1   **A. Title page**

2   **Title:** TOPIC SELECTION PROCESS IN HEALTH TECHNOLOGY ASSESSMENT

3   AGENCIES AROUND THE WORLD: A SYSTEMATIC REVIEW

4   **Running title:** How topics for HTA were selected around the world

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36   **B. Abstract**

37   **Objective:** The purpose of this study was to systematically review the process for topic

38   selection by health technology assessment (HTA) agencies around the world to provide

39   the knowledge base for improvement of topic selection frameworks in HTA agencies.

40   **Method:** A systematic search was conducted in PubMed and EMBASE to identify

41   papers up to February 2019. Grey literature was identified by screening the websites of

42   HTA agencies on the non-profit member list of International Network of Agencies for

43   Health Technology Assessment (INAHTA). Data were extracted for each HTA agency

44   and synthesized, with issues including general contextual information about each

45   agency and the process of topic selection.

46   **Results:** Out of forty nine non-profit members of INAHTA, a total of seventeen HTA

47   agencies with a framework for topic selection were identified from twenty two included

48   papers/documents. Multiple criteria were used for topic selection in all frameworks and

49   agencies undertook multiple steps, which could include specification of criteria for

50   topic selection, identification of topics, short listing of potential topics, scoping of

51   potential topics, scoring and ranking of potential topics, and deliberation and decision

52   on final topics for HTA. Shortcomings were found in relation to methods of scoring and

53   ranking as well as lack of monitoring and evaluation of the process.

54   **Conclusion:** Our study provides insights into the current practice of topic selection in

55   HTA agencies.Multiple criteria decision analysis (MCDA) methodology appears highly

56   relevant to these processes.A consensus approach for the development of methods

57   of topic selection would be valuable for the HTA community.

58   **Keywords :** Topic selection; Priority-setting; Health technology assessment;

59 **C. Acknowledgements and Sources of Funding**

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65 **D. Conflicts of Interest**

66 **Conflicts of Interest:** None

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70 **E. Text**

71 **Introduction**

72   Health technology assessment (HTA) is a useful priority setting tool to inform the

73 allocation of limited health resources (1; 2). The HTA process covers the definition of

74 the policy scope, prioritization of the technologies for assessment (which is also known

75 as topic selection), assessment and contextualization of findings to support decision

76 making (3) (4) (5).

77   The purpose of topic selection is to limit the number of topics that undergo a more

78 comprehensive assessment, thereby allocating the limited resources available to HTA

79 agencies in a more efficient way(3) (4). Topic selection is not just limited to a process

80 of deciding topics for assessment, but ideally involves multiple steps including

81 identification of possible technologies for assessment, prioritization and decision on the

82 possible assessments (6) (7) (8) .

83   To select relevant topics through a structured and explicit system is fundamental

84 for a good HTA process (9). The Priority Setting Subgroup of the EUR-ASSESS

85 project (6) has provided some recommendations on topic selection for HTA and

86 many European HTA agencies adopted the recommendations (10). However, the

87 practice of topic selection differs across HTA agencies.

88   In 2004, Garcia-Altes et al (11) compared HTA processes among agencies in

89 four different countries and found that there was a lack of explicit processes for topic

90 selection. In 2007, Noorani et al (2) reviewed twelve current priority-setting

91 frameworks in eleven HTA agencies and identified differences across HTA agencies

92 regarding the procedures used in topic selection, including categorizing, scoring, and

93 weighing of policy criteria. More recently in 2015, two reviews analyzed the criteria

94 used during topic selection across agencies and revealed differences between

95   organizations in the number and nature of the criteria used (2; 12), but did not

96   consider the whole topic selection process.

97   Furthermore, more detailed information on the topic selection process has now

98   been made available by many countries including Canada (13), United Kingdom (14),

99   Sweden (15) and Thailand (16), but this new information is yet to be analyzed and

100   compared systematically. Building on these previous studies, the purpose of this

101   study was to systematically review the published papers and grey literature on the

102   process for selecting HTA topics in different countries, to identify the steps involved,

103   and to provide the knowledge base for improvement of topic selection frameworks

104   in HTA agencies.

105   **Methods**

106   **Eligibility criteria**

107   Published papers and grey literature (e.g., documents, reports, process and method

108   guides from HTA agency websites) in English which covered information on the

109   process, pathway, framework, or method used to select topics within national or

110   regional HTA agencies were included. Only those that provided a complete description

111   of the whole selection process (i.e. from identification of potential topic to decision on

112   final topic) in each HTA framework were included.

113   Those that were not directly related to HTA topic selection (such as topic selection

114   for clinical research and horizon scanning, etc), merely mentioned identification of

115   topic without priority setting, just provided selection criteria without description of

116   other steps or only reported theoretical frameworks were excluded. Reviews and

117   conference abstracts were also excluded.

118   **Information sources and search strategy**

119   Based on three previously published systematic reviews on topic selection(1; 2;

120   12), search strategies were developed with keywords including 'health technology

121   assessment', 'priority setting', 'topic selection' and 'topic identification' then applied

122   in academic databases (PubMed and EMBASE) to identify relevant studies up to

123   February 2019. (Supplementary Appendix Table 1)

124   Grey literature was identified by screening forty nine websites of HTA agencies

125   from the non-profit member list of the International Network of Agencies for Health

126   Technology Assessment (INAHTA) using "topic selection", "priority setting",

127   "working process", "process guide" and "method guide" as keywords.

128   (Supplementary Appendix Table 2)

129   Reference and citation searching were performed on included studies to identify

130   other relevant articles. Additionally, bibliographies of the three related reviews (1) (2;

131   12) were checked manually for further potentially relevant publications.

132   **Selection process**

133   After duplication, citations were assessed for relevance on the basis of title and

134   abstract by two reviewers (YQ and YX). Citations that were considered relevant by at

135   least one reviewer were retrieved for further full text review. Eligible citations were

136   included after assessment against selection criteria by both reviewers (YQ and YX).

137   **Data collection and data items**

138   Data were extracted and synthesized by HTA agency. A template with three

139   sections was developed for data extraction and synthesis. Section one was a table for

140   extracting general context information about the agency, including name of agency,

141   country, and type of technology for topic selection. Section two was a table for

142   extracting information on steps of topic selection in each agency, which was developed

143   by a thematic analysis (17; 18) of reports from the HTA agencies that provided most

144   information about topic selection process. Section three was a table for extracting data

145   on criteria for topic selection and stakeholders involved in deliberation, which was

146   adapted from previous related reviews (1; 2; 12) (16).

147   Two reviewers (QY and YX) collected data independently from the reports using

148   the template for data extraction and synthesis. Missing data were marked as "not

149   mentioned" or "unclear". The two reviewers discussed the data after extraction and

150   disagreements were resolved through consensus. As the reports included in this review

151   were descriptive rather than quantitative, and because of the nature of the research

152   question, no formal assessment of the quality or bias of included items was undertaken.

153   The reporting of this review conforms with the PRISMA 2020 statement (19)

154   (Supplementary Appendix Tables 3-5 for results of data extraction).

155   **Results**

156   **Selected literature**

157   As shown in the PRISMA diagram (Figure 1), after deduplication and exclusion of

158   non-English articles and sifting based on the titles, forty five articles remained from

159   788 potentially relevant articles yielded in PubMed and EMBASE. After examining

160   abstracts, twenty seven articles were excluded (twenty five irrelevant papers and two

161   reviews) and full texts of remaining eighteen articles were retrieved and assessed for

162   eligibility. After exclusion for limited information on the process of topic selection (n=9)

163   and repeated content (n=1) and the addition of one article identified by manual

164   screening of three reviews, nine published(13-16; 20)(21-23) (24) articles were selected

165   for inclusion. In terms of grey literature, forty nine websites of HTA agencies were

166   screened and twenty four potentially relevant resources were identified. After exclusion

167   of two non-English documents and nine documents with insufficient details,

168   thirteen(25-34)(35; 36)were selected for inclusion. As such, a total of twenty two

169   papers/documents were included for analysis. (see Supplementary Appendix Tables 6-

170   8 for information of reports excluded)

Overview of HTA agencies identified

172   Seventeen HTA agencies from fifteen countries were identified from twenty two

173   included papers/documents (Table 1). There were four from Asia including ACE

174   (Singapore) (34), HITAP(Thailand)(16; 37), HTAD(Kazakhstan)(22) and

175   MaHTAS(Malaysia) (35); eight from Europe including HIQA (Ireland)(31), HTW

176   (Wales, United Kingdom)(30) , ICHTA(Israel)(23), IQWiG(Germany) (24; 29), KCE

177   (Belgium)(33), MRU(Lithuania)(21), NICE (England, United Kingdom)(14; 26),

178   SBU(Sweden)(15; 28) and ZonMW(Netherlands)(20; 27); and there were four from

179   North America including AHRQ(United States)(36), CADTH(Canada)(13; 25), HQO

180   (Canada)(32) and ICER (United States)(38).

Process of topic selection

182   Reports of CADTH (Canada) and SBU (Sweden), which provided the most

183   comprehensive descriptions of the topic selection process, were reviewed thoroughly

184   by both reviewers (YQ and YX) to identify the steps of topic selection. The key steps

185   within CADTH and SBU were summarized by two reviewers independently, and a draft

186   template of common steps along with their definitions were produced after discussion.

187   These were piloted on other agencies and revised until saturation of information was

188   reached (17). At which point the final template with six steps was produced (Table 2).

189   Not all six steps were included or described in detail in all frameworks (Table 3).

190   The steps of criteria for topic selection, topic identification, and deliberation and

191   decision on final topic for HTA were included in the framework of all HTA agencies.

192   However, the other three stages (short listing of potential topics, scoping of potential

193   topics, and scoring and ranking of potential topics) were not always included. There

194   were nine frameworks (CADTH, NICE, IQWiG, ZonMW, SBU, HTW, KCE, ACE and

195   MaHTAS) which applied short listing to screen the potential topics; twelve frameworks

196   (CADTH, HITAP, NICE, IQWiG, SBU, HTW, HIQA, HQO, KCE, ACE, MaHTAS and

197   AHRQ) included a scoping step; and eleven frameworks (MRU ,CADTH, HITAP ,

198   ZonMW, HTAD, SBU, HIQA, HQO, KCE, ACE, MaHTAS and AHRQ) used a

199   quantitative method to score and rank potential topics before deliberation.

200   The six steps were not always applied sequentially in all frameworks. For example,

201   IQWiG processed scoping of potential topics before short listing. KCE and HQO scored

202   and ranked potential topics before short listing. Also, these steps were not always

203   performed exclusively i.e. some frameworks included multiple steps that were

204   performed together. For example, in four frameworks (MRU, HITAP, HTAD and SBU),

205   potential topics were scored and ranked during the deliberative meeting used for

206   deciding the final topic list for HTA. The practices and approaches adopted in each

207   stage across frameworks were also different, which are described in detail in the next

208   sub-sections.

209   **Specification of criteria for topic selection**

210   All frameworks described the criteria for topic selection. Out of the six

211   frameworks with detailed descriptions of criteria selection, two (CADTH and MRU)

212   identified criteria based on their own systematic reviews while the other four (HITAP,

213   ZonMW, MaHTAS and HTAD) referred to published systematic reviews or related

214   papers. Multiple criteria were used for topic selection in all frameworks. The three most

215   common criteria used by agencies were burden of disease (n=13), clinical/health impact

216   (n=12) and economic impact (n=12).

217   Five frameworks developed weights for their chosen criteria for use in subsequent

218   scoring and ranking. Delphi or expert consultation was used to select and weight criteria

219   in 4 frameworks (MRU, ZonMW, HITAP and HTAD) and analytic hierarchy process

220   (AHP) was applied in CADTH.

221   Identification of topics

222   In general, topics were (a) identified through horizon scanning by HTA agencies,

223   (b) requested directly by policy makers or an expert panel /committee, (c) submitted by

224   academic researchers, and (d) nominated by the general public online. The sources of

225   topic identification varied between agencies. For example, CADTH and NICE

226   identified from sources (a), (b) and (d) mentioned above, while HIQA only received

227   topics requested by policy makers.

228   Only five published papers reported the number of potential candidate topics

229   processed, with these showing a wide range in numbers across agencies: CADTH

230   (n=102 in 3 years), MRU(n=26), HTAD (n=41), NICE (n=109 for the Interventional

231   Procedures Programme) and ICHTA (n=over 100).

232   Shortlisting of potential topics

233   Nine agencies (CADTH, NICE, IQWiG, ZonMW, SBU, HTW, KCE, ACE and

234   MaHTAS) selected a short list of topics for further evaluation. Two types of short listing

235   were identified.

236   The first type was to check the eligibility only. NICE, SBU, HTW, KCE, ACE and

237   MaHTAS applied explicit criteria of eligibility to filter potential topics. These criteria

238   are different from those used for prioritization of the short-listed topics. Duplication of

239   topic and the remit of program were the most commonly used criteria.

240   The second type was to cut the number of potential topics using predefined criteria.

241   In CADTH topics are scored and ranked against duplication of effort, need and stage

242   of diffusion. ZonMW scored proposals against policy relevance and selected those with

243   intermediate or high policy relevance for further scientific quality assessment.

244   In IQWiG, a selection committee nominated fifteen topics from a master list for

245   further priority setting and in SBU, a short list was produced by the SBU Board after

246   internal and external scanning of fields of interest. However, little information on

247   criteria used in short listing was reported by either IQWiG and SBU.

248   **Scoping of potential topics**

249   Different terms were used to describe this stage, including 'scoping'(CADTH),

250   'pre-scoping'(NICE), 'topic processing' (IQWiG), "pilot study" (SBU), "exploratory

251   study"(HTW) and "preliminary research" (MaHTAS).

252   In this stage, research questions were clarified and defined by contacting

253   nominators or consulting experts if applicable. Evidence collection and processing was

254   an important component at this stage, which was used for scoring (if applicable) and

255   deliberation.

256   The amount and complexity of the work undertaken at this stage varied substantially

257   between agencies. For example, HITAP, and AHRQ mapped information in topic

258   proposals against selection criteria then collected further data in order to capture

259   important missed information. While, IQWiG, CADTH, NICE, SBU, MaHTAS and

260   ACE simply referenced the conduct of bespoke literature reviews.

261   **Scoring and ranking of potential topics**

262   In this stage, scoring was used to measure the performance or preference against

263   selection criteria (to be combined with weights to build up the overall value).

264   Nine frameworks mentioned scoring and ranking potential topics against selection

265   criteria (CADTH, HTAD, HQO, HITAP, KCE, ACE, ZonMW and MaHTA). Referring

266   to evidence against each criterion generated in scoping, proposed topics were scored

267   and ranked either by researchers of agencies (CADTH, ZonMW, IHQA and ACE) or

268   an expert panel/committee (MRU, HITAP, HTAD, SBU, HQO, KCE and MaHTAS).

269 Direct rating techniques were used most commonly. CADTH, HTAD, HQO, HITAP,

270 ZonMW and KCE used a rating scale to score against each criterion. While ACE and

271 MaHTA allocated points to each criterion. MUR provide little information about the

272 technique of scoring.

273 Weighted sum model was widely used. CADTH, MRU, ZonMW and MaHTAS

274 applied different weighting across criteria to calculate total score, while the others

275 assumed equal weights (HITAP and HTAD) or did not mention weighting (HQO,KCE

276 and ACE). Ranking based on total scores was used to show the overall preference of

277 potential topic. Only ZonMW used different weighting algorithms to explore the

278 uncertainty of weighting on total score. SBU and HIQA did not mention scoring, which

279 implies that ranking was an output of a deliberative process.

280 **Deliberation and decision on final topics for HTA**

281 In this step, an advisory body discussed the information collected on potential topics

282 and advised or made a decision on final topics for HTA. Advisory bodies could include

283 a) an internal executive board of HTA agency, b) an internal working team of topic

284 selection in HTA agency, or most commonly c) a special expert committee/panel set up

285 for topic selection. The composition of the advisory bodies included a wide range of

286 representatives, including policy makers, health professionals, academics, patients,

287 civil society. Only five frameworks (HITAP, IQWiG, ZonMw, KCE and MaHTAS) had

288 patient representatives and no framework reported having representatives from the

289 biotechnology industry or the general public.

290 Contents and details of evidence used during deliberation were also different among

291 agencies. MRU mainly relied on expert opinions. HITAP, HTAD, ZonMW, ICHTA and

292 AHRQ mainly referred to information in proposals provided by nominators. IQWiG,

293 CADTH, NICE, SBU, MaHTAS, and ACE referred to evidence based on original rapid

294   reviews or additional pilot research. The ranks of potential topics were also provided

295   or generated during deliberation in eleven agencies.

296   After the deliberation, a final list of topics for HTA were produced. However, the

297   final result did not always agree with the ranks of potential topics. For example, in

298   HITAP, nine out of thirteen potential topics were selected for HTA, of which eight were

299   selected for best ranks. Interestingly, some agencies used this stage to triage topics to

300   different forms of HTA. For example, MaHTAS highlighted that different types of HTA,

301   including full HTA, mini-HTA or evidence briefing, were recommended depending on

302   sufficiency of evidence. CADTH mentioned rejected topics being recycled or dealt with

303   through less-extensive HTA methods following deliberation.

304   **Discussion**

305   Our study presents a comprehensive review of the topic selection process in HTA

306   agencies around the world. Seventeen HTA agencies were identified with all of them

307   using multiple criteria to evaluate topics. A framework for topic selection was outlined

308   including six steps: specification of criteria for topic selection, topic identification,

309   short listing of potential topics, scoping of potential topics, scoring and ranking of

310   potential topics, and deliberation and decision on final topic for HTA. However, not all

311   of these six steps were always included or described in detail in all frameworks. Our

312   review, which provides detailed information on the practical process of topic selection

313   in HTA agencies, is broader than similar previous studies which focused on criteria for

314   topic selection (1) (12) or decision-making on final topics (2).

315   Our review confirmed the diversity of practice observed by Noorani et al (2). In

316   particular, we found the number and type of criteria for topic selection varied between

317   agencies and the six steps were not always used nor applied in a consistent manner.

318   Even for the same step, actors, stakeholders and methods were not the same. This

319 variability may be interpreted as reflecting differences in health priority, mandates and

320 administration of programs, resources and capacity in different contexts (6). However,

321 some of this variation could also indicate uncertainty relating to the best approach to

322 take, which in turn raises the possibility that some of the adopted approaches are flawed.

323 In general, we found that agencies in countries with well-established HTA systems (e.g.

324 CADTH, SBU and NICE) conducted topic selection processes more systematically.

325   Multiple criteria were used in all frameworks, however, the approaches used to

326 select criteria were not always explicit. The most commonly used criteria identified in

327 our review were burden of disease, economic impact and clinical/health impact, which

328 are similar to the findings in the two previous reviews(1) (12). However, the number

329 and nature of criteria varied in different frameworks in our review, similar to previous

330 studies (1; 12). These differences are likely to reflect policy and cultural differences,

331 however, this cannot be ascertained as agencies seldom described how they selected

332 their criteria for topic selection.

333   For a systematic approach to identifying topics, horizon scanning might be useful,

334 which is aimed at identifying new and emerging health technologies that may have a

335 relevant impact on the health system (39). However, only CADTH and NICE used

336 formal horizon scanning systems to recognize possible technologies for assessment.

337 (40). Also, short listing of topics might be needed when the list of potential topics is

338 long. In these circumstances, agencies can use short listing to reduce the workload of

339 evidence collection and to obtain a manageable number of technologies for deliberation.

340 Scoping of topics can also be used to assess the feasibility for a full HTA. Agencies

341 such as NICE, HTW and MaHTAS removed some technologies from the topic selection

342 process based on stakeholder consultation and/or the nature of the evidence gathered

343 during the scoping process.

344   In terms of the overall framework for topic selection, a common pattern was observed

345   across agencies in our review which was in contrast with the findings from previous

346   studies. Garcia-Altes et al (11), after comparison of four HTA agencies across Europe

347   in 2004, found that organizations generally lacked explicit processes for prioritization

348   for HTA . Noorani et al (2) suggested there was not any particular pattern that emerged

349   when comparing 12 HTA programs in 2007. However, we found that most agencies

350   practiced Multiple Criteria Decision Analysis (MCDA) in either a qualitative or

351   quantitative way (41). This may reflect the developments in HTA across the world

352   over the last decade(42) (43) (44), which could be supported by the change of topic

353   selection process in Canada (45) and Netherlands (46).

354   Also, in contrast to the results produced by Noorani (2), we found scoring and

355   ranking were more commonly used to measure the relative priority of potential topics

356   (11 out of 17 frameworks). These quantitative approaches tend to encourage

357   participation and reflection as well as strengthening the level of transparency and

358   accountability of the process (47), which may explain their widespread use among

359   agencies. However, limitations were found in the methods used for scoring and ranking.

360   First, equal weight or no weighting across criteria were noted in most agencies, which

361   may ignore the different preferences between criteria. Second, the most prevalent

362   model adopted for score aggregation is the additive model which is analytically simple

363   but requires that the criteria do not overlap and are preferentially independent (48).

364   Third, uncertainty is not fully explored, yet issues such as choice of technique for

365   scoring and aggregation, as well as heterogeneity in preferences may contribute to the

366   uncertainty of the results (49) (50).

367   We found no information in relation to monitoring and evaluation of the processes

368   identified. Monitoring and evaluation is a critical link to control quality and develop a

369 robust and consistent system of topic selection(6). It seems likely that this occurs, albeit

370 informally, in at least some of the agencies above as evidenced by the methods being

371 updated. However, this information will only be captured through comprehensive

372 engagement with each agency.

373 Involvement of patients or patient representatives in deliberation were not common

374 among agencies. Involvement of patients may strengthen transparency, legitimacy and

375 fairness in decision making(51; 52), but the nature of patient participation was difficult

376 to assess from the materials reviewed. Patients can contribute experiential knowledge

377 about the technology under assessment, currently available technologies and other

378 valuable information (53), which may support deliberation. However, organizational

379 and recruitment challenges maybe hinder HTA agencies from getting patient

380 involvement in topic selection. Abelson (54) found key organizational challenges

381 relating to the involvement of patients in HTA included time, financial resources and

382 expertise required to communication with the patients. Difficulty in getting a 'good

383 representative' is another important recruitment obstacle (54). Additionally, as topic

384 selection is across many diseases/conditions, it is difficult to expect a single 'patient

385 representative' to provide insights on all topics.

386 There are limitations to our study. First, more databases could have been searched

387 and websites of HTA agencies that are not members of INAHTA could have been

388 searched. However, our study aimed to provide an overview of current practice of

389 topic selection for HTA across agencies rather than reviewing the processes of all HTA

390 agencies. Second, publication bias may exist in this study. The descriptions were

391 restricted to the published articles and documents in English within the webpages of

392 the INAHTA members, which may not describe the current processes

393   comprehensively. Ideally, our description of each agency's process would be validated

394   by each agency and could have been supplemented by interviews or observation.

395   We believe the development of a good practice checklist for a topic selection process

396   would help improve the quality of such processes since no guidelines exist specifically

397   for topic selection as opposed to to other aspects of HTA (3). The nature of topic

398   selection for HTA seems ideally suited for MCDA, which includes defining the decision

399   problem and identifying options, structuring criteria, collecting evidence and measuring

400   performance, scoring and ranking (if applicable), then decision making (47) (49).

401   Recent systematic reviews (50) (55) on application of MCDA in healthcare show its

402   potential to support transparent, consistency and rigorous decision making in healthcare,

403   therefore, it would appear worthwhile exploring the potential of using MCDA good

404   practices to support the development of a checklist for topic selection.

405   **Conclusions**

406   Our study provides insights into current methods of topic selection and the variability

407   of practice across HTA agencies. Several weaknesses were identified with the most

408   important relating to the methods of scoring and ranking as well as lack of

409   monitoring/evaluation of the process. The topic selection process has many parallels

410   with MCDA and so a more rigorous adoption of MCDA methods could be useful for

411   improving current topic selection processes. These findings may be useful for

412   developing a consensus approach for good practice on topic selection.

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414   **F.**

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G. Table page

Table 1 General information of HTA agencies and literature included in analysis

Name of agency	Region	Country	Level	Type of technology for assessment	Record included (date of publication)
ACE (Agency for Care Effectiveness)	Asia	Singapore	National	Drugs, devices, diagnostic test and medical services	1 grey document (34)(2018)
HITAP (Health Intervention and Technology Assessment Program)	Asia	Thailand	National	Drug, medical devices, procedures, public health intervention and health policy	1 published paper(16)(2012);
HTAD (Health Technology Assessment Department of Ministry of Health, Kazakhstan)	Asia	Kazakhstan	National	High specialized technologies	1 published paper (22)(2016)
MaHTAS (The Malaysian Health Technology Assessment Section)	Asia	Malaysia	National	Drugs, devices, diagnostics, procedure	1 grey document (35)(2018)
HIQA (Health Information and Quality Authority)	Europe	Ireland	National	Drugs, devices, procedures, public health interventions, support system, organizational features	1 grey document (31)(2016)
HTW (Health Technology Wales)	Europe	Wales, United Kingdom	Regional	devices, procedures, psychological therapies, tele-monitoring or rehabilitation	1 grey document (30)(2019)
ICHTA (Israeli Center of HTA in health care)	Europe	Israel	National	Drugs, devices and procedures	1 published paper (23)(2000)
IQWiG (The Institute for Quality and Efficiency in Health Care)	Europe	Germany	National	Medical examination and treatment methods^	1 grey document (29) (2017); 1 published paper (24) (2021)
KCE (Belgian Health Care Knowledge Center)	Europe	Belgium	National	Medical technology, a drug or a vaccine	1 grey document (33)(2019)
MRU (Mykolas Romeris University)	Europe	Lithuania	National	Drugs, procedures, public health intervention;	1 published paper(21) (2013)
NICE (National Institute for Health and care Excellence)	Europe	England, United Kingdom	National	Drug, device, medical procedures, diagnostic health system*	1 published paper(14) (2014); 1 grey document(26) (2019)
SBU (Swedish Agency for Health Technology Assessment and Assessment of Social Services)	Europe	Sweden	National	Drugs and medical technologies	1 published paper (15)(2004); 1 grey document(28)(2018)
ZonMW (The Netherlands Organization for Health Research and Development)	Europe	Netherlands	National	Therapeutic interventions; diagnostics; preventive procedures	1 published paper (20) (2002); 1 grey document(27) (2012)
AHRQ (Agency for Healthcare Research and Quality)	North America	United States	National	Drugs, devices, medical tests, and mechanisms of health care delivery	1 grey document (36)(2019)
CADTH (Canadian Agency for Drugs and Technologies in Health)	North America	Canada	National	Drugs, diagnostic tests, devices and procedures	1 published paper(13) (2010); 1 grey document(25) (2015)
HQO (Health Quality Ontario)	North America	Canada	Regional	Medical devices, medical tests, surgical procedures, health care programs, and complex health system interventions	1 grey document (32)(2018)
ICER (Institute for Clinical and Economic Review)	North America	United State	National	drugs or other health care interventions	1 grey document (38) (2018)

* for Technology Appraisal Program and Medical Technologies Evaluation program ^ for HTA report program

Table 2: Description of 6 steps of topic selection

Step	Description of content
Specification of Criteria for topic selection	Criteria for topic selection were identified, defined and weighted (if applicable).
Identification of topics	Potential topics were identified from different sources then pooled into a proposed topic pool/list. Sources included organizational or individual proposers or more systematically via horizon scanning methods.
Short listing of potential topics	Potential topics can be explicitly checked for eligibility against remits of agency or program, or predefined inclusion and exclusion criteria then resulting into a shorter list.
Scoping of potential topics	In order to make potential topics ready for ranking (if applicable) and final deliberation, research questions of potential topics were structured; proposals of potential topics were processed according to criteria of topic selection; additional evidence were collected if applicable.
Scoring and ranking of potential topics	If applicable, potential topics were scored and ranked against selection criteria based on evidence collected.
Deliberation and decision making on final topics for HTA	Potential topics were prioritized based on various type of evidence and selected for HTA by stakeholders and final decision or recommendation on final topic for HTA were made.

Table 3 Checklist of 6 stages of topic selection

HTA agency @	Specification of criteria for topic Selection	Identification of topics	Short listing of potential topics	Scoping of potential topics	Scoring & ranking of potential topics	Deliberation and decision on final topics for HTA
ACE	#	*	*	*	*	*
HITAP	*	*	NA	*	*	*
HTAD	*	*	NM	NM	*	*
MaHTAS	*	*	*	*	*	*
HIQA	#	*	NM	*	*	*
HTW	#	*	*	*	NA	*
ICHTA	#	*	NM	NM	NA	*
IQWiG	*	*	*	*	NA	*
KCE	#	*	*	*	*	*
MRU	*	*	NA	NA	*	*
NICE	#	*	*	*	NA	*
SBU	*	*	*	*	*	*
ZonMW	*	*	*	NM	*	*
AHRQ	#	*	NM	*	NA	*
CADTH	*	*	*	*	*	*
HQO	#	*	NM	*	*	*
ICER	#	*	NM	NM	NA	*

@:ACE (Agency for Care Effectiveness); HITAP (Health Intervention and Technology Assessment Program); HTAD (Health Technology Assessment Department of Ministry of Health, Kazakhstan); MaHTAS (The Malaysian Health Technology Assessment Section); HIQA (Health Information and Quality Authority); HTW (Health Technology Wales); ICHTA (Israeli Center of HTA in health care); IQWiG (The Institute for Quality and Efficiency in Health Care); KCE (Belgian Health Care Knowledge Center); MRU (Mykolas Romeris University); NICE (National Institute for Health and care Excellence); SBU (Swedish Agency for Health Technology Assessment and Assessment of Social Services); ZonMW (The Netherlands Organization for Health Research and Development); AHRQ (Agency for Healthcare Research and Quality); CADTH (Canadian Agency for Drugs and Technologies in Health); HQO (Health Quality Ontario); ICER (Institute for Clinical and Economic Review)

*:step were described in sufficient details;

 #: only definition of criteria for topic selection without description of the development process;

 NM: stage was not mentioned in reports;

NA: stage were not applicable in the framework.

H. Figure captions

Figure 1 PRISMA diagram
*INAHTA International Network of Agencies for Health Technology Assessment