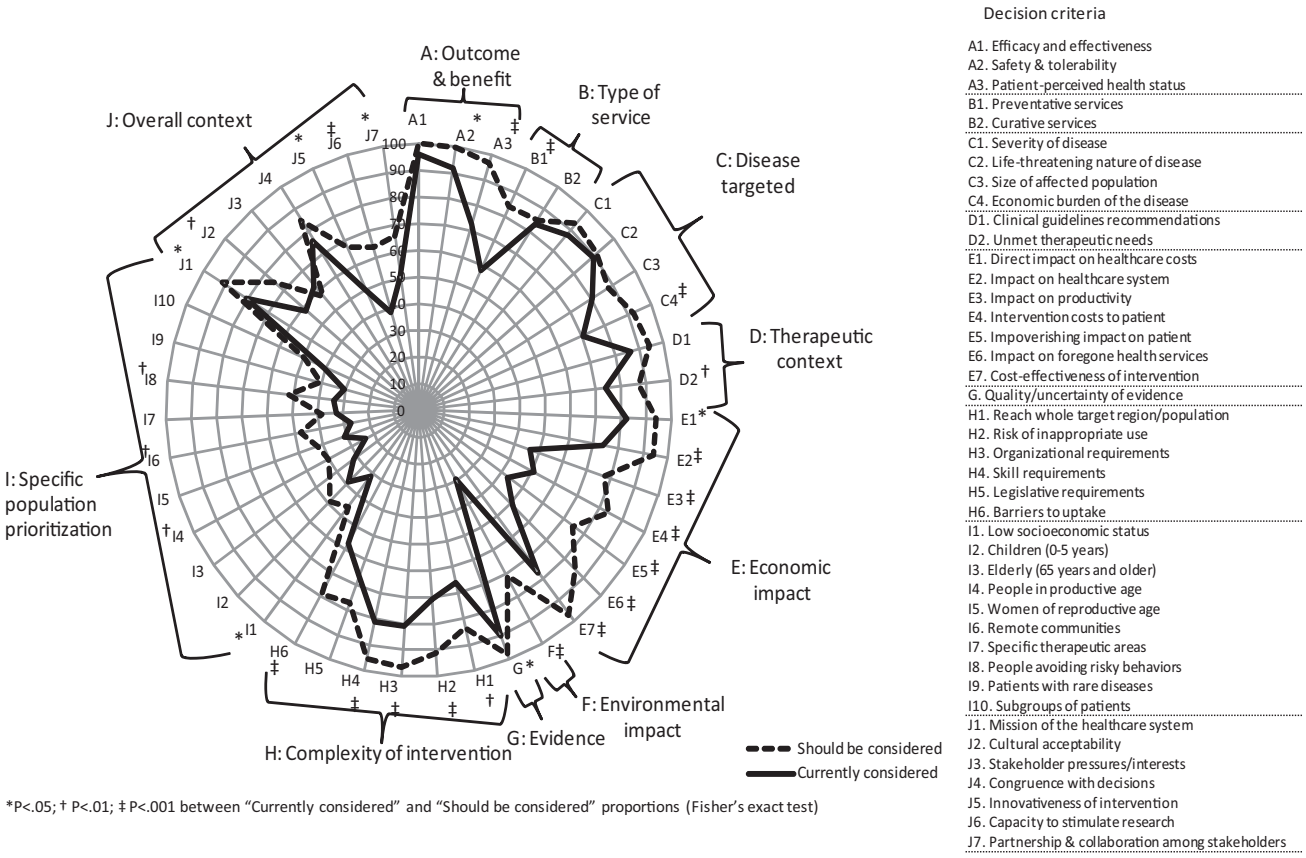

Figure 1. Percentages of respondents reporting that a specific criterion is currently considered or should be considered.

to their colleagues involved in policy or clinical decision making.

The study was approved by the Board of Ethics of the University of Montreal.

Data Collection and Analysis

Data was collected between January 11, 2012, and May 1, 2012, *via* the Web interface and exported to Excel. Descriptive statistics were used to analyze respondent characteristics (type of decision maker, perspective used, level of decision, status of institution, type of affiliation, and country). For each criterion, the proportions of respondents reporting that they consider it and that it should be considered were calculated. Mean criteria weights were calculated by averaging the weights between 1 and 5 given by respondents. The zero (0) weight was excluded from mean weight calculations because it confirms that a given criterion is not considered, that is, it is excluded from the decision making process, and thus does not have importance relative to the criteria that are considered. (Responses indicating that a criterion is considered, while at the same time providing a weight of 0, were viewed is inconsistent and excluded from the analysis. Less than 1 percent of weights were excluded on this basis.) In five instances in which respondents indicated that a criterion was not considered and should not be considered but reported weights other than 0, these weights were excluded from calculation because of the inconsistency of the responses.

Fisher's exact test was used to analyze differences between proportions of respondents indicating that a given criterion "Should be considered" versus that it is "Currently considered." The Chi square test was used to analyze differences in proportions of respondents considering a given criterion across different levels of decision (micro, meso, macro), policy perspectives and world regions. The Kruskall Wallis test was used to detect differences in criteria weights. Statistical analyses were performed using GraphPad prism Software V5.04.

RESULTS

Survey Respondents

The survey was completed by 140 respondents from twenty-three countries: ninety-four policy decision makers and forty-six clinical decision makers (details in Table 1). Almost half of respondents were decision makers at the macro (regional, provincial or national) level and represented mostly public institutions. Policy decision makers were equally distributed across three perspectives: administrator, healthcare professional, and researcher. Clinical decision makers were mostly physicians with specialty practices. Half of the respondents were from

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Europe and North America ($n = 49$ and 34, respectively) followed by Africa ($n = 21$) and Asia-Pacific and South America ($n = 18$ each). Clinical and policy decision makers' distribution within regions was similar to the full sample distribution.

Decision Criteria Consideration and Weights

Figure 1 shows proportions of respondents reporting a given criterion is "Currently considered" or "Should be considered." The ten most common currently considered criteria were A1 (Table 2): Clinical efficacy and effectiveness (96 percent), A2: Safety and tolerability (92 percent), G: Quality/uncertainty of evidence (91 percent), C2: Life-threatening nature of disease (90 percent), C1: Severity of disease (89 percent), D1: Intervention endorsed in clinical guideline recommendations (87 percent), B2: Prioritize curative services (84 percent), E1: Direct impact of intervention on healthcare costs (83 percent), H3: Organizational requirements (82 percent) and H4: Skill requirements (81 percent). Seven of these top ten "Currently considered" criteria were also among the top ten "Should be considered" criteria (Table 2); the three exceptions were C1: Severity of disease (94 percent, rank 11), C2: Life-threatening nature of disease (92 percent, rank 13) and B2: Prioritize curative services (85 percent, rank 19) (see details in Table 2). Conversely the three criteria figuring among the top 10 "Should be considered" criteria but not among the top ten "Currently considered" were: E7. Cost-effectiveness of intervention (97 percent, rank 4), A3. Improvement of patient-perceived health status (96 percent, rank 6) and E2. Impact of intervention on the healthcare system (95 percent, rank 8).

For all except one criterion (J3: Stakeholder pressure/interest), a greater proportion of respondents reported that they "Should be considered" than that they are "Currently considered." These differences were statistically significant for 28 of the 43 criteria. Very highly significant differences ($p < .0001$) were detected for five criteria (Figure 1): F: Environmental impact of the intervention (30 percent "Currently considered" versus 71 percent "Should be considered"), E6: Impact of intervention on other health services that may be forgone (52 percent versus 86 percent), E4: Intervention costs to patient (51 percent versus 84 percent), E3: Impact of intervention on productivity (46 percent versus 77 percent) and E5: Impoverishing impact of intervention on patient (47 percent versus 75 percent).

Regarding whether prioritization of specific populations is "Currently considered," 75 percent of respondents indicated that they prioritized at least one of the populations listed. For any specific population, 24 percent to 40 percent of respondents reported that it is currently prioritized, lower than observed for other criteria (30–96 percent), which may be attributed to the more mutually exclusive nature of population priorities (Figure 1 and Table 2). Most respondents reported currently prioritizing Subgroups of patients (40 percent) and Children age 0 to 5 years (39 percent).

Table 1. Respondents Characteristics ($N = 140$)

Characteristics	*N*	%
Type of decision maker		
Policy	94	67
Clinical	46	33
Level of decision		
Micro	46	30
Meso	20	14
Macro	66	47
Not available	8	6
Decision making perspective		
Policy decision makers		
Administrator	34	36
Healthcare professional	30	32
Researcher	25	27
Not available	5	5
Clinical decision makers		
Physician: general practice	9	20
Physician: specialty practice	27	59
Other: healthcare professional	10	22
Geographical distribution		
Africa	*21*	*15*
Ivory Coast	7	
Kenya	2	
Nigeria	1	
South Africa	8	
Tanzania	2	
Zambia	1	
Asia-Pacific	*18*	*13*
Australia	3	
India	10	
New Zealand	5	
Europe	*49*	*35*
Belgium	1	
Germany	5	
Ireland	1	
Italy	1	
Netherlands	2	
Norway	1	
Portugal	11	
Sweden	13	
Switzerland	1	
UK	13	
North America	*34*	*24*
Canada	30	
USA	4	
South America	*18*	*13*
Brazil	17	
Colombia	1	

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Table 2. Criteria Presented in the Questionnaire with Ranks, Proportions of Respondents, and Mean Weights: Five Core Criteria Are Highlighted

	Currently considered		Should be considered		Mean weight*	
	Rank	Proportion of respondents (%)	Rank	Proportion of respondents (%)	Rank	Mean weight (±SD)
A. Intervention outcomes and benefits						
A1.Improvement clinical efficacy and effectiveness	1	96	1	100	1	4.6 (± 0.7)
A2.Improvement of safety & tolerability	2	92	2	99	2	4.4 (± 0.8)
A3.Improvement of patient-perceived health status	17	73	6	96	14	3.9 (± 1.0)
B. Type of health service						
B1.Preventative services	24	58	22	84	4	4.2 (±1.0)
B2.Curative services	7	84	19	85	7	4.2 (± 0.9)
C. Disease impact (burden)						
C1.Severity of disease	5	89	11	94	5	4.2 (± 0.9)
C2.Life-threatening nature of disease	4	90	13	92	3	4.3 (± 1.0)
C3.Size of population affected by disease	12	80	16	88	10	4.1 (± 1.0)
C4.Economic burden of the disease	19	72	12	92	22	3.8 (± 1.1)
D. Therapeutic context						
D1.Clinical guidelines recommendations on intervention	6	87	9	94	17	3.9 (± 1.1)
D2.Unmet therapeutic needs	15	74	17	88	30	3.6 (± 1.1)
E. Economic impact						
E1. Direct impact of intervention on healthcare costs	8	83	10	94	11	4.0 (± 0.9)
E2.Impact of intervention on healthcare system	15	74	8	95	18	3.8 (± 1.1)
E3.Impact of intervention on productivity	30	46	25	77	41	3.4 (± 1.2)
E4.Intervention costs to patient	27	51	21	84	29	3.6 (± 1.1)
E5.Impoverishing impact of intervention on patient	31	43	27	75	28	3.7 (± 1.2)
E6.Impact of intervention on other health services that may be forgone	26	52	18	86	34	3.6 (± 1.2)
E7. Cost-effectiveness of intervention	13	77	4	97	6	4.2 (± 0.9)
F. Environmental impact of the intervention	41	30	29	71	38	3.4 (± 1.2)
G. Quality/uncertainty of evidence	3	91	3	98	8	4.2 (± 0.9)
H. Implementation complexity						
H1.Ability to reach the whole target region/population	21	66	23	84	27	3.7 (± 1.1)
H2.Risk of inappropriate use	18	71	15	91	33	3.6 (± 1.0)
H3.Organizational requirements (process, equipment, and premises)	9	82	5	96	31	3.6 (± 1.0)
H4.Skill requirements	10	81	7	95	24	3.7 (± 1.1)
H5.Legislative requirements	20	66	26	77	12	4.0 (± 1.0)
H6.Institutional/personal barriers to uptake	25	57	24	79	39	3.4 (± 1.0)
I. Priorities (fairness)						
I1.Low socioeconomic status	38	31	38	46	13	4.0 (± 1.0)
I2.Children (0–5 years)	33	39	35	50	9	4.1 (± 1.0)
I3.Elderly (65 years and older)	37	32	39	44	15	3.9 (± 1.0)
I4.People in productive age	44	24	42	41	25	3.7 (± 1.1)
I5.Women of reproductive age	39	31	40	43	15	3.9 (± 1.0)
I6.Remote communities	43	28	37	48	31	3.6 (± 1.0)
I7.Specific therapeutic areas	36	33	44	39	20	3.8 (± 1.1)
I8.People avoiding risky behaviors (*e.g., smoking*)	35	34	34	52	21	3.8 (± 1.1)
I9.Patients with rare diseases	40	31	43	40	37	3.5 (± 1.2)
I10.Subgroups of patients	32	41	35	50	23	3.7 (± 1.1)

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Table 2. Continued

	Currently considered		Should be considered		Mean weight*	
	Rank	Proportion of respondents (%)	Rank	Proportion of respondents (%)	Rank	Mean weight (±SD)
J. Overall context						
J1.Mission and scope/mandate of the healthcare system	11	80	13	92	19	3.8 (± 1.0)
J2.Cultural acceptability	23	58	27	75	42	3.4 (± 1.2)
J3.Stakeholder pressures/interests (peers, advocacy groups, etc.)	22	62	33	57	43	3.0 (± 1.2)
J4.Congruence with previous and future decisions	14	76	19	85	36	3.5 (± 1.1)
J5.Innovativeness of intervention	29	50	30	67	26	3.7 (± 1.1)
J6.Capacity to stimulate research	34	38	32	64	40	3.4 (± 1.1)
J7.Impact on partnership & collaboration among healthcare stakeholders	28	50	31	66	35	3.6 (± 1.2)

*On a scale of 1 to 5. Weights for criteria reported being not considered were excluded. Inconsistent responses (i.e., criterion considered but weight 0) also excluded (< 1% of weights).

The greatest weights (Table 2) were given to A1: Clinical efficacy/effectiveness (4.6 ± 0.7), A2: Safety & tolerability (4.4 ± 0.8), C2: Life-threatening nature of disease (4.3 ± 1.0), B1: Prioritize preventative services (4.2 ± 1.0), C1: Severity of disease (4.2 ± 0.9), E7: Cost-effectiveness of intervention (4.2 ± 0.9), B2: Prioritize curative services (4.2 ± 0.9), G: Quality/uncertainty of evidence (4.2 ± 0.9), I2: Prioritization of children (4.1 ± 1.0) and C3: Size of population affected by disease (4.1 ± 1.0). The least weight was given to J3: Stakeholder pressures (3.0 ± 1.2).

Overall, five criteria appeared to be most relevant to surveyed decision makers, because they figured high among "Currently considered" and "Should be considered" criteria and also ranked high with respect to weights: A1: Clinical efficacy/effectiveness, A2: Safety & tolerability, G: Quality/uncertainty of evidence, C1: Severity of the disease and E1: Direct impact on healthcare costs (Table 2).

Comparisons of Responses Across Decision Makers Subgroups

Comparisons of responses across policy decision makers perspectives (administrator, healthcare professional, researcher) are reported in Figure 2. Statistically significant differences ($p < .05$) in the proportions of respondents "Currently considering" any given criterion were observed for 10 of the 43 criteria (23 percent) (Figure 2B), most strikingly ($p < .001$) for J7: Impact on partnership & collaboration among healthcare stakeholders and ($p = .0026$) and J6: Capacity to stimulate research (both considered by relatively fewer researchers and more administrators). Regarding proportions of respondents stating that a criterion "Should be considered," statistically significant differences ($p < .05$) were found for three criteria. Although not statistically significant, the largest variations in weights among policy decision makers' perspectives were observed for criteria concerning prioritization of specific populations (data not shown).

Across decision making levels (micro, meso, macro) (Supplementary Figure S2, which can be viewed online), statistically significant differences ($p < .05$) in the proportions of respondents who "Currently consider" any given criterion were observed for 11 of the 43 criteria (26 percent), most strikingly ($p < .01$) for: J3: Stakeholders pressures (considered by relatively fewer micro decision makers); B2: Prioritization of curative services (considered by relatively fewer macro decision makers); and J6: Capacity to stimulate research (considered by relatively more meso decision makers). Regarding proportions of respondents stating that a criterion "Should be considered," statistically significant differences ($p < .05$) were found for only four criteria, three of which were the same as for the "Currently considered" criteria. For weights, the largest differences across decision levels were observed for criteria concerning the prioritization of specific populations (data not shown); none of them was statistically significant.

Across world regions (Africa, Asia-Pacific, Europe, North America, South America), the proportions of respondents "Currently considering" a given criterion showed statistically significant differences ($p < .05$) for 11 of the forty-three criteria (26 percent) (Supplementary Figure S3, which can be viewed online). Seven of these concerned the prioritization of specific populations, most strikingly I1: Low socioeconomic status ($p < .0001$), I2: Children (0–5 years) ($p = .0001$), and I6: Remote communities ($p = .0002$). Regarding proportions of respondents stating that a given criterion "Should be considered," statistically significant differences ($p < .05$) were found

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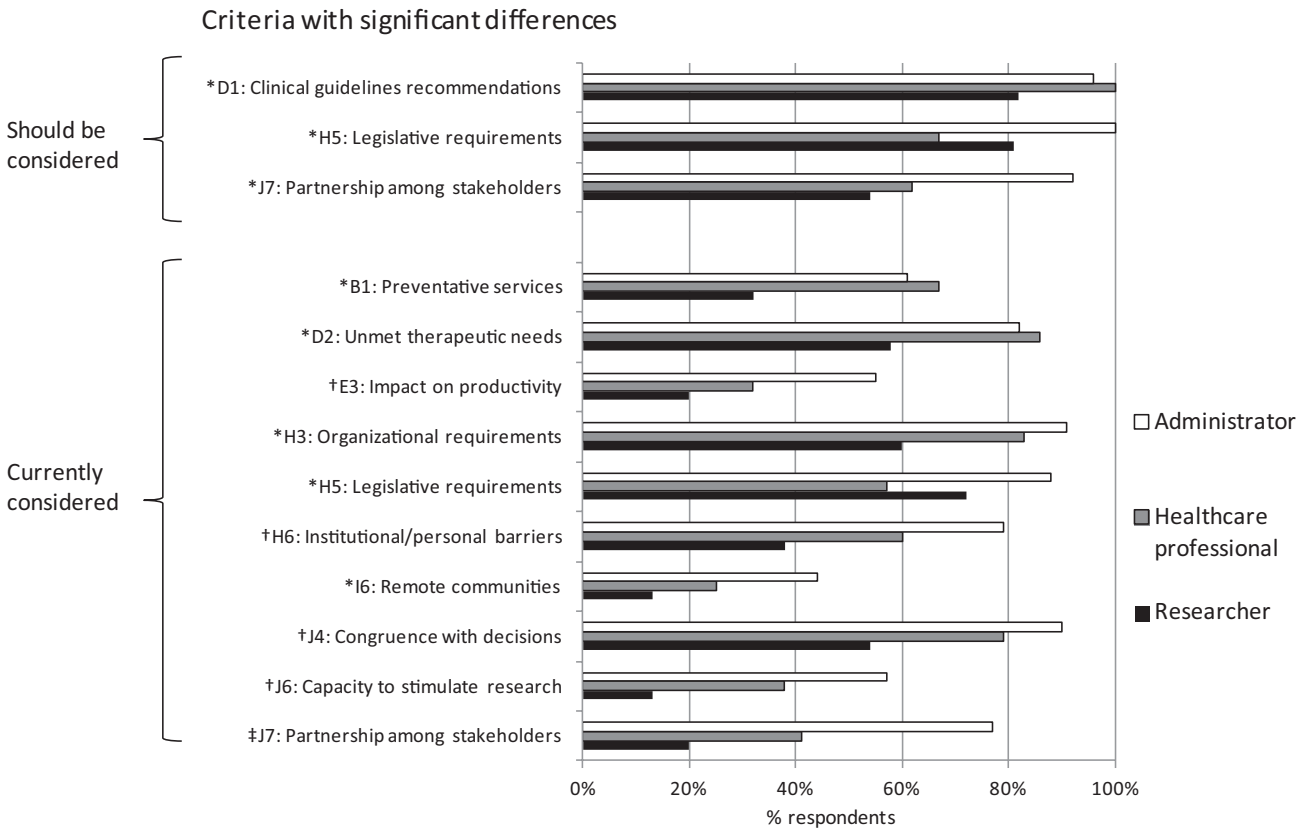

Only criteria for which statistically significant differences were seen among subgroups of respondents are displayed.
* $P<.05$; † $P<.01$; ‡ $P<.001$ (Chi-square test)

Figure 2. Percentages of respondents reporting that a specific criterion is currently considered or should be considered by policy decision maker perspective.

for fourteen criteria, eight of which concerned the prioritization of specific populations. For weights, although not statistically significant, the largest differences across regions were observed for C4: Economic burden, I9: Prioritization of patients with rare diseases and J7: Impact on partnership & collaboration among healthcare stakeholders (data not shown).

DISCUSSION

In this survey, the most relevant criteria to healthcare decision makers (top ranked for "Currently considered," "Should be considered," and weights) were Clinical efficacy/effectiveness, Safety, Quality of evidence, Disease severity, and Impact on healthcare costs. Organizational and skill requirements ranked high among the criteria with respect to being considered but had relatively lower weights. For most criteria, the proportions of decision makers reporting that they "Should be considered" were higher than those reporting they are "Currently considered" ($p < .05$). For more than 74 percent of criteria, there were no statistically significant differences in responses across decision levels, perspectives and world regions. Across several comparisons statistically significant differences were found for: Population priorities, Stakeholder pressure/interests, Capacity to stimulate research, Impact on partnership and collaboration, and Environmental impact ($p < .05$). These results suggest a convergence toward a core set of normative and feasibility criteria and a need to consider a wider range of criteria in decision making. Areas of divergence appear to be principally related to contextual factors.

In this survey, normative criteria were considered by a greater proportion of respondents than feasibility criteria, in agreement with previous studies (15;17). Six of the top ten "Currently considered" criteria in this survey also figured among the top ten criteria identified in a recent literature review: Efficacy/effectiveness, Safety, Quality of evidence, Equity/fairness, Impact on healthcare costs, and Organizational requirements (15).

All survey respondents agreed that clinical efficacy/effectiveness and safety should be considered, giving them the greatest weights regardless of decision level, perspective or world region. Clinical benefit is the most important criterion in real-world settings (18) and is fundamental at the regulatory and reimbursement levels. Identifying the clinical outcomes

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(subcriteria) on which to compare efficacy/effectiveness and safety is critical to fully assess therapeutic benefit. MCDA is currently explored at the regulatory level to define the most relevant risk/benefit outcomes for each treatment and disease (4). Because healthcare interventions are evaluated in the context of current standard of care, comparative efficacy/effectiveness and safety are being considered to promote decisions that minimize waste from ineffective or inappropriate interventions. Thus, the data needed to assess interventions against these criteria needs to be comparative in nature ("comparative effectiveness research") (19). In addition to clinical studies, real life data (e.g., pragmatic trials, registries) is increasingly generated to more fully inform decision makers of relevant effectiveness and safety outcomes over the life cycle of interventions.

Quality of evidence was the third most commonly considered criterion by respondents (91 percent). Quality of evidence is a key determinant for strength of recommendation for or against an intervention and helps generate consensus among competing views, which may lead to similar recommendations from different parties (20). Resources to assess the quality of different types of evidence are available and include among others, for example, GRADE (21) for clinical evidence and CHEC, for economic evaluations (21;22).

Disease severity and its life-threatening nature figured among the most commonly considered and the most important criteria to respondents, underlining the key role of ethical imperatives in healthcare decisions. Regarding fairness in resource allocation, approximately 75 percent of respondents reported prioritizing at least one specific population, most commonly "Subgroups of patients," highlighting the importance of targeting patients who may benefit most, and "Children age 0 to 5," highlighting the importance of considering vulnerable populations. Several Canadian respondents commented that "certain therapeutic areas were sometimes prioritized due to political pressures," while a Brazilian respondent indicated that priorities were for areas "where there are no treatments currently covered by public system." A US respondent commented that priorities were given to "those with terminal conditions with no known effective clinical interventions." Survey results also showed that more decision makers prioritize curative services (84 percent) than preventative services (58 percent), indicating the importance of helping those who are worst-off, while keeping in mind the need for prevention to reduce both the health and economic burden of disease. The size of the population was also a commonly considered criterion suggesting that ethical consideration of providing the greatest benefit to the greatest number is also important to decision makers. Ethical factors are an integral part of HTA and MCDA models such as the EUnetHTA core model (23) and the EVIDEM framework (14) which were designed to ensure their explicit consideration. Several frameworks focusing on equity have also been proposed (3;16;24).

The direct impact of an intervention on healthcare costs is another core criterion identified in this study that is currently considered by most decision makers, reflecting a broad awareness that healthcare resources are limited. Even though many reimbursement agencies, including NICE in the United Kingdom and CADTH in Canada require cost-effectiveness data in addition to the direct economic impact on healthcare costs, among the seven economic criteria, only the direct impact on healthcare costs figured among the top ten most common currently considered criteria by the respondents. Nonetheless, cost-effectiveness appears to be important, as reflected by its fourth rank among the "Should be considered" criteria and its high weight. Opportunity costs (E6: Impact of intervention on other health services that may be forgone) are currently considered by only 51 percent of all decision makers while 86 percent believe that these costs should be considered ($p < .0001$). A UK policy decision maker commented that "opportunity cost is real and now and applies to my population," thus representing an important contextual and feasibility criterion. Opportunity costs and forgone interventions were also acknowledged as important by a Canadian policy maker who also stated that "in practice, it is too difficult to measure." There are efforts and methods being developed to address the need to more explicitly consider opportunity costs such as Program Budgeting and Marginal Analysis (PBMA) (25).

A large proportion of the respondents currently consider organizational (82 percent) and skill (81 percent) requirements, two feasibility criteria that are also part of the Ontario Health Technology Advisory Committee (OHTAC) decision making framework (11). These feasibility criteria, as well as the clinical guideline criterion, figured among the top ten currently considered criteria. However, in terms of importance (weights), these three criteria scored relatively low (3.6–3.8 on a scale of 1–5) revealing that their impact on the final decision might be fairly small.

The innovativeness of an intervention ranked as the 29th criterion in terms of being currently considered. A New Zealand policy decision maker made a point in that "there is much pressure to reward innovation as an end in itself but they try to support innovative approaches only if they produce better value or outcomes." A policy maker from India indicated that they "support new technology that is economically feasible and sustainable." These comments suggest that innovation may not be a criterion to be considered per se but that the value of innovation might be captured by other criteria (e.g., improved outcomes).

Of interest, survey results suggest that decision makers wish to consider more criteria than they currently do. Environmental impact was the criterion with the greatest desired change because only 30 percent of decision makers reported considering it but 70 percent said they should ($p < .0001$). However, as commented by one respondent "the quality of consideration can at times be less than desirable due to an insufficiency of relevant data [on the environmental impact of an intervention]."

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The healthcare field will eventually need to promote environmentally friendly healthcare interventions to limit its impact on the environment and on the general health of the populations.

Stakeholder pressure/interest was the only criterion for which the proportion of respondents that reported that it "Should be considered" was less than that reporting that they "Currently consider" it, pointing to a level of discomfort with this criterion. Stakeholder pressure/interest plays a role in most decision making processes, a state of affairs that needs to be acknowledged to increase transparency and minimize, as much as possible, the risk and appearance of bias (26). African and Asian decision makers seem to be more likely to consider stakeholder pressures than decision makers from other world regions ($p = .0197$). It is possible that, in resource-limited settings, stakeholder pressures are more influential in the decision making process and affect the extent to which policies can be based on evidence (27).

This study should be considered in light of its limitations. The survey was conducted in English only, thus language barriers might have led to misinterpretation of some criteria descriptions. Although the sample size (140 respondents) was sufficient to provide a first global overview of decision makers' views, it was too limited to conduct more sophisticated analyses for comparing respondents with varying characteristics, such as across world regions (e.g., multivariate analysis). It is not known how representative the respondents were of the different levels of healthcare decision makers in their country or world region. Further studies are necessary to explore in more detail differences among decision makers with respect to the criteria considered across the healthcare decision continuum, between countries, and among decision makers with differing perspectives. Nevertheless, the sample size was sufficient to demonstrate the consistency and agreement among a large and diverse sample of decision makers on a set of core criteria.

This study points to a need for multicriteria approaches to help decision makers simultaneously consider all the criteria that they deem important and that are not currently integrated into cost-effectiveness based approaches (e.g., disease severity). Comprehensive frameworks, such as EVIDEM, which includes most of the top considered criteria identified in this survey, could be useful in supporting decision making processes at any level of decision. One policy decision maker from the UK commented: "when framed properly, then actually there is a great deal of consensus between clinicians, managers and patients and it is really not that difficult to decide what the priorities are" calling for "a new approach to examine these issues, radically different than what is currently being done."

Overall, survey findings were consistent with the literature, reinforcing the concept that many criteria are considered and are important in healthcare decision processes. There is strong consensus among decision makers on the relevance of a core set of criteria, including clinical efficacy/effectiveness, safety, quality of evidence, and criteria related to equity and fairness (e.g., disease severity), and cost implications. This suggests the possibility of developing a common road map incorporating core criteria and complemented by contextual criteria that would facilitate discussion and decisions across jurisdictions, levels of decision, and perspectives. Further research, such as real world case studies exploring criteria at all levels of decision (patients, clinicians, HTA, payer, regulators, developers), would generate detailed data on the criteria used in actual decisions and provide insight on how both within and across jurisdictions steps toward harmonization, where appropriate, may be made. Such a solid research basis will also make it possible to evaluate whether multicriteria processes in HTA and other levels of decisions provide a pragmatic mechanism to facilitate conversation and collaboration among stakeholders at all levels toward better health and sustainable, equitable and efficient healthcare systems around the world.

CONCLUSION

The results of this international survey among a diverse group of healthcare decision makers suggest the existence of a core set of shared decision criteria. This survey also revealed a widely perceived need to consider a greater range of criteria in healthcare decision making. Some areas of divergence were also uncovered, which appear to be principally related to contextual factors. These results suggest that multicriteria approaches that encompass all criteria of decision could provide powerful tools to support the ongoing reflection on improving patient health and resource allocation

SUPPLEMENTARY MATERIAL

Supplementary files can be found at: http://dx.doi.org/10.1017/S0266462313000573

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CONFLICTS OF INTEREST

All authors report they have no potential conflicts of interest.

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