

Perspective: Consideration of Values When Setting Priorities in Nutrition Research: Guidance for Transparency

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ABSTRACT

Nutrition research can guide interventions to tackle the burden of diet-related diseases. Setting priorities in nutrition research, however, requires the engagement of various stakeholders with diverse insights. Consideration of what matters most in research from a scientific, social, and ethical perspective is therefore not an automatic process. Systematic ways to explicitly define and consider relevant values are largely lacking. Here, we review existing nutrition research priority-setting exercises, analyze how values are reported, and provide guidance for transparent consideration of values while setting priorities in nutrition research. Of the 27 ($n = 22$ peer-reviewed manuscripts and 5 grey literature documents) studies reviewed, 40.7% used a combination of different methods, 59.3% described the represented stakeholders, and 49.1% reported on follow-up activities. All priority-setting exercises were led by research groups based in high-income countries. Via an iterative qualitative content analysis, reported values were identified ($n = 22$ manuscripts). Three clusters of values (i.e., those related to impact, feasibility, and accountability) were identified. These values were organized in a tool to help those involved in setting research priorities systematically consider and report values. The tool was finalized through an online consultation with 7 international stakeholders. The value-oriented tool for priority setting in nutrition research identifies and presents values that are already implicitly and explicitly represented in priority-setting exercises. It provides guidance to enable explicit deliberation on research priorities from an ethical perspective. In addition, it can serve as a reporting tool to document how value-laden choices are made during priority setting and help foster the accountability of stakeholders involved. *Adv Nutr* 2018;9:671–687.

Keywords: nutrition, priority setting, values, guidance, tool, ethics

Introduction

Poor diets are the leading risk factor for ill health and mortality worldwide (1). Nutrition epidemiology examines associations between diet and health, and informs actions to improve population well-being and health. Research

prioritization is key to make targeted choices, optimize the global investment, and accelerate progress in nutrition research in general. Research priority setting is a formal procedure of generating consensus about a set of research questions that are considered when guiding resource allocation (2). There is no golden standard to prioritize research. Many comprehensive approaches to health research prioritization exist and provide structured as well as flexible options for stakeholders to reach consensus (3).

Transparency about values that underlie this process is key (4). Values are “the things and events in life that people desire, aim at, wish for, or demand” (5). A proper and systematic consideration of values during the process of a priority-setting exercise has the potential to improve the quality of research by enhancing relevance, uptake, and societal impact (6, 7). Stakeholders involved in the process come with their own values and interests (8). Reflections on whose interests are served are relevant for readers and they enhance transparency and accountability.

Perspective articles allow authors to take a position on a topic of current major importance or controversy in the field of nutrition. As such, these articles could include statements based on author opinions or point of view. Opinions expressed in Perspective articles are those of the author and are not attributable to the funder(s) or the sponsor(s) or the publisher, Editor, or Editorial Board of *Advances in Nutrition*. Individuals with different positions of the topic of a Perspective are invited to submit their comments in the form of a Perspectives article or in a Letter to the Editor.

Supported by a scholarship from the Schlumberger Foundation's Faculty for the Future Program (www.ftff.slb.com) (to DH).

Author disclosures: CL, WP, and PK are coauthors of one of the priority-setting exercises: *Developing a sustainable nutrition research agenda in sub-Saharan Africa—findings from the SUNRAY project*. *PLoS Med* 2014;11(1):e1001593. DH's funding had no role in the conduct of this study or in the content of this article. NAB and RV, no conflicts of interest.

Supplemental Table 3 as MS word table is available from the “Supplementary data” link in the online posting of the article, and from the same link in the online table of contents at <https://academic.oup.com/advances/>.

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Like other biomedical sciences, nutrition research needs to consider how research waste can be avoided and value can be added (9). Considerable efforts have already been made to enhance downstream aspects of the research value chain, in particular the quality of research conduct (10) and the reporting of findings (11). The development of upstream processes, however, has received less attention. In particular, the governance of research via the development of practical tools to improve priority setting needs attention (9).

Scholars have called for an explicit value framework to assist stakeholders when setting health research priorities (2). Current ethical frameworks for priority setting (2, 12–14) often predefine values. However, the choice of these values is not justified explicitly and current frameworks are generally theoretic, without consideration of practical implementation (6).

Here, we provide guidance for the consideration of values for future priority-setting exercises in nutrition research. We present a tool to enable explicit reflection and transparency on values for future priority-setting exercises. The tool aims to be inclusive and builds on what is currently reported in the literature. Although it is developed for nutrition research, we consider it equally useful to other types of research that rely on broad stakeholder involvement. As a working definition, we define values as general descriptions of an interest, or of what matters (e.g., “honesty”), that are not formulated in a measurable way (which we would define as a norm, e.g., “don’t lie”).

Methodology

A 3-step approach was used to develop the guidance tool: 1) a mapping review of nutrition priority-setting exercises summarized the main characteristics of the existing research priority-setting exercises and reported values, 2) values reported in the manuscripts of the mapping review were identified via qualitative content analysis and organized in a tool, and 3) the tool was submitted for comments and feedback during a consultation round with the authors of the priority-setting exercises.

Step 1: mapping review of nutrition priority-setting exercises

The output of a mapping review that systematically identified priority-setting exercises (e.g., in research, policy, and implementation science) in the nutrition field was used for the present study. The detailed review protocol is available elsewhere (15). In summary, 5 online databases were screened including Medline (8 July 2017), ISI Web of Knowledge, Cochrane Library, and Turning Research Into Practice (TRIP) (20 July 2016), and Excerpta Medica database (EMBASE) (30 August 2016). The initial syntax was developed in Medline with the use of the PICO (population, intervention, control, and outcomes) model (15). The developed search syntax included MeSH terms as well as free words in the title and abstract. It included the following terms (Delphi OR “Delphi technique” [MeSH]

OR “Consensus” [MeSH] OR “voting” [all fields] OR priorities OR priority OR prioritisation OR prioritization OR “priority setting” OR setting priority OR setting priorities OR agenda) AND (“Diet, food and nutrition” [MeSH] OR nutrition OR dietary OR obese OR malnutrition OR nutrition disorders [field: Title/Abstract]). For the other databases, the search terms were adapted and modified, and included both text words and thesaurus terms. Grey literature documents were obtained through the use of the grey literature database Grey Literature Report (<http://www.greylit.org>), and targeted websites [Scaling Up Nutrition (SUN): www.scalingupnutrition.org; Thousand days: www.thousanddays.org; Council on Health Research for Development (COHRED): www.cohred.org; the Child Health and Nutrition Research Initiative (CHNRI): International Food Policy Research Institute (IFPRI): www.ifpri.org/search?keyword=priorities; and USDA Interagency Committee on Human Nutrition: www.fnrc.nal.usda.gov/surveys-reports-and-research/interagency-committee-human-nutrition-research] were searched. Moreover, external experts were consulted to identify further relevant websites and papers.

Title and abstract screening was performed for the databases’ results independently by 2 researchers (DH and RV) against the eligibility criteria, and a third researcher (AB, see Acknowledgments) was consulted in case of disagreement. Screening resulted in 133 eligible abstracts. The full report of the mapping review will be presented elsewhere. The grey literature search resulted in 9 documents and the experts’ consultation resulted in 2 papers.

As the present study focuses on nutrition research specifically, the eligible abstracts resulting from the mapping review were screened with “research” as an additional inclusion criterion as per protocol. DH screened the titles and abstracts again to identify papers focused on research. Of these manuscripts, 42 were read in full by DH and CL. Finally, 22 papers were excluded based on the exclusion criteria: 9 papers were not focused on nutrition, 5 were not research priorities, 4 papers had not used a formal priority-setting method, 2 were not in English, and 2 were only abstracts without a full text available. Nine grey literature documents were read in full, of which 4 were excluded (no explicit priority-setting method used). Two papers were added through expert consultation. The first was published after the search date in December 2016 (16). The second was not retrieved by search syntax, but was added for its relevance and importance in moving the research agenda (17). Disagreement was resolved by discussion. A third researcher (PK) was consulted in case of doubt. Data extraction of the study characteristics was performed by DH and included: the objective, methodology used, target population, number of experts involved, and funding sources. The country of affiliation of the first author was used as a proxy to determine where the priority setting was set. Owing to data saturation during qualitative data analysis, grey literature papers were not included in the qualitative analysis.

Step 2: guidance tool development

To extract values considered when setting nutrition research priorities, retrieved papers were analyzed qualitatively (18) with the use of NVivo Pro 11 (QSR International, Melbourne, Australia). Building on qualitative analysis, we have developed our own strategy of extracting values. Values were defined as general description of an interest/what matters through discussion guided by practices in medical ethics. The focus of the value is in general a nonmeasurable term in contrast to norms, which render values “measurable.” Moreover, a value during the analysis was seen as an action focused on achieving a sole purpose (i.e., an end) and not as an action carried out to achieve something further (i.e., means to an end). For example, “education” as a value is considered a means to achieve a higher quality of living. Hence, “quality of life” instead of “education” was considered as a value during the analysis.

As a first step, a preliminary set of values was extracted by 4 reviewers independently (CL, WP, DH, and NAB) using 3 randomly selected articles of the review. Second, the set of values was applied to a new set of 5 randomly selected articles, and the preliminary list of values was evaluated and revised until a consistent node list was reached. Finally, 2 researchers (DH and NAB) coded all the papers independently, including the 8 papers used in developing the preliminary list of values. The 2 researchers then discussed differences in coding until they reached a common agreement. To ensure correct coding, a medical ethicist (WP) trained DH and NAB on how to identify values. In addition, WP assisted in the structuring of the node trees, and provided advice in case of doubt. Finally, WP also performed sample checks to safeguard the accuracy of the coding.

During data comparison, similarities in the values found were resolved and the values were organized into higher categories and concepts via an iterative process. The list was simplified, i.e., passages that considered means to an end as a value were excluded. After this process of conceptualization and exclusion, the tool and list of values were further modified and simplified through frequent discussions between the reviewers (CL, WP, DH, and NAB) from March to September 2017 until consensus was reached. Consistency between the tool and its source documents was ensured via regular verification of the tool and the source texts.

Step 3: consultation round

A consultation process was conducted to assess perceptions of researchers regarding the proposed tool. The first and last authors of all the retrieved papers in step 2 were contacted to provide feedback on the tool and/or comment wording. The methodology used was based on the assumption that the first author leads the work under the supervision of the principal investigator, who is often placed as the last author (19). However, participants were encouraged to suggest other authors and scholars involved in nutrition priority setting that could provide valuable information. One email and 2 reminders were sent over a period of 90 d. The email was sent

to 50 participants in total. Only those who replied positively were sent the tool for feedback.

Results

Characteristics of existing priority-setting exercises in nutrition research

Of the 53 references identified (Figure 1), 27 papers were eligible for data extraction. Priority setting was used to prioritize nutrition research on a wide range of topics, i.e., obesity, wasting, stunting, malnutrition, and food systems, and for different age, populations, and ethnicity groups (Table 1). Diverse priority-setting methods were used, i.e., debates and discussions, Delphi method, and the CHNRI method. A large part (11/27, 40.7%) of the methods used were a combination of the aforementioned methods. CHNRI (20) was the most reported single method (4/27, 14.8%). All priority-setting exercises were led by research groups based in high-income countries, i.e., the United States ($n = 16$), 8 in Europe, 2 in Canada, 1 in Australia. Although all nutrition research priority-setting exercises were led by authors from high-income countries, 1 paper was implemented in Africa (21), and 2 others focused on minority ethnic groups in the United States (22, 23). Four papers (16, 24–26) reported international organizations as users of the results, without further specification.

A considerable share ($n = 11$, 40.7%) of the papers did not describe stakeholders represented and/or invited clearly. More than half of the papers ($n = 14$, 51.9%) did not describe follow-up activities of the proposed priorities and, of the 27 papers, 5 (18.5%) did not report the source of funding.

Guidance tool development

Values found in the priority-setting papers (Table 2) are grouped in 8 clusters, i.e., understanding, impact, feasibility, efficacy, equity, soundness, sustainability, and novelty. In line with guidance on how to address research waste at large (9), research questions in Table 2 are initially classified as either purely fundamental or applied. Fundamental research questions are defined as questions that attempt to increase our understanding of the topic, whereas applied research questions are defined as questions to be implemented in practice.

The result of the qualitative analysis served as the basis to formulate the tool (Table 3). The categorization of pure fundamental and pure applied research was removed to enhance clarity. In an attempt to make a simple tool and limit the burden on the users, the 8 clusters found in Table 2 were simplified through frequent discussions between the reviewers (CL, WP, DH, and NAB) until consensus was reached upon the 3 values: “feasibility”, “impact”, and “accountability”. Each of the 3 categories has respective aspects to be considered with 2 columns to fill: relevance of the value for the stakeholders involved (from low to high, as well as “not applicable”) and decision explanation/points to consider to justify the relevance selected and to highlight certain aspects that must be considered for specific values.

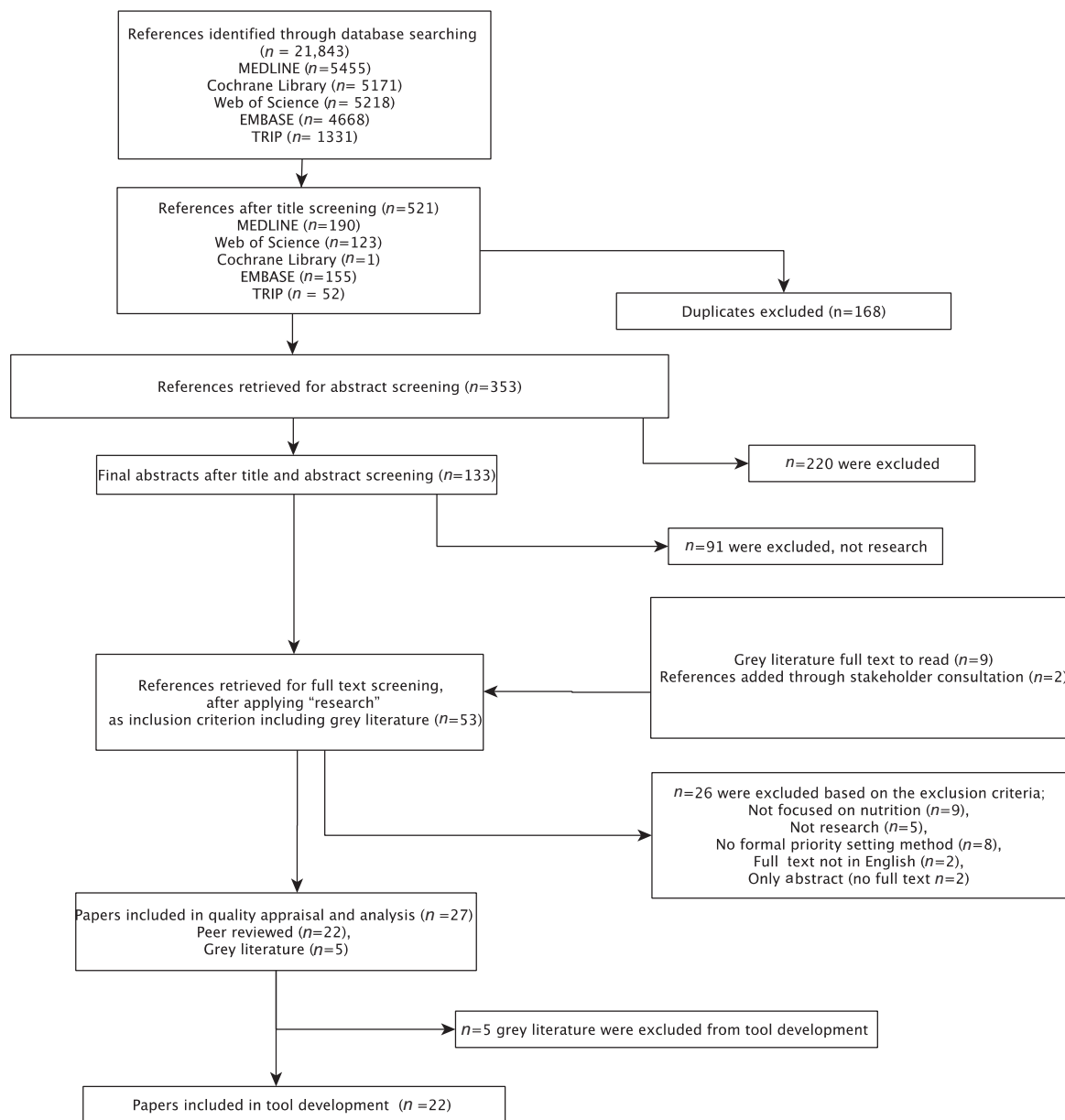


FIGURE 1 The output of the mapping review with research as an extra exclusion criterion. TRIP, Turning Research Into Practice.

Moreover, each category has an empty row, to be determined, in case priority setters have the need to consider more aspects, and an empty column for more values.

The tool draws attention to the broad definitions and criteria for values found in the literature. It encourages those involved in priority settings to go beyond the simple definition of what are feasibility, impact, and accountability and to consider a range of concepts much larger than a simple definition of practicality, pure effect, and responsibility. For instance, feasibility includes the ability of the proposed priority list to be answerable, realistic, and supported (Table 3). Impact looks more comprehensively at other dimensions than effectiveness, including relevance, innovation, empowerment, comprehensiveness, specificity, sensitivity, accessibility, and translation. Accountability is represented as a comprehensive category, emphasizing that

those involved in setting priorities have a responsibility to consider what is already available as well as emerging challenges when doing research. The tool hence fosters reflection on sustainability, environmentally conscious approaches, and inclusiveness when setting priorities in future. We developed a manual to assist readers when using the tool (27). An MS word version of Table 3 can be downloaded from supplementary material.

Consultation round

Out of the 17 authors who replied to participate in the consultation round, 7 authors provided feedback, representing scholars and leading agencies in nutrition including the Global Alliance for Improved Nutrition and the Bill & Melinda Gates Foundation. Five authors agreed to participate but did not provide input. Five authors declined

TABLE 1 Characteristics of priority-setting exercises found in nutritional research¹

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Aggett (35), United Kingdom	Debate	Complementary feeding	International Pediatric Association and European Society of Pediatric Gastroenterology, Hepatology and Nutrition, n = not clear	Caregivers and policymakers, health professionals	The Infant Food Manufacturers	NA
Kumanyika et al. (23), United States	2-d workshop	Obesity	African-American researchers, n = not clear	The National Heart, Lung, and Blood Institute and the NIH overall	The CDC	Follow-up of the workshop: research project ideas, funding proposals, position papers, and presentations, and further development of a focal point to continue the dialogue
Alley et al. (36), United States	Formal presentations and informal discussions	Causes and consequences of changes in body weight and composition over the aging process	Working Group, n = not clear	Researchers that address the questions mentioned in a special section of the Journal	NA	Call for papers that address these questions for a special section of the Journal, to be published in 2009
Angood et al. (24), United Kingdom	CHNRI	Links between wasting and stunting	18 of the 25 members of the existing TIG facilitated by the Emergency Nutrition Network took part in the survey, 16 completed the survey in full	International agencies, research funding bodies, donors, governments, and policymakers	USAID and the Bill & Melinda Gates Foundation	NA
Angood et al. (25), United Kingdom	CHNRI	The management of acute malnutrition	"Core group" of authors of the paper, n = 64 individuals participated in the survey	Governments, researchers, investors, international organizations, and national agencies	USAID/OFDA and Irish Aid	NA
Brown et al. (37), United States	CHNRI	Zinc research in child health	A group of 7 leading experts in the field of zinc research in child health	Not clear	CHNRI	Repeat periodically, possibly with a larger group and reference group of stakeholders, as new information becomes available
Bizzard and Sievert (38), United States	A conference; the results were circulated inviting extra comments.	Dietary assessment methodology	41 speakers participated in the conference; 3 categories of invited presenters: 1) researchers working on research relating to dietary assessment methodology; 2) major users of dietary assessment methods; 3) policymakers; 19 of the 41 respondents gave comments for revisions of the lists of research priorities and recommendations	Not clear	University of Minnesota, WHO, and the FAO of the UN	Follow-up conference and ongoing forum to continue the process of updating and revising the priorities

(Continued)

TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Byrne et al. (39), Australia	Delphi technique (2 stages)	Longitudinal research on childhood and adolescent obesity questions	ACAORN; in Stage 2, delegates to the 2005 conference of the Australian Society for the Study of Obesity (a scientific organization of >600 medical practitioners, and other health care professionals) repeated the prioritization; Stage 1: 32 members of ACAORN; Stage 2: 39 of the 75 attendees contributed	Funding bodies, researchers, medical practitioners, and medical staff	ACAORN, an NHMRC Australian Public Health Training Fellowship, and an NHMRC Population Health Career Development Award	NA
Curtin et al. (40), United States	Delphi and a survey	Obesity	The HWRN, including family members, self-advocates, and policy leaders; 1st Delphi Round: n = 18/20 participants provided responses; a final vote via an online survey: 75% (15/20) of HWRN members and advisors ranked the 4 most important themes	HWRN	Health Resources and Services Administration Maternal and Child Health Bureau, NIH	Anticipation that the research agenda will be reviewed, re-evaluated, and refined as the Network evolves and matures: reaching out to the broader community of stakeholders to obtain their input
D'Andreamatteo et al. (41), Canada	Mixed method with 1) scoping review; 2) national online stakeholder survey; 3) key informant consultations in the form of interviews and online survey; 4) national workshop; and 5) triangulation of textual and quantitative data	Nutrition and mental health	Canadian Institute of Health Research, Dietitians of Canada, Canadian Mental Health Association, the University of British Columbia, the University of British Columbia Behavioral Research Ethics Board; n = 811 for national online stakeholder survey; n = 299 dietitians responded; n = 105 were invited either for an interview or to complete an online key-informant questionnaire, n = 79 responded; n = 16 participated in a national workshop	Dietitians	A Planning Grant of the Canadian Institutes of Health Research; the Canadian Mental Health Association (Ontario), Dietitians of Canada, and the University of British Columbia, School of Nursing	Integrate the findings into further development of relevant content for the Practice-based Evidence in Nutrition database and Learning on Demand. Long-range plans entail outlining directives that formulate these findings into actions that target training, continued education, knowledge dissemination, as well as research, advocacy, and policy initiatives

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TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Lachat et al. (21), Europe	Mixed methods: 1) review of institutions publishing nutrition research and type of research; 2) analysis of the perceptions of nutrition research by researchers, through 3 regional workshops; 3) assessment of the nutrition research priorities of stakeholders, and identification of research needs for environmental challenges	Malnutrition	SUNRAY consortium (academics from 4 European institutions, academics from 4 universities in Africa, an international nongovernmental organization, and an organization that funds research in SSA), researchers and policymakers in SSA, external stakeholders (i.e., government officials, UN agencies, nongovernmental organizations, bilateral donors, and the private sector), Department for International Development (UK), with the European Commission, and during a national workshop in Benin for Beninese and Togolese stakeholders; <i>n</i> = 117 participants from 40 countries in SSA attended the workshops; participants were principally senior researchers (52%) and policymakers (30%) in nutrition, the remaining participants (18%) were external stakeholders	NA	The European Commission	An annual course on evidence-based nutrition was piloted after SUNRAY and initiated the development of a knowledge network for evidence-based nutrition in Africa
McKinnon et al. (42), United States	Mixed methods: semistructured telephone interviews, followed by a meeting; a conference call was held by the National Cancer Institute after the meeting	Obesity	The participants represented a range of organizations, including academic research institutions, health organizations, private and federal research funding agencies, and state and federal government agencies; <i>n</i> = 27 participants and <i>n</i> = 11 nongovernment experts who had been invited to the meeting had a telephone interview	Knowledge generation partners and knowledge transfer/generation partners	No financial disclosures	Begin the work of building the evidence base for obesity policy, by evaluating the effects of next/existing policies
McPherson et al. (43), Canada	Mixed methods: a multistakeholder workshop with multiple methods	Disability and Obesity in Canadian Children Network	Researchers; trainees; front-line clinicians; parents; former clients with disabilities; community partners; and decision makers; most invitees were Canadian; <i>n</i> = 38 invited attendees: 12 researchers; 4 trainees; 12 front-line clinicians; 3 parents; 1 former client with disabilities; 3 community partners; and 3 decision makers	NA	Canadian Institutes of Health Research, Holland Bloorview Kids Rehabilitation Hospital, and Bloorview Research Institute	DOCC-Net will be promoted across all Canadian provinces and disseminated through pan-Canadian organizations; international partners will also be encouraged to contribute their expertise to DOCC-Net and disseminate relevant information across their networks

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TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Menon et al. (44), United States	Mixed methods: working group, e-consultation, conference, published literature (deliberations)	A nutrition implementation-focused framework	The New York Academy of Sciences, delivery science working group, multiple stakeholders including academia, intergovernmental organizations, nongovernmental organizations, the private sector, and the public sector; <i>n</i> = ~54 respondents participated in the survey	NA	NA	NA
Nagata et al. (45), United States	Modified version of the CHNRI priority-setting method in 3 phases	Adolescent health in low- and middle-income countries	Experts were identified through 1) journal publications, membership of journal editorial boards, from lists of participants at WHO meetings and consultations, and by nominations from WHO departments; 2) participants at WHO meetings and consultations held in 2010–2015 and that were relevant to the 8 adolescent health areas through reports that were available on the WHO website and the WHO Index Medicus; 3) representatives of the WHO departments relevant to each health area to review the lists and nominate any additional key experts in their respective fields—overall, this resulted in 265 additional experts; combining the list of experts resulted in a total of <i>n</i> = 450 different individuals, <i>n</i> = 217 (48%) agreed to participate; in October 2015, <i>n</i> = 15 external experts joined the authors and other WHO staff in a meeting at which the methods and preliminary findings were discussed before they were finalized; <i>n</i> = 142 experts submitted questions; scored questions by health area (<i>n</i> = 130)	Donors, program managers, and researchers to stimulate and develop research in adolescent health	US Agency for International Development and the Mary Duke Biddle Clinical Scholars Program, Stanford University	NA

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TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Ohlhorst et al. (46), United States	Mixed methods: in 2011 the ASN reached out to experts; then, it convened a Working Group to determine the nutrition research needs and share them via ASN's member newsletter	The prevention and treatment of nutrition-related diseases	ASN's Public Policy Committee, scientists and researchers representing a cross-section of the Society's membership; the characteristics of the conference attendees and newsletter members are not clear; in September 2011, ASN's 75 leaders developed a draft list of nutrition research needs; in February 2012, ASN convened a Working Group; workshop was held with nearly $n = 250$ attendees; to inform and seek input from ($n = 5000$) members (who didn't attend the annual meeting or workshop) the results were shared via ASN's newsletter	Stakeholders with differing areas of expertise to establish the evidence-based nutrition guidance and policies	NA	NA
Ramirez et al. (22), United States	A modified 3-round web Delphi survey	To reduce and prevent Latino childhood obesity	Females and predominantly Hispanic/Latino followed by Whites, African Americans, Asians/Pacific Islanders, and other ethnicities; most participants were academicians or researchers, followed by health educators or administrators or managers and clinicians, and public health workers; Delphi respondents were located in 31 US states; first Delphi round: 579 invitations were sent; $n = 177$ individuals responded; second Delphi round: 103 people completed the survey, of whom $n = 57$ had completed Round 1 (55.3%) and $n = 46$ were new participants (44.7%); third Delphi round: 194 people completed surveys, of which $n = 93$ completed a survey in Rounds 1 and 2 (47.9%) and $n = 101$ were new recruits (52.1%) from the Salud America! network	Investigators, educators, health care providers, and communities to collaborate on childhood obesity prevention and control	RWJF	Results will guide the development of a call for proposals to support 20 pilot projects aimed at identifying effective prevention and control strategies, encouraging partnerships and collaborations; it also will guide others in developing new and innovative ecologic interventions focusing on the identified research areas and priorities to fight Latino childhood obesity

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TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Ward et al. (47), United States	Mixed methods: meeting, conference, online survey, voting	Identify the key issues related to obesity prevention research in ECE settings	Faculty from a variety of universities, representatives from multiple foundations interested in child obesity prevention, delegates from multiple branches of the NIH and the US Department of Health and Human Services, and other key leaders in ECE; not clear how many were initially invited to the conference, <i>n</i> = 43 attendees; among the 43, 44% completed the follow-up online survey to identify research priorities	Funders, both federal agencies (such as NHLBI, CDC, and USDA) and foundations (RWJF, American Health Association, and others)	The NHLBI and Office of Behavioural and Social Sciences Research; the RWJF's Healthy Eating Research and Active Living Research programs, the Nemours Foundation, and the Altarum Institute; University of North Carolina's Center for Health Promotion and Disease Prevention, a member of the Prevention Research Centers Program of the CDC	NA
Pratt et al. (48), United States	Workshop	Childhood obesity prevention and treatment	Leaders and representatives from public and private academic and medical institutions with expertise in a variety of health specialties and research methodology, staff from the NIH and the USDA, <i>n</i> = NA	Investigators and funding agencies in setting research agendas for childhood obesity prevention and treatment	NA	NA
Wu et al. (49), United States	Mixed methods: 1) a comparative effectiveness review and meta-analysis; 2) a 3-round Delphi process with the use of a web-based assessment tool	Childhood obesity	A modified Delphi process with 6 expert stakeholders with potential interest in childhood obesity prevention such as parents, researchers, and representatives from government, public agencies, <i>n</i> = 6	Researchers and funding agencies	The Agency for Healthcare Research and Quality	NA
Haddad et al. (16), United Kingdom	Conclusion from compiling a report commissioned by the Global Panel on Agriculture and Food Systems for Nutrition	Food systems	<i>n</i> = NA	Researchers, funders, governments, delegates to the G20 and G7 2017 meeting	NA	NA

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TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
Black et al. (17), United States	NA	To reassess the problems of maternal and child undernutrition	Maternal and Child Nutrition Study Group, Series Advisory Committee, n = NA	NA	Bill & Melinda Gates Foundation	NA
Bill & Melinda Gates Foundation and UK Aid (50), United States	Mixed methods: 1) a review of existing evidence of agriculture nutrition linkages and explored research; 2) consultations with leading researchers in the field to solicit ideas of where knowledge gaps still exist	Nutrition-sensitive agriculture	Not clear, but they state consulting leading researchers, n = NA	Researchers, policymakers, and program implementers	UK Aid, Bill & Melinda Gates Foundation	This white paper serves as the basis for a soon-to-be-announced Request for Applications from the UK Department for International Development and the Bill & Melinda Gates Foundation
Commission of the European Communities (51), Europe	Not clear	Contribute to reducing ill health due to poor nutrition, overweight, and obesity	Commission of the European Communities, n = NA	Member states, private actors, international cooperation	The European Commission	Collaborate with the WHO to develop a nutrition and physical activity surveillance system for the EU-27; a review of obesity status progress in 2010; a Green Paper on urban transport in 2007, followed by an Action Plan in 2008; publish guidance on sustainable urban transport plans; a White Paper on Sport; in 2007 the Commission will finance a study looking at the relation between obesity and socioeconomic status with a view to considering the most effective interventions

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TABLE 1 (Continued)

Reference	Priority methodology	Objective	Who is represented, # of experts	Target audience	Funding source	Follow-up of the results
The Sackler Institute for Nutrition Science (52), United States	Mixed methods: Academy of Sciences Group identified 3 critical "Focus Areas" topics; Focus Area Working Groups developed critical gaps in knowledge, a web-based consultation for feedback followed, the conclusion was presented during a conference	Malnutrition	The Sackler Institute for Nutrition Science, academic and nonprofit researchers, WHO, Humanities Global Development; n = 55 researchers, organized in Focus Area Working Groups, developed more than 20 critical gaps in knowledge from the broad Focus Areas; a web-based consultation secured feedback from >100 stakeholders in the nutrition science community—from both developed and developing countries—on these critical areas	The research community and stakeholders in the field of nutrition towards focusing on pressing research needs	The New York Academy of Sciences in partnership with the Mortimer D. Sackler Foundation	Specific research proposals focusing on the gaps identified in this agenda will be developed; the Sackler Institute will hold working sessions and symposiums that will bring together key stakeholders to support these projects in nutritional, agricultural, and environmental sciences; public health; and policy
Byrne and Daniel (53), Europe	NA	Sustainable food and nutrition security	Joint Programming Initiative: a healthy diet for a healthy life, n = not clear	All age groups	Joint Programming Initiative	Implementation Plan every 2–3 y in which the actions and activities to be carried out in the next years are presented
The AFRESH Project (54), Europe	NA	I—Tackling avoidable diet- and lifestyle-related noncommunicable diseases; II—Implementation of the European "Lisbon strategy" at the regional level	The AFRESH Project: 16 stakeholders from 8 European regions work together, n = NA	Enterprises, research organizations, and regional authorities; European population	The European Union's Seventh Framework Programme for Research and Technological Development	NA
UNSCN (26), Europe	A review of global commitments and goals, recommendations in the 2014 Global Nutrition Report, and stakeholder consultations	Framework for UN action in response to global and country nutrition goals for the years to come	The UN agencies with a key mandate in nutrition: FAO, IFAD, UNICEF, WFP, and WHO; n = NA	Agencies and interagency teams at global, regional, and country levels	Flemish government	NA

¹ ACOARN, The Australian Child and Adolescent Obesity Research Network; AFRESH, Activity and Food for Regional Economies Supporting Health; CHNRI, Child Health and Nutrition Research Initiative; DOCC-Net, Disability and Obesity in Canadian Children Network; ECE, early care and education; HWRN, Healthy Weight Research Network; IFAD, International Fund for Agricultural Development; NA, not available; NHLBI, National Heart, Lung, and Blood Institute; NIMRC, National Heart and Medical Research Council; OFDA, Office of U.S. Foreign Disaster Assistance; RWJF, Robert Wood Johnson Foundation; SSA, sub-Saharan Africa; TIG, Technical Interest Group; UNSCN, United Nations System Standing Committee on Nutrition.

to participate: 3 owing to time constraints, and 2 reported not having the right expertise.

In response to the feedback received, the layout of the tool was simplified. The final tool contains 3 categories of values for all types of research. The distinction between fundamental and applied research was omitted as the results from the consultation rounds indicated confusion with the 2 categories. As a result, additional values relevant only for applied research were clarified, but mentioned alongside values relevant for both fundamental and applied research. In addition, relevance rankings were simplified to low, medium, and high relevance (as opposed to our original 5 level options). Other comments related to rewording of sentences and to logical ordering of values in the table were considered. One expert suggested applying each value to each prioritized question instead of to the exercise as a whole. The final version of Table 3 was sent to COHRED for external review.

Discussion

The present research adds to the larger body of work considering how values shape agendas in nutrition. Attention towards solving malnutrition and improving nutrition has increased lately with a Decade of Action on Nutrition declared by the UN General Assembly in 2016 (28). Some work has been done to embed nutrition agenda setting for policy considerations, e.g., Nutrition for Growth (29), and the Mainstreaming Nutrition Initiative which considered the importance of values, strategies, and actions in several countries (30). The findings of our review call for more consistency between the values used and the reporting of the priority-setting exercises. For instance, although the majority of the papers valued impact, there was an apparent lack of transparency in the reporting of the follow-up plan, and outcome processes of the priority-setting exercises.

The tool does not assess the importance of specific values as such, nor does it serve as a quality stamp for research priority exercises. Rather, it aims to trigger explicit and open-ended reflection on research, in which values can be adopted or forfeited, but not neglected. In this sense, it provides guidance and opportunity to reflect on the criteria chosen to rank the priority options proposed. The tool is proposed to complement existing priority-setting methods (13, 20, 31, 32). For instance, CHNRI proposes a pre-established list of criteria to rank research questions, whereas the present tool provides guidance and opportunity to take time and reflect on the criteria chosen to rank the priority options proposed.

The tool serves a double purpose. First, the tool provides a set of values that can be systematically discussed in the process of research priority setting. Second, it can also serve as a reporting instrument to increase transparency on how values were considered in the process of priority setting. As such, the guidance tool improves rational use of limited resources for research. The tool aims to draw attention to the accountability of those involved in setting research priorities and ensures due attention to, and transparency in, values during this process. However, like any other instrument, the

proposed tool will require further testing before its potential to improve priority setting is fully assessed (33).

Because the tool is built around the values that were already explicitly or implicitly reported in existing priority-setting exercises in nutrition research, it is applicable to different research types and topics. By extension, it is also applicable to other fields of biomedical research.

As values are by definition open to interpretation, the discussion on their relevance and relative priority over others is left to the discretion of those setting priorities. Even with considerable disagreement on the definition (e.g., what is meant with justice?) or the implications (e.g., what does a just intervention require?) of values, it still makes sense to explicitly consider all relevant values in priority-setting exercises. In this way, the proposed tool facilitates the process of eliciting a comprehensive debate ensuring that relevant values are not ignored and that research agendas are not solely inspired by coincidence, practicality, or hype, rather than by a profound consideration of what matters most. During the consultation round, 1 expert commented on the level at which the tool should be applied, proposing to apply it for every question at hand. Although this was a relevant suggestion, applying the tool to every research option would add considerable burden to those involved in the discussions. We therefore propose to apply the tool on the priority-setting exercise as a whole, as it is essentially meant to be a tool for debate and discussion.

Adequate consideration of values during the priority-setting exercise requires proper preparation and methodological considerations. Box 1 summarizes the conditions that need to be fulfilled before starting the research prioritization. These conditions correspond largely with previous recommendations to reduce research waste when setting research priorities (9).

Box 1 Prerequisites for initiating research priorities exercise

Before setting priorities, consider the following:

- Is enough known on the topic? Consider carrying out a systematic review of literature to understand the options discussed (e.g., disease burden)
- Can additional information (e.g., current developments) be provided to set priorities for research?
- Are the background information and rationale communicated adequately to all priority-setting participants (e.g., briefing, training participants)?
- Are participants informed sufficiently about the procedures and use of results of the priority-setting exercise? Should participants of the priority-setting exercise complete an informed consent? Is the involvement of participants recognized?

Although potentially eligible papers in informal and unpublished reports within the context of institutional settings for example were not considered, we still noted that all of the research-setting exercises reviewed were conducted in high-income countries. Despite the high needs and limited resources, it remains unclear how, and if, priority-setting

TABLE 2 Values found in the priority-setting exercises in nutrition research along the priority-setting cycle

Value	Pure basic research	Pure applied research
Impact	<ul style="list-style-type: none"> – Dissemination – Research translation – Timeliness – Answerability (21, 23–25, 35–42, 44–49) 	<ul style="list-style-type: none"> – Commitment – Effectiveness – Acceptability – Community concerns and demands – Accessibility – Affordability – Education prevention (16–17, 21–25, 35, 37–38, 40–42, 44–48)
Understanding of the problem	<ul style="list-style-type: none"> – Long-term consequences – Burden – Comprehensiveness (Global) – Quantification – Specificity (16–17, 21–25, 35–49) 	—
Feasibility	Research infrastructure (16, 21, 23–25, 36, 38, 40, 42–43, 46–47)	Infrastructures <ul style="list-style-type: none"> – Deliverability – Expertise – Funding – Network (16–17, 21–25, 35, 37–38, 40–49)
Efficacy—cost effectiveness	—	Applied research is carried out in the most cost-effective way (24–25, 41–42, 46–48)
Equity	Equal opportunities for all ethnic groups to conduct research, equal inclusion of all ethnic groups and vulnerable groups in research addressing nutrition problems (23, 43)	Equal opportunities for all ethnic groups to implement research, equal inclusion of all ethnic groups and vulnerable groups in research implementation addressing nutrition problems (23–25, 35, 37, 40–41, 43, 45, 47–49)
Sound methods	<ul style="list-style-type: none"> – Measurability – Validity – Appropriateness – Reliability – Standardization of definitions and cutoff – Representative – Participatory research – Social grounding and perceptions – Transparency (16, 21–25, 35, 37–44, 47–48) 	Accountability Safety (do no harm) (16, 22, 24–25, 35–37, 44, 48)
Sustainability	Doing research to evaluate and monitor the implemented interventions (21, 47)	Respect for environment Adaptability Prevention Capacity building Education Evaluation and monitoring (16, 21–25, 35, 37–40, 42–45, 47–49)
Novelty	Exploring new methods, new approaches, and new interventions (16, 22–24, 37–40, 43–44, 46–49)	

exercises for nutrition research in low- and middle-income countries are done. This complicates inclusive and equitable approaches to global challenges in nutrition, and calls for more research to understand how the research agenda is being set in low- and middle-income countries. Equitable consideration of priorities from local stakeholders compared with those of international researchers or donors is a concern (34).

We acknowledge that the proposed tool requires testing and evaluation by various stakeholder groups to ensure its correct understanding and application. Moreover, the tool has been built and developed by researchers based on research output from high-income countries. Hence, it does not necessarily reflect the values of stakeholders in low- and middle-income countries, and further research is needed to understand values in this context. Further investigations are

needed to assess understanding, applicability, and legitimacy of the tool when setting research priorities in low- and middle-income countries. We are encouraging contributions from groups who work on research prioritization and are willing to apply the tool in their process.

Acknowledgments

We thank Sara Abassbhay, MSc (intern at Ghent University) for double checking Table 1 results, and Prof Andrew Booth for support in abstract screening for the mapping review. We thank the following people for their feedback on the guidance tool: Lawrence Haddad, Executive Director, Global Alliance for Improved Nutrition (GAIN); Carla D'Andreamatteo, RD, MSc, The Food Lady; Sarah D Ohlhorst, MS, RD, Senior Director of Advocacy and Science

TABLE 3 Value-oriented guidance tool for priority-setting exercises¹

Value		Relevance	Decision/points to consider
FEASIBILITY			
Answerable	The research hypothesis is both clear and has the potential to be answered	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Realistic	The infrastructure to undertake the research is considered (e.g., funding, expertise, sufficient prior knowledge, etc.)	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
	The infrastructure necessary to deliver the applied research is considered (e.g., funding, expertise, network, etc.)	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Supported	The necessary stakeholders (e.g., government, funders, researchers) commit to the implementation	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
TBD	<i>(Empty row to add a value)</i>	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
IMPACT			
Relevant	The research advances scientific knowledge and/or practice (e.g., definition, burden, scope) and is addressed at a suitable moment in time e.g., there is a sense of urgency	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Practice-oriented	Translation and implementation of research results are considered	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Accessible	The accessibility of the applied research (e.g., affordability, proximity, reachability) by the target population is maximized	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Effective	The research has the potential to achieve the desired outcomes	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Context-sensitive	Social or cultural disapproval by the target population <i>and</i> demands and preferences of the target population are taken into account	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Specific	Research is sufficiently targeted/focused to certain problems/populations/contexts	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Comprehensive	A wide range of relevant elements (scope, long-term effects, contextual approach) are considered in the research	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
	If applied, different approaches including preventive approaches are considered	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Empowering	The pure research enables the target population to promote their own health (e.g., through prevention, improved capacities for self-care)	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Innovative	The research topics go beyond traditional methods, approaches, and thinking around the topic	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
TBD	<i>(Empty row to add a value)</i>	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
ACCOUNTABILITY			
Reported	Dissemination of research findings beyond the research team is anticipated (e.g., publication, public presentation)	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Transparent	Research data, methods, and evidence are publicly reported	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Sound	The research uses appropriate, valid, and reliable methods	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Environmental friendly	The research takes into account environmental sustainability and minimizes environmental harm	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Cost-effective	Efficient use of resources to achieve the maximum impact	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Sustainable	The applied research targets long-term improvements (e.g., capacity-building, adaptability)	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Quality assured	The research has a monitoring and evaluation plan	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
	The applied research has a monitoring and evaluation plan	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
Inclusive	The research adopts participatory approaches in which different stakeholders are represented	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
	If it is applied research, it is not increasing inequity in society and seeks to maximize fairness	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	
TBD	<i>(Empty row to add a value)</i>	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High <input type="checkbox"/> NA	

¹NA, Not Applicable; TBD, To Be Determined.

Policy, American Society for Nutrition (ASN), Rockville, MD; Shelly Sundberg, Senior Program Officer, Nutrition, Bill & Melinda Gates Foundation; Carel IJsselmuiden, COHRED. The authors' contributions were as follows—CL, DH, and WP: conceptualization; DH and RV: developed search strategy; DH: data curation; DH, NAB, and WP: qualitative data analysis; CL, DH, NAB, PK, and WP: drafting the tool; CL and WP: supervision; CL and DH: wrote the first draft of the manuscript; NAB, PK, WP, and RV: contributed to the writing of the manuscript; and all authors: agree with the manuscript's results and conclusions, have read and

approved the final version of the paper, and confirm that they meet ICMJE criteria for authorship.

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