Health Policy 123 (2019) 1288–1297

Contents lists available at ScienceDirect

Health Policy

journal homepage: www.elsevier.com/locate/healthpol

# The Dutch chaos case: A scoping review of knowledge and decision support tools available to clinicians in the Netherlands

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ARTICLE INFO

*Article history:*
Received 14 May 2019
Received in revised form 2 October 2019
Accepted 4 October 2019

*Keywords:*
Guidelines
Tools
Knowledge
(Shared) decision-making
Definitions
Review

ABSTRACT

*Background:* To keep clinicians up-to-date with the latest evidence, clinical practice and patient preferences, more and more knowledge tools – aiming to synthesise knowledge and support (shared) decision-making – are being developed. Unfortunately, it seems that in the Netherlands, and possibly elsewhere, the amount of different knowledge tool types makes it difficult to see the forest through the trees.

*Methods:* A scoping review, exploring types of knowledge tools available to Dutch clinicians (and patients) and how these tools are described. The search terms were collected from thesauri and textbooks, and used to search the websites and documents of selected national tool developing organisations.

*Results:* The review yielded 126 tool types. We included 67 different tool types, such as guidelines, protocols, standards and clinical pathways. Half of those tool types were aimed at clinicians, 14 at patients and 18 at both. In general, descriptions of the tool types were hard to find or incomplete.

*Conclusions:* There exists a myriad of knowledge tool types and their descriptions are mostly unclear. The information overload experienced by clinicians is not addressed effectively by developing numerous unclearly defined knowledge tools. We recommend limiting the number of tool types and making a greater effort in clearly defining them. This abundance of poorly defined tools does not seem to be restricted to the Netherlands.



## 1. Background

Doctors have been signalling for years that they feel overburdened by information [1–3] and that they are suffering from 'infobesity' [4]. Sackett indicated more than 20 years ago that it is impossible for doctors to stay abreast of the developments in their field [5]. The already vast knowledge in health care is expanding daily – in 2010, 11 systematic reviews were published every day [6] – so that keeping up with developments is a challenge [7,8]. The development of so-called knowledge tools is intended to support clinicians (and patients) to keep pace and to improve their decision-making [9,10]. In addition to knowledge tool types such as evidence-based clinical practice guidelines (CPG), however, protocols, guidance, standards, clinical pathways and many other tool types have been developed over the years. With the rising importance of shared decision-making [11] and the increasing call for a patient revolution [12], further tool types have been added to the mix, including decision aids, question prompt lists and option grids [13,14].

Is the image of the clinician bogged down in information being replaced with one of the clinician bogged down in a myriad of knowledge tools [15]? This image is probably not exclusive to the Netherlands, as there appears to be a' widespread view [. . .] that work effectiveness is impaired by information overload' [1,2].

*Abbreviations:* DCGP, Dutch College of General Practitioners; IVM, Institute of Responsible Medicine Use; Ge-Bu, Drug Bulletin Foundation; NKP, Network of Clinical Pathways; IGJ, Dutch Health and Youth Care Inspectorate; WHO, World Health Organization; IHTSDO, International Health Terminology Standards Development Organisation; LOINC, Logical Observation, Identifiers, Names and Codes; AIWH, Australian Institute of Health and Welfare; NIH, National Institutes of Health; AHRQ, Agency for Healthcare Research and Quality; CIHR, Canadian Institutes of Health Research; NHS, National Health Service; NICE, The National Institute for Health and Care Excellence; ÄZQ, Ärztliches Zentrum für Qualität in der Medizin; DECIDE, Developing and Evaluating Communication strategies to support Informed Decisions and practice based on Evidence; EU, European Union.

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https://doi.org/10.1016/j.healthpol.2019.10.001
0168-8510/

Moreover, even though tool types such as CPGs, standards, pathways and decision aids are used in other countries as well [16–22], are all these tools really different in terms of content and purpose [9,23]?

Research into knowledge and decision support tools has been conducted within several countries. Such research, however, seems to focus on one tool type, for example clinical pathways [24–26], CPGs or patient decision aids [23,27,28]. Research into clinical pathways yielded an overview of 84 similar tools adorned with different names. Another focus in this research was the use, methodology of development [29] and implementation [30] of these tools. To our knowledge, no overview exists at a national level of current knowledge and decision support tool types used by clinicians or patients.

The objective of this review article is to identify the different types of knowledge and decision support tools which are available at a national level to clinicians and patients in the Netherlands and to gain insight in how these tool types are described or defined. We looked at it from a national policy perspective, concentrating on tool types developed by national organisations. For reasons of feasibility, we focused on Dutch national organisations that develop and implement these tools. A scoping review identifies the range and nature of existing knowledge tools by summarising what is there and might reveal if something is missing. The review therefore also serves as a basis for conducting further research and defining relevant research questions related to tools, knowledge use and translation.

## 2. Methods

### 2.1. General design

This study is a descriptive scoping review of knowledge tool types developed by Dutch national healthcare organisations that support clinicians or patients with knowledge transfer and shared decision-making. The general purpose for conducting scoping reviews is to identify and map the available evidence, in this case tool types. Arksey & O'Malley, and Levac et al, also described several reasons why scoping reviews are conducted. We chose this kind of review because we wanted to examine the amount and range of available tool types, and gain insight into the provided definitions [31,32].

### 2.2. Data sources

The websites, documents and links to other sources on the websites of purposive sampled Dutch healthcare organisations known to develop and disseminate knowledge tools were used as data sources. Organisations that solely fund or research such tools were excluded. Because of the multitude of organisations in the Netherlands developing and disseminating knowledge tools, the authors selected seventeen of them: three medical specialists' associations, two allied healthcare organisations, five guideline agencies, one umbrella organisation for professionals, five government agencies and one umbrella organisation for patients (see Appendix A in Supplementary material).

### 2.3. Inclusion criteria for the tool types

Included in this review were those tool types which are being developed and made available by Dutch nationwide non-commercial healthcare organisations; are related to care content; for which an evidence-based approach was followed; which are intended for knowledge transfer and decision support; are publicly accessible and which concern cure and/or palliative care (Fig. 1).

We used the following definition of a tool: a tool distils, synthesizes and interprets the highest quality knowledge and research to serve knowledge translation and support (shared) decision-making [33]. Related, secondary tools that are based on these primary tools, with the main purpose to educate and/or implement were, albeit contributing to knowledge translation, excluded.

### 2.4. Identification, selection of tool types and data extraction

A scan of the selected organisations was undertaken to reveal which search terms to use in order to identify knowledge tools (see Appendix B in Supplementary material). These terms were then processed through two thesauri [34,35] to find synonyms and related terms. The list of terms was entered into the search engines on the websites of the organisations. If a website did not support searches for compound terms (for example, 'evidence table'), the yield of hits for the separate search terms was checked for their combination. In cases of various spellings for the same term, e.g. 'shared decision-making' and 'shared decision making', both spellings were used. If a website did not provide a search engine, the terms were searched on the webpages by the first author with the help of the web browser search function and by manual inspection.

An iterative approach was used when searching these websites. The hits were checked for relevant descriptions and information by the first author. The information was copied and pasted into a crude data file, including web address and the time and date of the search. When there were more than 100 hits, only the first 100 were checked. In cases where the hits redirected to other websites (see Appendix A in Supplementary material) these links were followed, as were links to reports and articles ('snowballing' method). When reports or publications were unavailable on the website, the organisation was contacted in order to obtain a copy of the report or article. If it could not provide the document, it was obtained through the National Library of the Netherlands. In the case of unclear or unavailable descriptions, Google was used to find more information on the term in combination with the organisation. If Google yielded no or insufficient information, the organisation was contacted by email to ask for the missing information. If no clarification could be provided by email, a phone call or physical appointment was undertaken to retrieve the missing information. Both the emails and the notes of the telephone conversations were added to the crude data file. If the email or follow-up was not successful after two attempts, the researchers limited themselves to the available data from the tools.

### 2.5. Data analysis

Statements describing or defining the knowledge tool types formed our primary interest. Each tool type found was entered into a table together with the full or partial descriptions identified per data source. All the tools identified were subsequently scored along the inclusion criteria (see Fig. 1) by the first author. To decide if a tool type had followed an evidence-based approach we checked if it was developed in a transparent and systematic way, and searched and synthesized evidence according to the rules of evidence-based practice [36].

The scoring by the first author was verified by the authors TvdW and LK, by systematically scoring every tenth tool listed, with TvdW starting from 5 and LK from 10 (so rows 5, 15, 25, 35, etc. and rows 10, 20, 30, etc.). When scores varied, we discussed these until we reached consensus on the scoring. The first author then entered the final scores for all tools.

The tool types preliminarily included were copied into a new crude data table. Information received from additional searches and inquiries with the organisations were added to this table. On the basis of the additional information, we made a decision on final

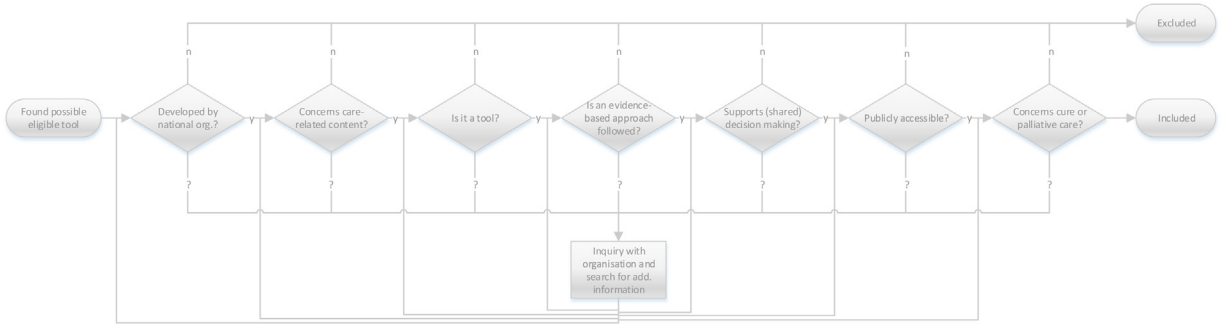


**Fig. 1.** Inclusion flow chart for the final tool selection.

inclusion. The final table was structured by organisation to provide insight into the number of organisations in the Netherlands active in developing and disseminating knowledge tools, and the different names of the tools assigned. The tool types were described according to the following characteristics, if available, extracted from the data sources:

- Definition or description of tool is available on the website;
- Target group of knowledge tool:
  - Patients, healthcare professionals, both, or others such as policy advisors, government and insurers?
  - If targeted at healthcare professionals, mono- or multidisciplinary?
- Development process:
  - Patient or public involved?
  - Authorisation process described or mentioned?
- Publicly accessible?

The aim was to characterise the tool as generic or specific – generic means that the tool can be used or reused for different care subjects and is developed by various organisations; specific means that the tool is limited in its options for use or reuse by others or is developed by one organisation only. As this proved difficult to indicate in a table, we decided to reflect on the characteristics of these tools in the running text.

Again, the co-authors verified the subset of the data extraction. They each selected at least 15 tools at random and checked the scoring. In case of disagreement, we discussed the extraction until we reached consensus. The first author then entered the final scores for all tools.

## 3. Results

The search yielded 126 tool types, of which we included 67 in the review.

### 3.1. Data sources

We started by searching the websites of the 17 selected organisations. During this search, 10 additional organisations were found via snowballing; three of those organisations that met the selection criteria of the purposive sampled organisations were added to the search and their websites were subsequently searched.

### 3.2. Identification, selection of tools and data extraction

The search started with 48 search terms. During the search, which took place from September 2012 to April 2013, we added six related terms (marked with an asterisk in Appendix B in Supplementary material). Hits were listed numerically per organisation, together with the source and description if available. This led to a list containing 126 tools. Hits which appeared to represent a tool were tentatively put on the list. Descriptions of the tools were either limited or not always available on the websites. Additional inquiries with the organisations, data sources and Google search were used to fill the gaps, but sometimes information remained unknown. After applying the inclusion criteria of the flow chart, 74 tools remained. However, seven of these were considered synonymous and were removed, leaving 67 tool types (Fig. 2). The inclusion reliability and data extraction verification by the co-authors did not lead to any discrepancies.

This lack of information, even after additional searches and inquires meant that it was not always possible to extract the tools' characteristics. Information on characteristics such as authorisation and patient or public involvement were the most difficult to determine.

Sometimes the organisations only mentioned the name of the tool and offered little or no description. In several cases, the information was retrieved by looking at documents on the website or in hard-copy papers obtained from the organisation itself. Moreover, not all tools were accessible via the Internet; some were only available to organisation members or upon payment. In this case, we attempted to obtain a demo version which might yield a description of the tool. Most organisations that we contacted were willing to offer additional information and made demos of their tools available free of charge. These demos, however, did not always yield descriptions either. Some organisations did not describe the tool on their website, while others offered more than one description. On several websites compound terms were mentioned but only the simple term was explained; for instance, the website of the Federation of Medical Specialists only explains the term 'guideline' but does not explain the term 'multidisciplinary guideline'. What is meant by 'multidisciplinary' is left to the reader: more than two disciplines of medical specialists, other healthcare professionals, or even other parties such as insurers, providers and patients?

As mentioned above, the characteristic of public or patient involvement during tool development was difficult to determine. This was apparent in 28 descriptions of tool types, of which five mentioned explicitly that there was no patient or public involvement, and for 34 tools this could not be ascertained. These figures were almost the same as those for the characteristic 'authorized' or 'legitimatised' by the organisation(s) involved in the development of the tool: 26 tools were authorised, three were not, and for 38 tools this could not be determined. Four tools were deemed limited accessible; these were difficult to find online at the time of the review.

Of the 67 tool types/names, 33 appeared to refer to unique tool types. 'Patient translation of guideline' and 'patient version of guideline' were considered similar terms, just as 'multidisciplinary', 'network' and 'practice guideline' were considered to be similar to the 'plain' 'guideline'. To show the abundance of names given to the tool types and possible differences in data extraction, we trans-

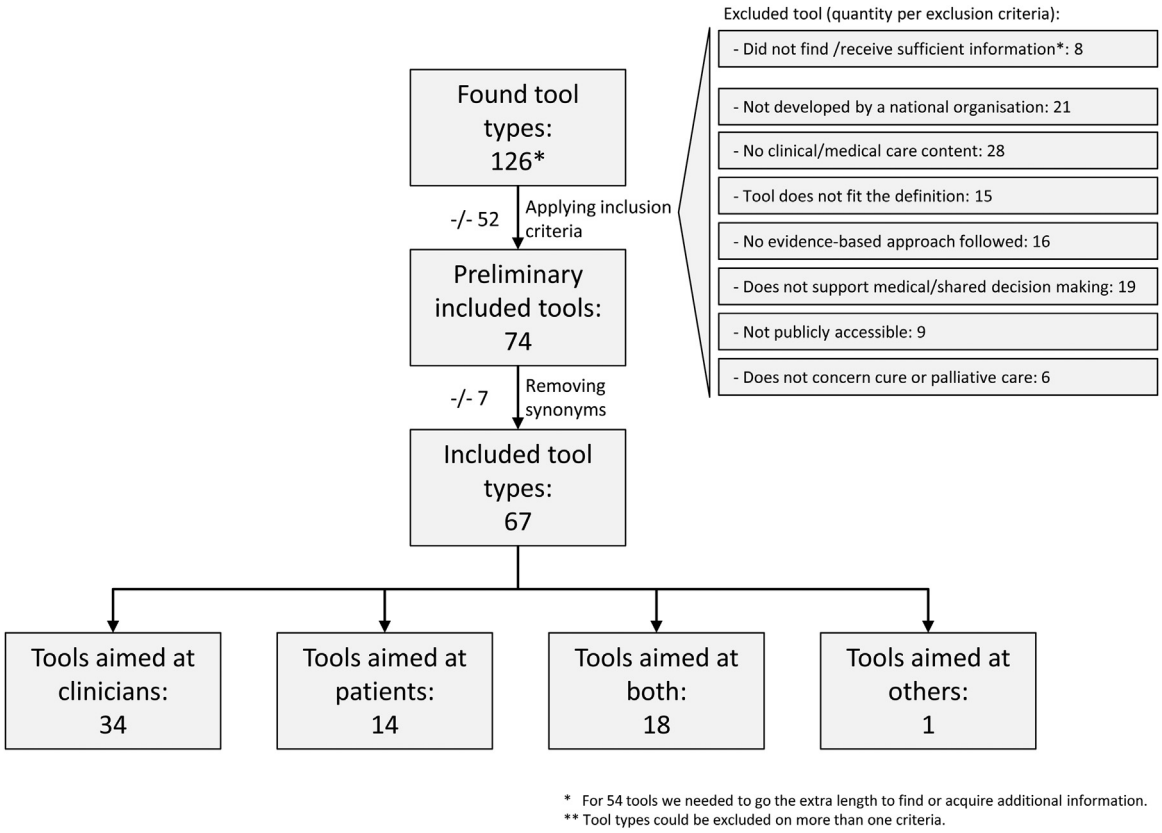


**Fig. 2.** Tool types found.

ported all included tools to the final table for data extraction (see Table 1) describing their characteristics.

### 3.3. Target users and interrelatedness of tools

Despite the increased attention for patient engagement in decision-making and tools enabling this, it appeared that most tool types (n = 34) were primarily aimed at healthcare professionals; 14 were aimed solely at patients; and 18 at both. One tool type was targeted at a different user group: helping employers deal with employees who have health problems. Six tool types also mentioned other target users, such as governments and healthcare insurers.

Flow charts, summaries and patient versions of CPGs are generally regarded as derivatives of guidelines [37]. We consider decision aids and CPGs to be linked as well, since patient decision aids are mostly based, or should be based on CPGs [38]. The criteria of Option Grids™ even required these to be based on clinical practice guidelines (personal communication K. Venhorst). However, interpretations differ among organisations and expected links are missing. For instance, the Netherlands Society of Occupational Medicine (NVAB) and the Royal Dutch Society for Physical Therapy do not regard flow charts and guideline summaries as knowledge tools in themselves – to be used independently from the guideline – but as an integral part of the guideline. By contrast, the Nurses Association does regard a summary (sheet) of the guideline as a tool that can be used independently. Patient versions of guidelines were mostly viewed as tools to be used independently. With other tools, however, links were expected, as they cover the same subject and are probably based on the same knowledge. For example, CPGs and patient decision aids developed by the Dutch Institute for Healthcare Improvement were not always developed in concordance with each other, as the CPG for a specific subject was updated but the corresponding decision aid was not. Fig. 3 provides a rendering of how different tool types in our view could be (inter)connected or related to each other.

## 4. Discussion

The aim of the review was to assess the number of knowledge tool types available to clinicians or patients, by identifying the existing national-level tools that support knowledge translation and shared decision-making. We included 67 tools published by 20 organisations. So, does the real-life situation correspond to the picture of chaos painted in the introduction, with doctors bogged down in a myriad of tools? Notwithstanding the fact that the review only included tools from a limited number of national organisations that develop and disseminate knowledge tools, we suggest that the answer is yes. There is an abundance of tool types available and the definitions of these tools are mostly vague or incomplete. This made it difficult to assess whether these tools differ in terms of content or purpose.

Moreover, there are even more knowledge tools available than we could include. For example, tool types such as ‘process guideline’ and ‘modular guidelines’ were gaining momentum at the time of the review but were excluded. Based on the name, we decided that the tool type ‘process guideline’ would probably address care processes and not care content. After inquiry, ‘modular guidelines’ seemed to refer more to the development process of clinical practice guidelines, and it was therefore excluded. Moreover, we also disregarded tools developed at regional and local levels, just as tools in the domain of long-term care. Also excluded were tools developed at an international level [14,39], which were not yet mainstream in the Netherlands at the time of the review, and tools from (more) commercial organisations such as pharmaceutical companies. This means that there are even more tool types

**Table 1**
Included tool types, and tool characteristics.

| | | | Characteristics | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Target User Groups | | | Development & Dissemination | | |
| | Organisation | Tool type | Definition / description available | Clinician, patient or both | Mono- or multidisciplinary | Other (e.g. policy advisors or insurers) | Patient/public involvement | Authorization / legitimatisation | Accessibility |
| 1 | Royal Dutch | Decision tree/flow chart | ×[a] | c[d] | mo[g] | ×[k] | ?[m] | √[p] | ≈[s] |
| 2 | Society for Physical Therapy | Evidence statement | √[b] | c | mo | × | ? | √ | ≈ |
| 3 | | National primary care cooperation agreement | √ | c | mo | × | ? | √ | √[t] |
| 4 | | Multidisciplinary guideline | √ | c | mu[h] | × | √[n] | √ | √ |
| 5 | | Patient version of the guideline | √ | p[e] | n/a[i] | × | √ | ?[q] | √ |
| 6 | | Practice guideline | ≈[c] | c | mo | × | √ | √ | √ |
| 7 | | Standard | ≈ | c | mo | × | ? | √ | √ |
| 8 | Dutch College of | Pharmacotherapeutic guideline | ≈ | c | b[j] | × | ? | ? | √ |
| 9 | General | Information brochure (for the clinician) | ≈ | c | n/a | × | √ | √ | √ |
| 10 | Practitioners | Multidisciplinary guideline | × | b[f] | mu | × | √ | ? | √ |
| 11 | (DCGP) | Network guideline | × | b | mu | × | √ | ? | √ |
| 12 | | Patient letter | × | p | n/a | × | ? | ? | √ |
| 13 | | DCGP standard | × | c | mo | × | ? | √ | √ |
| 14 | | Viewpoint | × | c | mo | × | ×[o] | ? | √ |
| 15 | | 'Thuisarts.nl (Homedoctor.nl)' | ≈ | p | n/a | × | ? | ? | √ |
| 16 | | Clinical description | × | p | n/a | × | ? | ? | √ |
| 17 | Netherlands | Blueprint | √ | c | mu | × | ? | √ | √ |
| 18 | Society of | Patient translation of the guideline | ≈ | p | n/a | × | ? | ? | √ |
| 19 | Occupational | Guideline | √ | b | b | × | √ | √ | √ |
| 20 | Medicine | Viewpoint | ≈ | c | mo | × | × | √ | √ |
| 21 | | Employer version | × | n/a | n/a | × | ? | ? | √ |
| 22 | | Employee version | × | p | n/a | × | ? | ? | √ |
| 23 | Dutch Paediatric | Clinical guideline | √ | b | b | × | ? | √ | √ |
| 24 | Association | Viewpoint | √ | c | mo | × | ? | ? | √ |
| 25 | Dutch Nurses | Information folder | × | p | n/a | × | ? | ? | √ |
| 26 | Association | Quick reference guide/summary (sheet) | × | c | mo | × | ? | ? | √ |
| 27 | | Guideline | √ | b | b | × | ? | √ | √ |
| 28 | Dutch Institute for | Indicator | ≈ | b | b | √[l] | √ | √ | √ |
| 29 | Healthcare | Patient decision aid | √ | p | n/a | × | ? | ? | √ |
| 30 | Improvement | Patient version | √ | p | n/a | × | ? | ? | √ |
| 31 | | Guideline | √ | c | b | × | √ | ? | √ |
| 32 | | Guidance | ≈ | b | mu | √ | √ | √ | √ |
| 33 | Quality Institute | Decision disk | √ | c | b | × | ? | ? | √ |
| 34 | for Oncological | Helping hand | √ | c | mo | × | ? | ? | √ |
| 35 | and Palliative | Integral oncological care path | ≈ | c | mu | × | ? | ? | √ |
| 36 | Research and | Patient folder | √ | p | n/a | × | ? | ? | √ |
| 37 | Practice | Guideline | ≈ | b | b | × | √ | √ | √ |
| 38 | | Compounded information on side effects | √ | b | b | × | ? | ? | √ |
| 39 | Federation of | Information brochure (for the clinician) | √ | c | n/a | × | √ | √ | √ |
| 40 | Medical | Guiding principle | ≈ | c | mu | × | ? | √ | √ |
| 41 | Specialists | Guideline | √ | b | b | × | ? | √ | √ |
| 42 | TNO research | Guideline | ≈ | c | b | × | √ | ? | √ |
| 43 | organisation | Standard | × | c | b | × | √ | ? | √ |
| 44 | Trimbos Institute | Patient decision aid | ≈ | p | n/a | × | √ | ? | √ |
| 45 | of Mental Health | Multidisciplinary guideline | √ | c | mu | × | ? | ? | √ |

Table 1 (*Continued*)

| | | | Characteristics | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Target User Groups | | | Development & Dissemination | | |
| | Organisation | Tool type | Definition / description available | Clinician, patient or both | Mono- or multidisciplinary | Other (e.g. policy advisors or insurers) | Patient/public involvement | Authorization / legitimatisation | Accessibility |
| 46 | Royal Dutch | Helping hand | ≈ | c | mu | × | ? | ? | √ |
| 47 | Medical Association | Guideline | ≈ | c | mu | √ | √ | ? | √ |
| 48 | Dutch Patient | Patient brochure | ≈ | p | n/a | × | √ | ? | √ |
| 49 | Organisations' | Patient version | ≈ | p | n/a | × | √ | ? | √ |
| 50 | Federation | Guideline | ≈ | c | b | × | √ | ? | √ |
| 51 | | Care standard | ≈ | b | mu | √ | √ | ? | √ |
| 52 | National Health | Decision tree | √ | c | mo | × | ? | ? | √ |
| 53 | Care Institute | Pharmaceutical compass | ≈ | c | mu | × | × | × | √ |
| 54 | | Quality / professional standard | ≈ | b | b | √ | √ | √ | √ |
| 55 | | (indication) protocol | √ | c | mo | × | ? | ? | √ |
| 56 | | Guideline | × | b | b | √ | √ | √ | √ |
| 57 | | Care standard | × | b | mu | √ | √ | √ | √ |
| 58 | Health Council of the | Guideline | √ | b | mu | × | ? | √ | √ |
| 59 | Netherlands | Occupational health benefit insurance protocol | √ | c | mo | × | ? | √ | √ |
| 60 | Choosing-better.nl | Decision aid | ≈ | p | n/a | × | √ | ? | √ |
| 61 | | Guideline | ≈ | c | b | × | √ | ? | √ |
| 62 | Health and Youth Care Inspectorate | Field norm | × | b | b | × | √ | ? | ≈ |
| 63 | IVM[u] | Medicine Balance sheet | √ | c | mu | × | × | × | √ |
| 64 | Coordination Platform for Care | Care module | ≈ | b | mu | √ | √ | √ | √ |
| 65 | Standards | Care standard | √ | b | mu | √ | √ | √ | √ |
| 66 | Ge-Bu[v] | 'GeneesmiddelenBulletin (Drug Bulletin)' | ~~×~~ | c | mu | × | × | ×[r] | √ |
| 67 | NKP[w] | Clinical pathway | √ | c | mu | × | ? | ? | ≈ |

Definition/description of tool type available on website? No (×[a]), yes (√[b]), incomplete (≈[c]).
Tool type targeted at which group? Clinician/healthcare professional (c[d]), patient (p[e]) or both (b[f]).
Monodisciplinary (mo[g]), multidisciplinary (mu[h]) tool, both (b*j*) or not applicable (n/a [i]).
Tool types also mentions other target groups? No (×[k]), yes (√[l]).
Mentioning of patient and/or public involvement in developing the instrument? Yes (√[n]), No (×[o]), unclear (?[m]).
Authorization or legitimatization process mentioned? Yes (√[p]), no (×[r]), unclear (?[q]).
Publicly accessible? Limited (≈[s]), yes (√[t]).
Abbreviations: IVM[u]: Institute of Responsible Medicine Use (Instituut Verantwoord Geneesmiddelengebruik); Ge-Bu[v]: Drug Bulletin Foundation (Stichting Geneesmiddelen Bulletin); NKP[w]: Network of Clinical Pathways (Netwerk Klinische Paden).

available to clinicians and patients than we mentioned in this article, and we doubt if these are all clearly defined.

As a number of definitions were incomplete, data extraction was more difficult than we had anticipated. Textbooks [40–42], which were consulted to determine search terms, seemed more conscientious about the terms they used than the websites. The books mostly contained definitions or descriptions, but these were sometimes in contradiction with the terms found on the websites. One could argue that the gap identified between the textbooks and the websites perhaps mirrors the gap between theory and practice [40].

Most tools were primarily aimed at healthcare professionals. This could be due to the leeway of patient involvement in this area and in developing these tools to catch up. There are other users of these tools, such as the Dutch Health Care Inspectorate and healthcare insurers. These are, however, not considered to be target groups; that is, they are not mentioned in the descriptions of the majority of the tools. This might reflect the opinion of some developers in the Netherlands that these groups use the tools for other purposes then the ones for which they are intended, e.g. contracting healthcare services or enforcement. These are considered inappropriate uses, which lead to friction between these parties [43]. In one of the discussions among the authors, the question surfaced whether information on target users should be part of the definition. What is the hallmark of a good definition and what needs to be included in the definition to describe a tool clearly?

An interesting question related to the digital age is whether anything is ever lost or forgotten nowadays. Even though tool types and tools become obsolete or their content becomes outdated, they can often still be found on the Internet (or on PCs). This could mean that tools no longer in use are never completely forgotten, clogging up the already bulging pipeline of tool types. Another aspect of the digital age is that the tool and its medium are becoming increasingly interlinked and inseparable; apps on smartphones are a powerful example [44,45]. Tools are nowadays readily available in different forms and on different media. Looking to the (near) future, we see a digital age with an abundance of access possibilities via apps, social media and the internet, with' [u]nlimited information on limited human bandwidth.' [46].

One could raise the question whether it is chaos we are looking at, or evolution. Like organisms, tools come into existence and gradually evolve into different 'species'. In time, some become extinct, while the ones that fit best survive. Alternatively, one could put

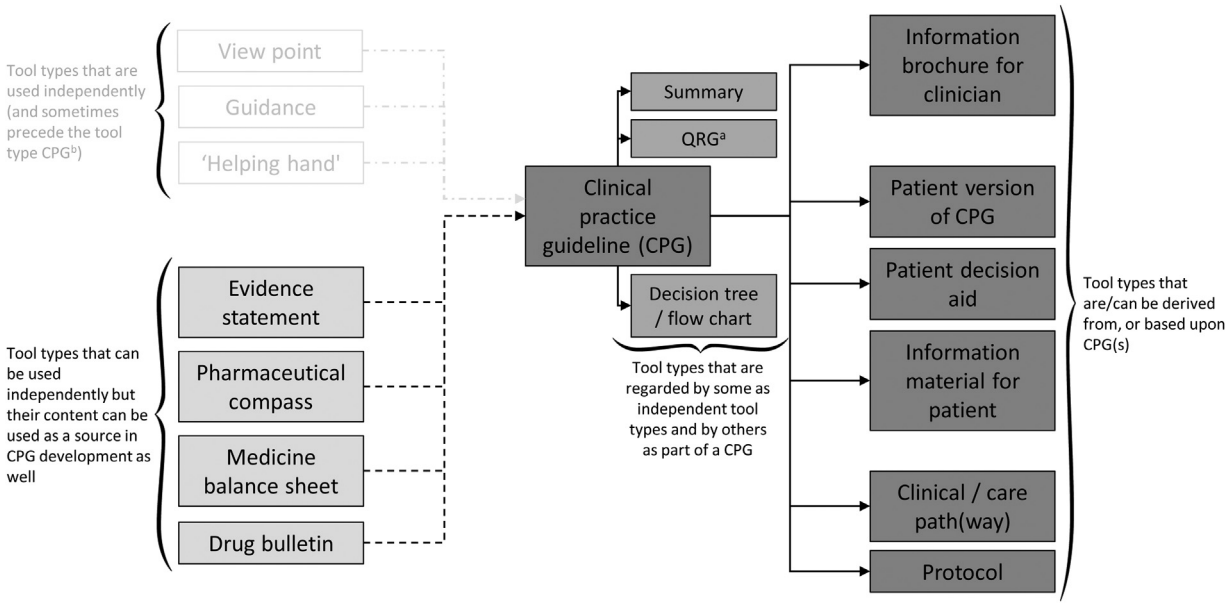


**Fig. 3.** A rendering of how tool types could be (inter)connected or related to each other. a QRG: quick reference guide. b CPG: clinical practice guideline.

it into more economic terms, as the Dutch healthcare system has undergone a shift from government regulated to a market regulated construct. As a result, organisations apply strategies of differentiation and diversification to advance themselves and to try to distinguish their products from those of other organisations [47]. The National Health Care Institute recently introduced the 'care tree' tool [48]. This is in effect a digital flow chart, but such a name would not attract the attention desired by the institute [49]. The DCGP (Dutch College of General Practitioners) already applied this marketing technique a long time ago by calling its guidelines 'standards'. This implies that when their guidelines are developed according to their strict, predetermined criteria, they are entitled to be called 'standards'. Consequently, DCGP Standard could be considered the 'brand name' for their guidelines.

As mentioned above, the description of a tool was not always immediately clear. This does not necessarily mean that there is no understanding of the tools within or outside the organisation. For example, the DCPG Standards have already been in use for almost thirty years. The DCPG Standard and its meaning might therefore be considered to be common knowledge in healthcare practice.

The tool types of the Dutch Health and Youth Care Inspectorate (IGJ) proved to be an ambiguous case. The Inspectorate mentioned seven tool types on its site but no definitions were provided. In general, the Inspectorate refers to these tool types as 'field norms', as they are preferably developed by the healthcare field. One of the tasks of the Health Care Inspectorate is monitoring; when it detects an inadequacy, it will call upon the relevant healthcare organisation(s) to address this problem, for example by developing a tool. A clear explanation of these tools would therefore have been expected; in failing to provide these, the expectations of the Inspectorate remain unclear. Some parties, including the Health and Youth Care Inspectorate itself, might say that in this manner it grants organisations room to manoeuvre and decide for themselves which tool is appropriate. At the same time, the Inspectorate fosters expectations of the tool in question and its use for monitoring and enforcement, which congruent with the purposes of the healthcare organisations developing the tool, and whether this organisation employs a clear definition of the tool or not. We decided to include the general term 'field norm' as it can refer to all tool types developed and used by healthcare organisations.

The example mentioned above underlines the importance of clear and precise definitions of tools. Norma Lang phrased it boldly in 1992: 'If we cannot name it, we cannot control it, practice it, teach it, finance it, or put in into practice' [50,51–53]. Another reason for this might be that health care is multidisciplinary, although the real meaning of 'multidisciplinary' seems to become apparent and sink in only now. Apart from different kinds of healthcare professionals, patients are added to the healthcare equation, while insurers, government agencies are also (getting) involved [54,55]. Maybe these do not all play a pivotal role in the decision-making process between patient and clinician, but they do use the tools. To better understand each other it is therefore necessary to use and speak the same language [56]. As Ubel states in his book *Critical decisions*:' For any pair of people to communicate effectively, it helps enormously if they share a common language.' [57]. At the moment, we appear to speak a common language regarding knowledge tools in the Netherlands, using terms that sound and look alike. However, because these terms are not always defined explicitly, we do not always attach the same meaning to them or use them in the same way, and we get lost in translation.

We have not yet even looked beyond the national borders, even though increasing cooperation between clinicians and patients from different countries [58–60] means additional languages, additional tools and terms, and additional meanings. Some recognise the need to have a common language within and outside the knowledge domain. In 2012, an international study group explored the notion of developing a common terminology for knowledge translation interventions. The rationale for doing this was that 'a wide range of diverse and inconsistent terminology exists in the field of knowledge translation. This limits the conduct of evidence syntheses, impedes communication and collaboration, and undermines knowledge translation.' [61]. At an even more fundamental level, organisations have started to work together towards a shared terminology. An international consortium consisting of WHO (ICD10), IHTSDO (SNOMED CT) and LOINC, worried about the confusion of tongues regarding data collection in (health) care for the use of research and policy development, worked out a framework describing core concepts using concise process descriptions [62].

Is the chaos restricted to the Netherlands? A search on foreign websites and PubMed yielded no information or articles on chaos regarding knowledge tools. At the same time, no overviews

or frameworks of tool types – which state definitions and possible links between them –were found either for other countries. Glossaries, definitions, A to Z's, jargon busters and taxonomies found (search took place in April 2013) on the websites of e.g. AIWH (Australia), NIH, Informed Medical Decisions Foundation, AHRQ (US), CIHR (Canada), NHS, NICE (UK), ÄZQ (Germany), Cochrane Collaboration, EU and WHO mainly dealt with words and terms related to medicine/health (adverse event, condition), epidemiology (absolute risk), research (abstract), quality (patient safety terms) and organisation of care domains (advocacy) [63–77]. The document that came closest to an explanation of tool types was found on the AHRQ website and concerned a collaboration between Russia and the United States, dating from 1999. It listed under the heading 'Quality standards' terms such as 'practice guidelines', 'clinical path', 'critical path', 'standard' and 'quality standard' [78].

Our suspicion that the chaos case was not limited solely to the Netherlands was confirmed when we presented the preliminary results of the review at the Guidelines International (GIN) Conference [79] and International Shared Decision Making (ISDM) Conference [80]. The conclusion that there are too many tools was endorsed, together with the notion that the links between the tools are often lost. The DECIDE project (Developing and Evaluating Communication strategies to support Informed Decisions and practice based on Evidence) – funded by the European Union – has tried to address these issues, by increasing the accessibility and use of tools such as clinical practice guidelines, linking interconnected tools such as decision aids in a more visible way and updating them [81].

The website of the European Union makes it clear that health care is not the only area struggling with definition issues:' It is not possible to use one definition to cover all circumstances. Similarly, the word 'standards' is employed in a variety of ways across Europe [. . .]. The words also have very different meanings in the local contexts of national higher education systems.' [77]

### 4.1. Strengths and limitations

Because we made the choice to include tools even though their definition or description was not fully complete –incompleteness was deemed an interesting result by itself – it could mean that somebody else might decide differently on the inclusion or exclusion of the tools that we found. The aim of the review was to show that there were many tool types available in the Netherlands for knowledge transfer and decision-making. Although another person might have chosen different organisations or different tools, we feel that the outcome would have been roughly the same. Because of the national policy perspective, we limited the scoping review to tool types being developed by national agencies. Including locally developed, internationally developed tool types and tool types developed by commercial organisations probably would have generated an even larger range of available tool types, but we would not have been able to look into these tool types in detail as we did in this approach.

## 5. Conclusions

In the Netherlands, but also in countries, there is a myriad of tool types available to healthcare professionals (and patients). Tools that are developed to facilitate, ensure knowledge translation, and to provide healthcare professionals with support whilst making decisions. But because the tool types are not defined clearly and precise, misunderstanding about their use and purpose can arise. As can miscomprehension between disciplines and domains. We also might be duplicating efforts, and wasting (public) means when developing these tool types. Also, because the dependencies or interconnectedness between some of the tool types is poorly indicated as well. And we still add new ones before we have established that the old ones do not work. By doing so, we seem to be creating, despite our best intentions, a tool overload instead of solving the information overload.

### 5.1. Recommendations

As existing tool types do not seem to deliver the results for which they are intended or do not live up to the full expectations of their target users, one response is to develop new ones [48,82]. We should ask, however, if this is the right response, or whether we need to take a closer look at the tools already available and how they are being used, need adaptation, as well as paying attention to improving (in providing) the definition of these tool types and their intended use.

We have shown that there exists a myriad of tool types, most of which are poorly defined and unclear as well as to their mutual relations. This abundance of tool types might affect their usefulness raising the important question how to deal with all these tools, their different formats and sometimes their contradictory contents. The review underpins what parties have been advocating for a number of years now [23]: a trimming down of the number of tool types or terms used and a clear(er) definition of tools. We recommend that parties on either a national or preferably an international level try, first, to reach agreement on a core set of knowledge tools; second, to reach consensus on the definitions and terms used for these tools; and third, to develop a conceptual framework showing the relations between the tools. This tool issue seems to be an exemplification of the tenet that 'less is more'. However, as we did not systematically invest Dutch clinicians' and/or patients' views on this issue, we would recommend that follow-up research is carried out to find out if Dutch healthcare professionals and patients are aware of the multitude of tool types, how they perceive this availability and how they deal with it.

Another paper features our report on a Delphi process intended to reach a consensus on the number of tool types and their definitions at a national level in the Netherlands. This Delphi process (2015) was followed by an invitational meeting with international experts (2016) aiming to develop a framework of related knowledge tools, their purposes and characteristics [83].

## Funding

Maastricht University.

## Ethics approval and consent to participate

Not applicable.

## Consent for publication

Not applicable.

## Availability of data and material

All data processed or analysed during the study are included in this published article. Crude data (in Dutch) are available from the corresponding author on reasonable request.

## CRediT authorship contribution statement

**Dunja Dreesens:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - original draft, Writing - review & editing, Visualization, Project

administration. **Leontien Kremer:** Conceptualization, Methodology, Validation, Formal analysis, Writing - review & editing. **Trudy van der Weijden:** Conceptualization, Methodology, Validation, Formal analysis, Writing - review & editing, Supervision, Funding acquisition.

## Declaration of Competing Interest

None.

## Acknowledgements

We would like to thank Günter Ollenschläger for his useful comments on an earlier version of the article.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.healthpol.2019.10.001.

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