

# Equity in agriculture-nutrition-health research: a scoping review

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*Links among agriculture, nutrition, and health (ANH) are established, but the role of inequity is less understood. In this scoping review, we aimed to understand the range of ways that ANH research addresses inequity issues in low- and middle-income countries. We used PRISMA guidelines to structure our study. From an initial >26 000 studies, 243 published reports met inclusion criteria and were mapped. The number of reports addressing inequity in ANH research has increased over time from < 10 articles in 2008 to > 40 in 2018. Within equity, a majority of articles (n = 327) focused on describing how nutrition and health outcomes differ for different groups. Many (n = 134) looked at the material circumstances that shape people's life chances. Fewer (n = 51) looked at the most basic structural determinants of (in)equity. The same aspects of equity remain the least studied in ANH research, including the intersections of equity issues shaping life chances, and inequity's structural determinants. We suggest ways forward for this community, drawing on conceptual frameworks and theory of inequity from different disciplines.*

## INTRODUCTION

The links and feedback loops among agriculture, nutrition, and health (ANH) in low- and middle-income countries (LMICs) are clearly hypothesized, and the empirical evidence describing, analyzing, and clarifying these links is growing by the day.<sup>1,2</sup> Engagement in agriculture can affect nutrition and health directly, for instance through the production of diverse foods for consumption<sup>3</sup> or exposure to harmful chemicals.<sup>4</sup> Engagement in agriculture or food systems can generate income that may be spent on goods to enhance (or undermine) nutrition or health,<sup>5</sup> and agricultural growth can be a source of poverty reduction more generally in some contexts.<sup>6</sup> Agriculture and food systems set the relative prices of different foods, shaping affordability

of different foods<sup>7</sup> as well as the broader food environment that affects desirability and quality of foods.<sup>8</sup> Each of these pathways is mediated by personal characteristics such as gender,<sup>9</sup> which can shape issues such as engagement in agriculture or intrahousehold allocation of nutrition and health goods.<sup>10</sup>

The United Nations Sustainable Development Goals contain targets to improve aspects of each of these issues in developing countries, and provide a roadmap that places emphasis on “leaving no one behind” in the rush for development. Leaving no one behind implies a focus on equal outcomes but also equitable processes and avoiding structural flaws that leave out certain groups in achieving development indicators.<sup>11</sup> What is seen in practice, however, is marginalization and structural inequities shaping unequal

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outcomes and limiting global progress on the goals.<sup>12</sup> There is therefore a need to understand how issues of inequity and inequality are shaping progress on agriculture for nutrition and health in these countries.

Equity is not a new concern for social research or international development: The World Bank in 2006 focused its annual report on equity and development,<sup>13</sup> and organizations and individuals working on human rights, justice, and inclusion have long focused on the reasons why certain groups have poorer outcomes. The concept of equity, however, is contested, with multiple different interpretations in different fields: The World Bank report defines equity simply as fairness at different levels, with economic definitions focusing on issues of distribution and equality of opportunity.<sup>13</sup> A relatively recent review of the idea in international development policy and practice has described equity as comprising “equal life chances, equal concern for people’s needs, and meritocracy,” with inequity usually grounded in power imbalances leading to social and political exclusion.<sup>14</sup> In sociology, the idea of inequity emerged from work to understand changing societies in rapidly industrializing Western countries in the last century, looking at the social and political structures that create differences in both opportunities and outcomes for different social groups.<sup>15</sup> Underpinning philosophical understandings of equity are a range of traditions, from work on entitlements and capabilities,<sup>16,17</sup> to social justice,<sup>18,19</sup> to anti-capitalist Marxist<sup>20</sup> approaches. Definitions generally agree on inequity being grounded in issues of power shaping structural causes of inequality, and equity requiring an inclusive process, even if they disagree on whether it is people’s needs or rights that should be upheld.<sup>21</sup>

Equity by some definition is therefore fundamental to understanding how different nutrition and health outcomes are shaped in the fields of food and agriculture in LMICs, a particular subdiscipline of international development research. Agriculture for nutrition and health (ANH) research has included research on issues such as gender disparities and relative poverty in assessing how engagement in agriculture affects nutrition and health outcomes, for instance.<sup>22,23</sup> There has also been work on how differential access to agricultural assets shapes opportunity<sup>24</sup> and how ANH interventions try to change gender norms at more fundamental levels.<sup>25</sup> Being aware of this snapshot of equity-focused work in the ANH field, we were keen to explore the totality of this body of work, to understand different approaches that have been used over time to understand how equity affects nutrition and health through agriculture, and how that might inform an ANH research agenda going forward.

Authors of previous reviews have looked at single aspects of equity such as gender in ANH research<sup>26</sup> and

how inequities shape nutrition outcomes outside of agriculture,<sup>27</sup> but none that we are aware of has looked at the broad issue of how equity is addressed across ANH research. Our aim, therefore, was to take stock of how ANH research is addressing issues of inequity and inequality in LMICs in order to pinpoint gaps in knowledge that might be limiting action to leave no one behind in these important areas of social and economic development. The broad question driving the study was: How does ANH research address equity issues in LMICs? Within this, we also wanted to understand how different disciplines understand and research equity in ANH, and how a focus on equity has changed over time.

Ours is a broad research question and therefore lends itself to the process of a scoping review, an approach to reviewing academic literature in which the topic is broad rather than defined, and in which a range of different research types might be relevant and available.<sup>28</sup> Scoping reviews are a relatively rapid form of review, aiming to systematically gather and map the key concepts and sources underpinning an area of research and to identify knowledge gaps that researchers might choose to address in future work, but not necessarily to assess the quality of the canon of research or to draw further inference from it.<sup>29</sup> In this article, we describe the findings of a scoping review of the treatment of equity in ANH research in LMICs.

## METHODS

We followed the PRISMA guidelines extension for scoping reviews<sup>30</sup> for this work with the following exclusions of nonessential aspects: A protocol registration was not undertaken for this review, because the approach of the scoping review was designed to be reflexive, drawing on the diversity of experience and methodological competence in the review and advisory team and shaping the search and screening strategy in an iterative manner over the course of the review. Also, critical appraisal within or among evidence sources was not undertaken, because we aimed to identify the scope but not the quality of available research on the broad topic.

### Conceptual frameworks

The scope of our review was defined by 4 core aspects (Figure 1); therefore, these core aspects shaped the following searching and screening strategies: 1) agriculture as a context or intervention; 2) nutrition or health outcomes; 3) equity as a key aspect of the research (used in the analysis or theoretical positioning of the work); and 4) LMICs as the context for the research. Studies had to

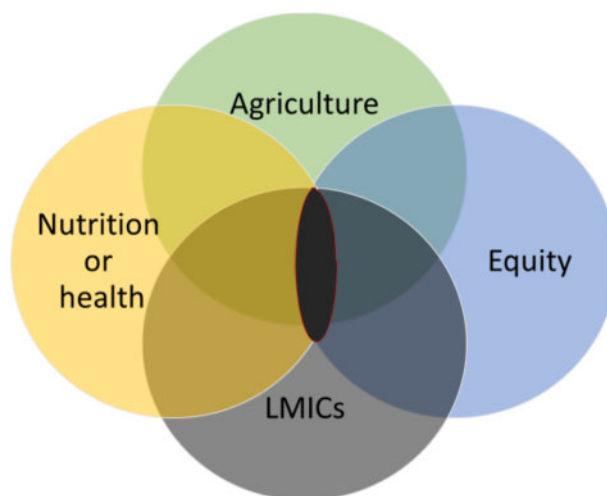


Figure 1 Concepts defining inclusion in the review. LMIC, low- and middle-income country

clearly identify all four of these aspects in the title or abstract to be included in the review (ie, the darkest central section of the Venn diagram in Figure 1); where one or another aspect was strongly suspected but unclear from the abstract, we accessed the full text to make a final decision on inclusion.

We worked with existing conceptual frameworks for each of the core aspects to define key ideas for the search terms (Table 1). In conceptualizing equity, we started with 2 key frameworks in particular: 1) The PROGRESS-plus characteristics identified by the Cochrane group as stratifiers of health opportunities and outcomes,<sup>31</sup> which mix characteristics defining aspects of inequality with structural equity factors shaping these outcomes. [Note: PROGRESS-plus characteristics are place of residence, race/ethnicity, occupation, gender, religion, education, socioeconomic status, social capital, personal characteristics, features of relationships, and time-dependent relationships.] 2) The framework of the World Health Organization Commission on the Social Determinants of Health,<sup>32</sup> which stratifies the social determinants of health into socioeconomic and political context, social position, and intermediary determinants including material circumstances and behaviors. From these, as well as looking at core equity terms (often used interchangeably with equity) such as marginalization and disempowerment, we determined an approach to understanding equity in our review at 3 levels:

1. Looking at unequal outcomes stratified by personal characteristics that describe aspects of social position, such as poverty, ethnicity, age, gender, disability, or geographic location. We also looked for studies of the intersections of any of these, such as how a younger woman from an ethnic minority might be multiply disadvantaged in a process termed *intersectionality*.

2. Underlying unequal outcomes are material circumstances, such as human capital and resources available to a person to shape these outcomes, including land or water ownership or access, market access, educational or knowledge disparities, and other material, social, human, or natural capital.
3. At the most basic level, structural determinants shaping the sociopolitical context underpin the material circumstances of different individuals and groups. Structural determinants of marginalization include social norms, political voice, the commercial context, power differentials in any of these, and the role of ideology or values in shaping inequity.

We have published a framework that describes these levels of equity and their role in nutrition, specifically, in more detail.<sup>33</sup>

In conceptualizing agriculture, we found through initial searches and discussion that we needed to broaden this to food systems (of which agriculture is a key part and difficult to separate from downstream processes such as value chains). We reviewed the key conceptual framework for food systems in LMICs<sup>34</sup> to identify different levels of the food and agriculture concept. These included terms relating to primary production (on-farm), value chains (off-farm), food safety, food security, and the environment.

In conceptualizing nutrition and health, we defined a spectrum of potential outcomes that have been addressed in previous ANH research. For nutrition, this included terms relating to diets (what is eaten, measured in metrics such as dietary diversity or quality), undernutrition (the result of lack of nutrients, measured in metrics such as stunting and underweight), and overnutrition (the result of overabundance or imbalance, measured in metrics such as obesity or noncommunicable chronic disease). For health, this included terms related to clinical health (including communicable

diseases, zoonotic disease, and mental health outcomes), occupational health (including heat exposure, pesticide exposure, and other health issues related to working in agriculture or food systems), and environmental health (including antimicrobial resistance, and pollution and contamination from agriculture or food systems).

Finally, LMICs (and global regions) were defined and searched for on the basis of country income classifications for the World Bank's 2018 fiscal year,<sup>35</sup> because these countries were the focus of our research aims. [Table 1](#) lists full definitions of the different aspects of equity, agriculture, nutrition, and health used in this review. These concepts were then used to create the search terms, inclusion and exclusion criteria, and mapping criteria for the study.

### Search process

Applying these concepts, one author (W.T.) searched 3 electronic bibliographic databases for peer-reviewed published work: Medline, to find health and nutrition-focused articles; CAB Direct, to find food- and agriculture-focused articles; and Web of Science, to find social science articles. Several rounds of test searches were run in the Medline database to refine the search terms and achieve the best balance of sensitivity (ie, the ability to pick up relevant articles, assessed by checking for known relevant articles in the search results) and specificity (ie, the ability to exclude at the search stage articles that are irrelevant and result in an unmanageable number of hits, assessed by screening random selections of hits and determining problematic search terms). For the final searches, the same search terms were used in each database, and the search syntaxes were kept as similar as possible in the different bibliographic search systems. [Appendix S1](#) in the Supporting Information online lists the search terms for each topic, and [Table S1](#) in the Supporting Information online lists the full searches undertaken in Medline.

The literature searches were conducted on March 19, 2019, and all databases were searched from 2008 to 2019. The year 2008 was deemed a logical start date because this was the year that global research institutes started to set up key ANH research groups (eg, the CGIAR Research Program on Agriculture for Nutrition and Health<sup>36</sup>), the year of the *Lancet* series on undernutrition that brought the ANH discipline to more global prominence<sup>37</sup>, and the year of the food price crisis that brought food and agriculture issues (and some economic aspects of equity) to the fore of global development interest.<sup>38</sup> Although there was ANH research before this date, this was the date that the field took off

globally, and we expected far fewer studies (and therefore diminishing returns for additional searching and screening effort) going back further. This was, therefore, a pragmatic decision based on a logical date cutoff.

Searches were carried out on titles and abstracts of study reports, with the assumption that if ANH, equity, and LMIC concepts were central to a study, aspects of these would be mentioned in these summaries. There was no restriction by language (we had speakers of English, French, Spanish, Mandarin, and Arabic among the author group and were prepared to find translators for other languages).

### Screening and review process

All studies identified through the search process were exported to a bibliographic database (EndNote, version X8) for de-duplication and screening. One author (W.T.) undertook initial de-duplication using the built-in function of the EndNote software; other duplicates found during manual screening were also excluded and noted as duplicates.

To be included, study authors had to include in their analysis (not just in the background or policy recommendations) at least one aspect of agriculture, of nutrition or health, and of equity as defined in the conceptual framework, and must relate explicitly to LMICs. Two reviewers (D.Z. and a research assistant) independently examined the titles, abstracts, and keywords of the electronic records for eligibility according to inclusion criteria based on the conceptual framework (see [Table S2](#) in the Supporting Information online for full inclusion and exclusion criteria). The author group held several meetings over the course of the screening stage to check mutual understanding of the conceptual framework, refine and update the criteria, and discuss problematic articles or conceptual areas to improve inter-rater reliability and refine the conceptual framework as different types of studies emerged. Although no formal tests of inter-rater reliability were used, articles flagged to be included by one reviewer were then cross-checked by the other reviewer, with discussions based on the conceptual framework used to resolve discrepancies. Studies for which inclusion was uncertain during this initial screening were resolved by discussion with a third author (J.H.) and, where necessary, adjusting the conceptual framework to take on new concepts revealed through the screening in an iterative manner. Abstracts (and where clarification was required, full texts) went through a second layer of screening by another author (B.M.) during the more detailed process of mapping, to determine final inclusion in the review.

**Table 1 Conceptual framework and mapping criteria**

	Mapping criterion	Includes studies looking at/relating to:
Equity	Equity core	Core equity issues such as marginalization, disempowerment, or exclusion
	Inequalities	Disparities among different income groups, genders, ethnicities, disabilities, and ages
	Intersectionality	How any of the above issues of marginalization intersect or interact to produce additional layers of marginalization
	Capital and resources	Looking at differential access to resources or capacities such as land or water ownership or access, market access, educational or knowledge disparities, and other material, social, human, or natural capital
	Structural determinants	Looking at the structural determinants of marginalization such as social norms, political voice, the commercial context, power differentials in any of these, and the role of ideology or ideas in shaping inequity
Agriculture	Primary production (on-farm)	Production or harvesting of crops, livestock, fish, or any other foodstuff or agricultural product. Includes biofortified foods, and primary research and development work on seed optimization or breeding
	Value chains (off-farm)	Markets, trade, agribusiness, agricultural or food system employment, food processing and marketing, or any other intermediate steps between primary production and household/individual food access
	Food safety	The safety of foods in terms of either contamination or other foodborne hazards at any stage in the process from production to consumption
	Food security	Dimensions of food availability or access (eg, physical, economic, social) or the use of food, including consumer behavior in terms of the acquisition and preparation of food
	Environment	Food landscapes or ecosystems, including climate, and the broader food system environment, including food waste
Nutrition and health	Diets	Diet outcomes, such as nutrient content of the diet, diversity or quality of the diet, infant and young child feeding, or changes in diets over time
	Undernutrition	Undernutrition outcomes, including stunting, wasting, underweight, micronutrient deficiencies, or hunger, in any population
	Overnutrition	Overnutrition outcomes, including overweight, obesity, or noncommunicable chronic diseases such as diabetes and heart disease
	Clinical health	Human health outcomes, including communicable diseases, zoonotic disease, and mental health outcomes
	Occupational health	Occupational health issues, including heat exposure, pesticide exposure, and other health issues related to working in agriculture or food systems
	Environmental health	The natural and built environment affected by agriculture and relating to health, including antimicrobial resistance, and pollution and contamination from agriculture or food systems

## Mapping process

The mapping process, using NVIVO 12 software, was undertaken by a single author (B.M.) with support of other authors when articles were unclear, in a 2-stage process. In the first stage, abstracts for each of the included articles were imported into the software. Each abstract was read and methodological details used to complete a classification sheet with 10 equity options, 5 food and agriculture options, and 6 nutrition and health options (per [Appendix S2](#) in the Supporting Information online; [Table 1](#)). Each of these 21 options was either marked to denote that the aspect was addressed in the article, or left unmarked. The final 2 classifications were used to mark the discipline (determined by the journal to which the article had been submitted) and approach (determined by the description of methods).

The second stage was applied when abstracts were unclear on study methods and, therefore, on inclusion

criteria. These were flagged for possible exclusion (second screening) and sent to a second author (J.H.) for a final decision. When studies ultimately were deemed to meet the inclusion criteria after review and discussion, one author (B.M.) went back through the mapping stage for abstracts, with categories clarified by discussion between authors (B.M. and J.H.). At both stages of mapping, decisions were based on the title and abstract when the mapping categories were clear from these, and on the full text when they were not.

## RESULTS

Here we detail a stratified synthesis of the studies we found through this review. Note that in many studies, authors looked at more than one aspect of equity (or of ANH), so studies will appear in multiple categories and the number of studies seen in figures will not always sum simply to the total number of included studies.



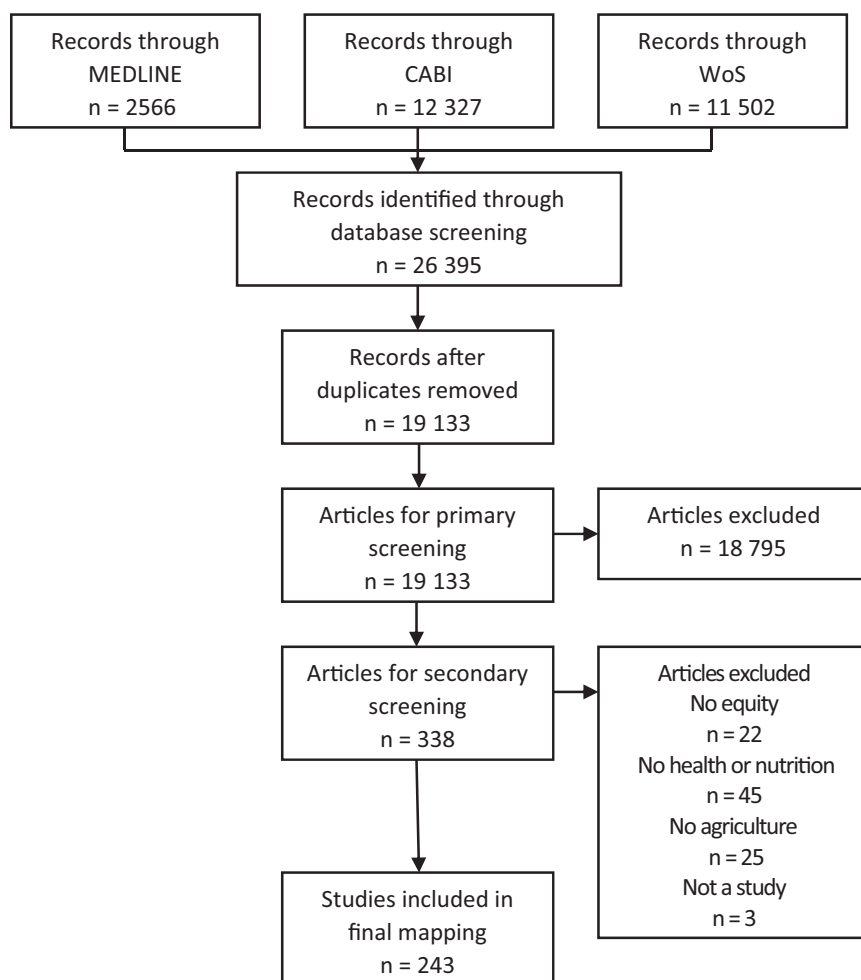


Figure 2 PRISMA flow diagram

## Descriptive results

A total of 26 395 potentially relevant articles were found through searches in 3 databases (Figure 2). After de-duplication and primary screening, 338 articles were deemed eligible for mapping. During the more comprehensive reading that came along with the mapping, an additional 95 studies were excluded because the articles were not clear enough on their approach or findings (in either the abstract or full text) that they could be clearly mapped within the remit of this review. A total of 243 studies were included in the final mapping. [Appendix S3](#) in the Supporting Information online provides the bibliography of included studies, and [Table S2](#) in the Supporting Information online lists the included studies and their constituent mapping (also available as searchable Endnote or Excel files on written request to the corresponding author).

Within food and agriculture, most studies looked at primary production on-farm ( $n = 209$ ), followed by food security ( $n = 45$ ), value chains off-farm ( $n = 33$ ), the

environment ( $n = 33$ ), and food safety ( $n = 12$ ). Within nutrition, a majority of studies looked at undernutrition in various forms ( $n = 100$ ), followed by diets ( $n = 69$ ) and very few on aspects of overnutrition ( $n = 6$ ). Within health, most studies covered aspects of clinical health ( $n = 87$ ) or occupational health ( $n = 83$ ) with few looking at aspects of environmental health ( $n = 10$ ).

Within equity, a majority of studies looked at the level of unequal outcomes among different groups ( $n = 207$ ). Within this level, most looked at gender ( $n = 89$ ), poverty ( $n = 72$ ), and age ( $n = 48$ ). Fewer looked explicitly at equity without specifying the pathway ( $n = 20$ ), and very few looked at disability ( $n = 15$ ), ethnicity ( $n = 8$ ), or explicitly at the intersection between different aspects of marginalization ( $n = 2$ ; looking at intersections among gender, poverty, and ethnicity in primary production and undernutrition, and at poverty, age, and geography in primary production and multiple aspects of nutrition and health). At the next level, many studies looked at the material circumstances that shape people's life chances ( $n = 160$ ).

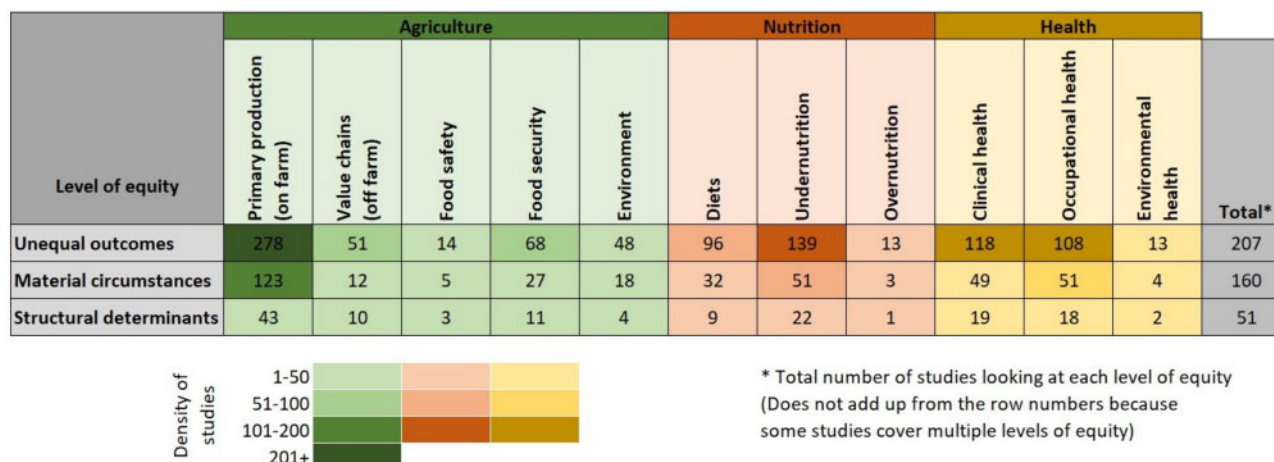


Figure 3 Synthesis of articles by equity and agriculture, nutrition and health topics

At the most fundamental level, fewer studies looked at the most basic structural determinants of equity ( $n = 51$ ).

### Synthesis by topic

Figure 3 illustrates our synthesis by topic and shows the numbers of included articles covering each ANH topic at the different levels of equity. Darker colors indicate more research covering the different equity levels within each of the ANH topics.

Within agriculture, most studies were focused on primary production (on-farm), and of these, the main areas of equity focus were unequal outcomes (largely gender, poverty, geography, age), then material circumstances, and then structural determinants. Within value chains, food security, and environment work, the major focus was on unequal outcomes (particularly poverty, geography, and gender) and material circumstances. Food safety literature comprised fewer articles and focused on material circumstances and gender.

Within nutrition, most studies looked at undernutrition or diets, and for both of these, unequal outcomes (ie, poverty, gender, and geography, with fewer looking at age) were assessed in most studies, followed by material circumstances. For undernutrition, and less so diets, authors of several papers also looked at the structural determinants. Of the few overnutrition studies, unequal outcomes (ie, poverty, geography, and age), and material circumstances were the topics most assessed.

Within clinical and occupational health, unequal outcomes (ie, gender, geography, age, and poverty) were the most assessed topics, followed by material circumstances, and then structural determinants. Of the few environmental health studies, most looked at unequal

outcomes (by geography and poverty); few looked at material circumstances or structural determinants.

Of the different levels of equity mapped according to our conceptual framework, a majority of studies looked at unequal outcomes stratified by personal characteristics. At the next level, fewer studies looked at material circumstances making up human capital and resources within each subtopic under agriculture, nutrition, or health. At the next level, a small number of studies looked at the structural determinants of inequity such as social norms and values. This pattern—unequal outcomes > material circumstances > structural determinants—held for each subtopic of ANH.

### SYNTHESIS OVER TIME

Between the review start and end dates (2008–2019), the number of studies in which authors looked at any aspect of equity in ANH research increased steadily, from <10 studies in 2008 to >45 in 2018 (numbers in red in Figure 4). These numbers, however, are a fraction of the total number of studies undertaken in ANH research over this time, suggesting equity has not been a core focus of the field.

Beyond total numbers, a synthesis by year showed that most ANH work has continued to focus on unequal outcomes (particularly by gender, geography, and poverty); material circumstances have remained a key focus of ANH-equity work over time; and structural determinants of equity have been researched to a far lesser extent. The number of studies addressing these topics has increased, and the proportions among the equity levels have remained similar. The topics of ethnicity, disability, age, and intersectionality have been consistent in their low level of representation in the ANH-equity literature.

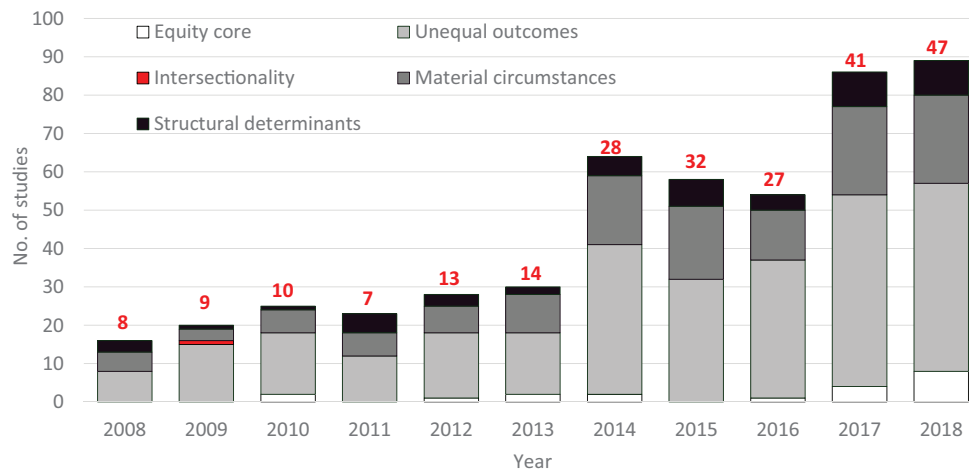


Figure 4 Annual trend in publications by equity

## SYNTHESIS BY DISCIPLINE AND APPROACH

Although the originating discipline could not be identified for a third of the articles on the basis of their abstract or the publishing journal, Figure 5 shows that a majority of identified articles originated in the fields of epidemiology (27% of articles) and development studies (18%), followed by economics and interdisciplinary research (9% each). Only 3% of articles originated in the field of agronomy, and only 1 article was from the field of demography, according to the metrics we were able to generate. The proportions of studies in which researchers looked at the different levels of equity were similar between disciplines, with work addressing unequal outcomes most common, followed by material circumstances, followed by structural determinants.

In terms of approach to analyzing ANH-equity issues in the literature, most authors used primary data collection methods (60% of studies), followed by secondary data analysis of existing data (19%) and theoretical analysis (7%). Mixed methods were applied in 1% of studies, with 13% of articles unclear about the study's methodological approach. Among these approaches was a range of uses of equity concepts, from basic comparison of different groups (eg, men and women) in statistical analyses, to detailed ethnography assessing structural inequities in people's lives.

Our metrics of discipline and approach were limited but show that epidemiology and development studies disciplines have engaged most with issues of equity in their research, and that most used primary data (qualitative and quantitative) to undertake research. The full mapping of all articles (Table S3 in the Supporting Information online) does not highlight any particular patterns in terms of which disciplines or approaches, among the included studies, were most applied to different kinds of equity work in ANH research;

many different disciplinary backgrounds and different approaches have been applied to all ANH and equity topics and levels. Looking at the full mapping in Table S3, it is also not possible to determine meaningful patterns in how equity is addressed in smaller subcategories of ANH research (eg, in studies looking at undernutrition outcomes of primary production or clinical health outcomes of food safety).

## DISCUSSION

In this scoping review, we aimed to understand the range of ways that ANH research has addressed equity issues among disciplines and over time. We identified a range of conceptualizations of equity used (implicitly or explicitly) across this research, which framed the different approaches from different epistemological standpoints. For the purposes of mapping studies, we defined these approaches to equity at three levels, from analyzing the aspects of marginalization that explain unequal outcomes, to the material circumstances (including capital and resources) that shape people's life chances, to the structural determinants such as norms and values that configure why and how certain groups become socially, politically, or economically marginalized in the first place. These levels map broadly to established frameworks, such as the Commission on the Social Determinants of Health,<sup>39</sup> which speaks to disparities in outcomes, intermediary and material determinants, and deeper structural determinants of health inequities.

We found that a majority of studies focused on the first of these levels, describing how nutrition and health outcomes differ for different groups who may be marginalized or differentially affected by food system or agricultural activities, such as men and women, rich and poor, or different locations (eg, rural, urban). Looking



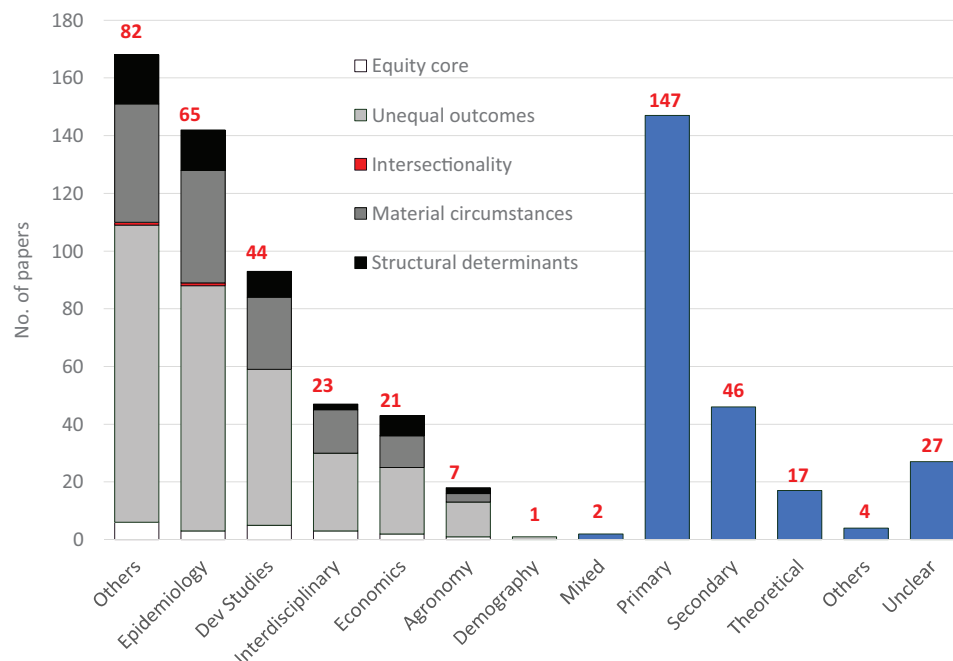


Figure 5 Disciplines and approaches studying equity in research on agriculture, nutrition and health

at the particular aspects of equity at this level that are covered in the literature, the same aspects remain the least studied over time (including ethnicity, disability, and age) despite their centrality to understanding engagement in agriculture and food systems.<sup>40–42</sup> In very few of these studies ( $n = 2$ , in fact) did researchers look explicitly at how these different aspects of marginalization might interact. The lack of articles in which researchers reported looking at the intersection of multiple descriptors of the personal characteristics associated with inequity is a limitation of the ANH literature, because we know that these different aspects act together in shaping disparities in outcomes, in a process often described as intersectionality.<sup>43,44</sup> Established methods and approaches<sup>45</sup> need to be refined or applied in ANH research to allow a better understanding of how these complex interactions play out for different issues in different contexts.

A number of studies went to the next level, looking at the material circumstances, capacities, and resources that shape people's life chances. This kind of work is often grounded in welfare economic traditions, relating to equal life chances or equality of opportunity through the distribution of capital, goods, and access to services<sup>45</sup>; or looking at distributive justice, which is concerned with how costs and rewards are shared across society.<sup>18</sup> Much of this work is focused on income or household assets,<sup>47</sup> or on human and social capital,<sup>48</sup> as a proxy for material circumstances. Specific tools exist to study aspects of material circumstances in ANH research, including the Women's Empowerment in

Agriculture Index, which combines a focus on gender and assets.<sup>49,50</sup> ANH work needs to continue to go beyond income to understand the complexities of the capital and resources available to people in shaping their nutrition and health outcomes.

Fewer studies in our review looked at the most fundamental structural determinants of inequity, such as how norms and values or governance and institutions shape social or political marginalization. In literature related to the ANH field, work on the social determinants of health is fairly well established,<sup>51</sup> whereas work on the social determinants of nutrition is still largely at the conceptual stage,<sup>51</sup> though with some notable exceptions.<sup>53</sup> Much of this work has a foundation in qualitative social and political sciences and anthropological traditions, which allow for a holistic view of lives and livelihoods. Structural inequities exist not only in economic domains but also in political, social, cultural, environmental, spatial, and knowledge dimensions.<sup>54</sup> In each of these domains, power disparities play out in different levels, spaces, and forms to shape people's ability to engage with the structures that shape their world—and can be studied.<sup>55</sup> Frameworks such as the Reach-Benefit-Empower framework,<sup>56</sup> originally created to understand how agricultural development projects affect women, could certainly be adapted to understand how ANH projects and changes are affecting different marginalized groups and to what extent they are working on structural empowerment. Although it would be difficult to address all aspects of structural inequity in a single study, the ANH field as a whole does need to

work toward a better understanding of these structural issues to frame sustainable change.

There are examples of each level of equity being researched within agriculture, or nutrition, or health research, but more is clearly needed in the combined field of ANH. The number of studies addressing any aspect of equity in ANH research has increased steadily over time, but given the number of studies being undertaken in the ANH field over the last decade (a basic Scholar search found >3000 ANH articles for the same period as this review), the total number found to explicitly incorporate any equity considerations within the core analysis (and clearly enough that they could be identified as focusing on equity issues) is small. Concepts of equity are vital in understanding and addressing poor nutrition and health outcomes,<sup>52</sup> including through agriculture and food systems, so more (if not most) ANH work should be incorporating some notion of equity into analysis, using the methods and approaches with which particular researchers are most comfortable.

## RESEARCH RECOMMENDATIONS

This review is intended to be a first step in identifying relevant literature and building a research agenda for assessing, understanding, and acting upon inequity in agriculture and food systems as they relate to health and nutrition. Clearly, research on equity in ANH has largely been concerned with describing the problem in terms of which groups might have poorer outcomes in different contexts as a result of known characteristics of marginalization, rather than analyzing why these disparities exist at more fundamental levels.

The same pattern was repeated within each discipline identified as undertaking research in this area, with the structural determinants represented least in each discipline, material circumstances and unequal outcomes represented more, and intersectionality barely at all. Although it is important to see that researchers used primary data in most studies, it is notable that there were very few theoretical studies in this area, and the lack of theory or frameworks is perhaps limiting the ability of those conducting empirical studies to find ways to study equity. This review, and the theoretical studies we identified in it, can go some way to pointing researchers toward ideas and important issues to address. Researchers can also draw on theory from other disciplines, such as development studies,<sup>57</sup> or studies within the ANH subdisciplines,<sup>13,14,39,58</sup> to find equity directions to research. In taking forward an agenda on equity in ANH research, it would be wise not to ignore the epistemological divide separating different groups of ANH-equity researchers. Some will be comfortable disaggregating data by aspects of marginalization;

others will want to go deeper to understand how the structural social, economic, and political determinants interact with food and agriculture systems to create nutrition and health outcomes differently for different groups in different contexts. A live and let live approach, with some willing to cross-fertilize ideas among different groups of researchers, will likely make for the richest contribution.

The clearest gap in research is at the level of understanding these structural determinants of inequity, including the role of norms and values, political voice, or commercial contexts in shaping marginalization through food and agriculture systems, and the impact of injustices in governance, institutions, or societies. Work connecting who is marginalized (from fair outcomes, or from just processes of engagement to shape those outcomes) with why they are marginalized in their particular context is important in shaping responses. Existing work and methods in the fields of anthropology, political economy, and broader social sciences can be used to understand which groups are known to be marginalized in different contexts and the reasons why. Much of this understanding already exists outside of the narrow ANH field and can be built upon so that ANH research no longer needs to describe the issue and can focus on understanding how and why these groups are marginalized in different contexts, and on testing contextualized social and policy responses to address inequity in agriculture and food systems.

For those more comfortable with using descriptors of marginalization to structure quantitative analyses, theories and tools also exist. Though researchers will first have to understand which aspects of marginalization might be most relevant in the context of their particular research, systematic use of equity characteristics such as the PROGRESS-Plus list<sup>59</sup> would ensure that most potential axes of marginalization are considered. Researchers should be encouraged to assess the interaction of different axes of marginalization and their impacts on outcomes, because this is a clear gap in the literature.

It is also worth noting that work done in the fields of agriculture and equity, nutrition and equity, and health and equity alone would not be captured by this review, but a broader review of equity-focused literature in these areas would also help researchers better frame or address equity in future ANH-equity research. Frameworks are available for understanding the breadth the social, political, and economic determinants of health<sup>32</sup> and, more recently, food systems for healthy diets<sup>60</sup> and nutrition.<sup>12</sup> Integrating these considerations more centrally into currently accepted food systems understandings such as the High Level Panel of Experts<sup>34</sup> framework would help move forward work on equity in ANH research.

We hope more work will be undertaken by taking the literature identified in this review and looking in more depth at particular aspects that interest different researchers so knowledge gaps might be filled. Researchers and research funders should note that identifying a gap does not mean it is necessarily a priority to fill it; similarly, the lack of an identified gap does not mean that no additional research is needed. Rather, proper engagement with the identified literature, in light of accepted frameworks and priorities, should shape a research agenda that fills strategic gaps so food system equity can be advanced.

## STUDY LIMITATIONS AND REFLECTIONS

Scoping reviews are inherently limited by the sheer volume of material they generate. We did not have the resources to read the full text of each of the articles found through targeted searches, so we focused on the titles and abstracts. Our rationale was that articles reporting on studies with an inherent focus on equity in their analyses (not just in conclusions or recommendations) would mention it in the abstract (and our inclusion criteria were kept intentionally broad to pick up a range of ways of talking indirectly about equity), but, of course, this strategy would miss articles on studies that did discuss issues of equity, and would be useful additions to the ANH equity literature, but did not focus on them as a primary element of the research.

The aim of a scoping review is to capture a broad view of the literature in a given area. As such, we tried to be as broad as possible in this review in terms of searching and inclusion criteria, but this left us with a very broad range of different types of evidence, which was harder to synthesize than a single-discipline set would have been. Early on in the review, it was acknowledged that assessing material that cuts across disciplinary boundaries heightens the difficulties of reviewing scholarship that reflects divergent research orthodoxies and epistemologies. Having a multidisciplinary team of authors and advisors (from political science to anthropology to public health) was helpful in mitigating this issue for the review. Such a team does not solve the problem for the ANH community more broadly, however, where researchers may be missing key pieces of relevant research on ANH-equity because they fall outside of individuals' accepted disciplinary purview. A potential next step could be to map the sets of authors working on ANH-equity issues in the studies identified here, to better understand the communities of researchers working in this area.

Although we were guided by detailed and explicit guidance to ensure that the selected studies reflected a set standard, our own understanding of equity meant

there was often a challenge of having criteria that were initially too narrowly defined. We found an iterative process and team meetings to update the original research framework was helpful in addressing common concerns on how multidisciplinary teams and approaches can work together. We met several times during the course of the review, which facilitated discussions about challenges and confusion, and enriched the final framework and synthesis.

Exclusion criteria that were less clear in the screening exercise included the decision not to incorporate studies that solely took place within a rural or farming context without researching agriculture as a sector or livelihood explicitly; the analysis itself had to be explicitly linked to agriculture. For several works, particularly those drawing on anthropological traditions of research, broader discussions of equity and structural realities informing the well-being of communities addressed important conditions shaping inequity but were removed from the review because the analysis (whether empirical or theoretical) was not clearly focused on food systems or agriculture. Other works that were excluded on the same grounds were studies in which authors addressed the impacts of agricultural pollution on urban populations.

Similarly, where it was clear that a study was relevant and included analysis combining ANH and equity, the process of mapping to defined and discrete categories was also sometimes problematic. Examples included finding that HIV/AIDS was in some instances analyzed as an equity issue (marginalizing or limiting those living with the disease) rather than as a health outcome (with other health or nutrition outcomes included in the analysis of impact instead). Similarly, climate was an explicit inclusion criterion in the review and appeared in the mapping both as an aspect of agriculture (under *environment* in the food and agriculture category) and as a structural aspect of equity (determining negative impacts on certain groups, depending on their exposure to climate change) depending on how the construct of *climate* was used in the particular article under review. Similarly, aspects of agriculture, such as land tenure, were sometimes analyzed as an equity issue rather than as a food or agriculture issue (with other food or agriculture variables allowing the studies's inclusion in the review). In cases where these concepts were used as equity issues rather than inputs or outcomes, we mapped HIV as *disability*, climate as *structural determinant*, and land tenure as *material circumstances*, but this was not always entirely satisfactory.

Working across disciplines comes with its own set of challenges and entailed covering a wide array of journals and, therefore, having to accept that peer review

and publishing standards in one field may not consistently comply with another. Although scoping reviews are expected to be systematic and to present data in a structured manner, overlooking this disciplinary hybridity also entailed having no clear standard measure for quality across the works reviewed; thus, in this review, no attempt was made to assess study quality, and the full range of studies was included.

## CONCLUSIONS

In this review, we systematically synthesized a set of literature broadly relating to equity in the field of ANH research. The review is a step in the direction of understanding how researchers are researching equity through different traditions and over time, and the ultimate aim is to apply this work to responses to addressing inequity in agriculture and food systems for better nutrition and health.

In this review, most studies looked at what the inequity problem is; fewer looked at how this inequity is shaped, and fewer still looked at why the inequity exists in the first place. Given the role inequity plays in holding back progress on a whole range of outcomes, understanding and addressing it at multiple levels should be encouraged as a fundamental aspect of most future ANH research. If we do not attempt to understand and address the social, economic, political, and commercial structures that underpin inequity, food and agricultural systems will be left to reproduce the same nutrition and health outcomes, and the same groups will continue to be left behind.

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**Author contributions:** J.H. conceived the review; all authors provided input into framing the topic and clarifying the search and inclusion criteria from their different disciplinary perspectives. W.T. performed the literature searches and organized the resulting literature. D.Z. and a research assistant screened the literature for inclusion. B.M. mapped the included studies through a second round of screening, in consultation with J.H.. All authors contributed to the interpretation of findings and the writing of the manuscript.

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**Declaration of interest.** The authors have no relevant interests to declare.

## Supporting Information

The following Supporting Information is available through the online version of this article at the publisher's website.

[Appendix S1 Search terms](#)

[Appendix S2 Conceptual framework and mapping criteria](#)

[Appendix S3 Bibliography of included studies](#)

[Table S1 Full search strategy for MEDLINE database](#)

[Table S2 Inclusion and exclusion criteria](#)

[Table S3 Full table of included studies, mapped](#)

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