

Methodological Limitations of Pandemic Data Collection: Where Do We Go From Here?



Nilupa S. Gunaratna, Madeline Q. Powers, Morgan Boncyk, Ramya Ambikapathi
Department of Public Health, Purdue University, USA



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Background

- Shocks can worsen food security, diets, and nutrition inequities
 - Data are needed rapidly to inform mitigation and response
 - The COVID-19 pandemic spurred numerous studies, and risk of infection and urgency led many to use new methods for **sampling** and **data collection**
- What are the strengths and limitations of these methods?



Objective

To evaluate the methodological strengths and limitations of studies on food security during the COVID-19 pandemic, particularly by examining their **sampling methods, data collection approaches**, and analysis and reporting of **disaggregated outcomes**.

Methods: Comprehensive Review

Google Scholar Search

- Peer-reviewed and grey literature
- Published between March 2020 to July 2021
- Search String: food security “COVID-19”

Exclusion Criteria

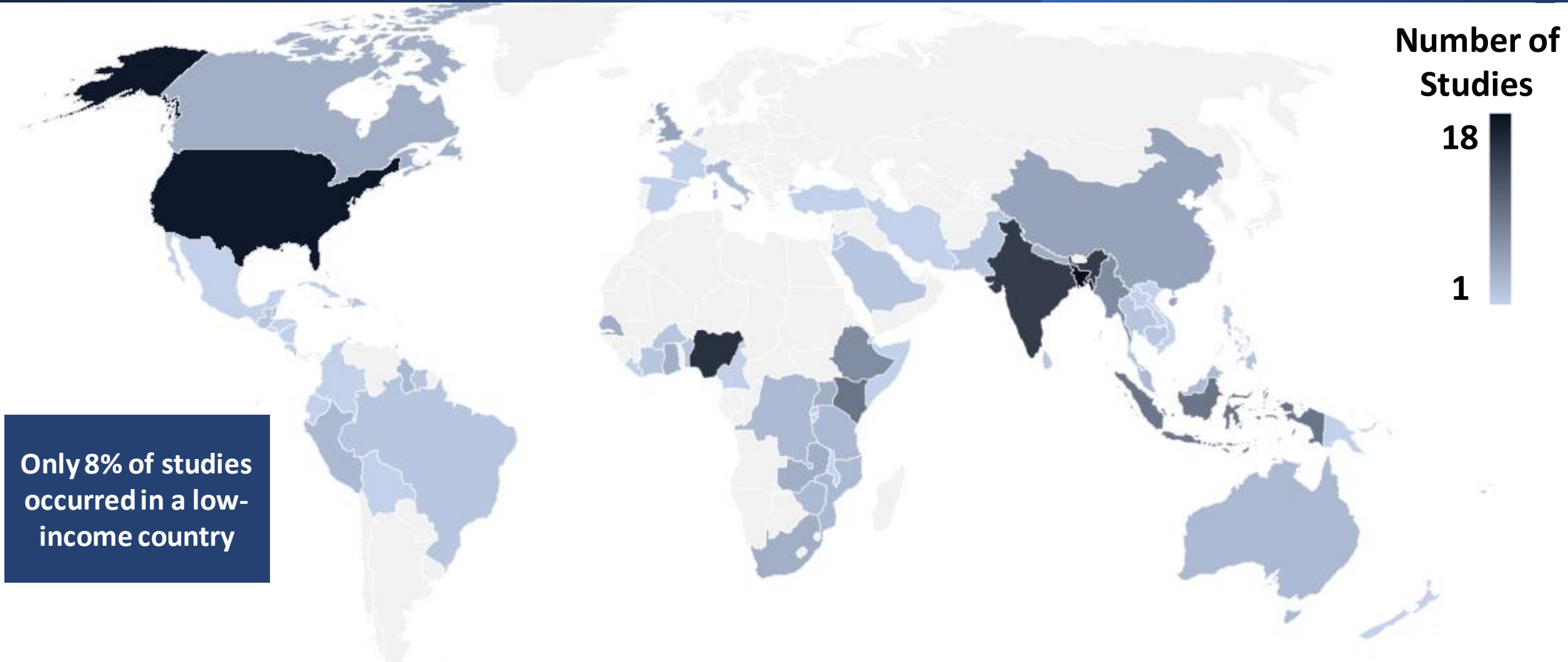
- Did not report outcomes related to diet, food security, or food systems
- Did not provide at least an abstract or summary in English
- Inaccessible link

Types of Data Extracted

- Geographical locations
- Study population
- Sampling methods
- Data collection timing and methods
- Reported outcomes and disaggregation of results



216 studies across 92 countries



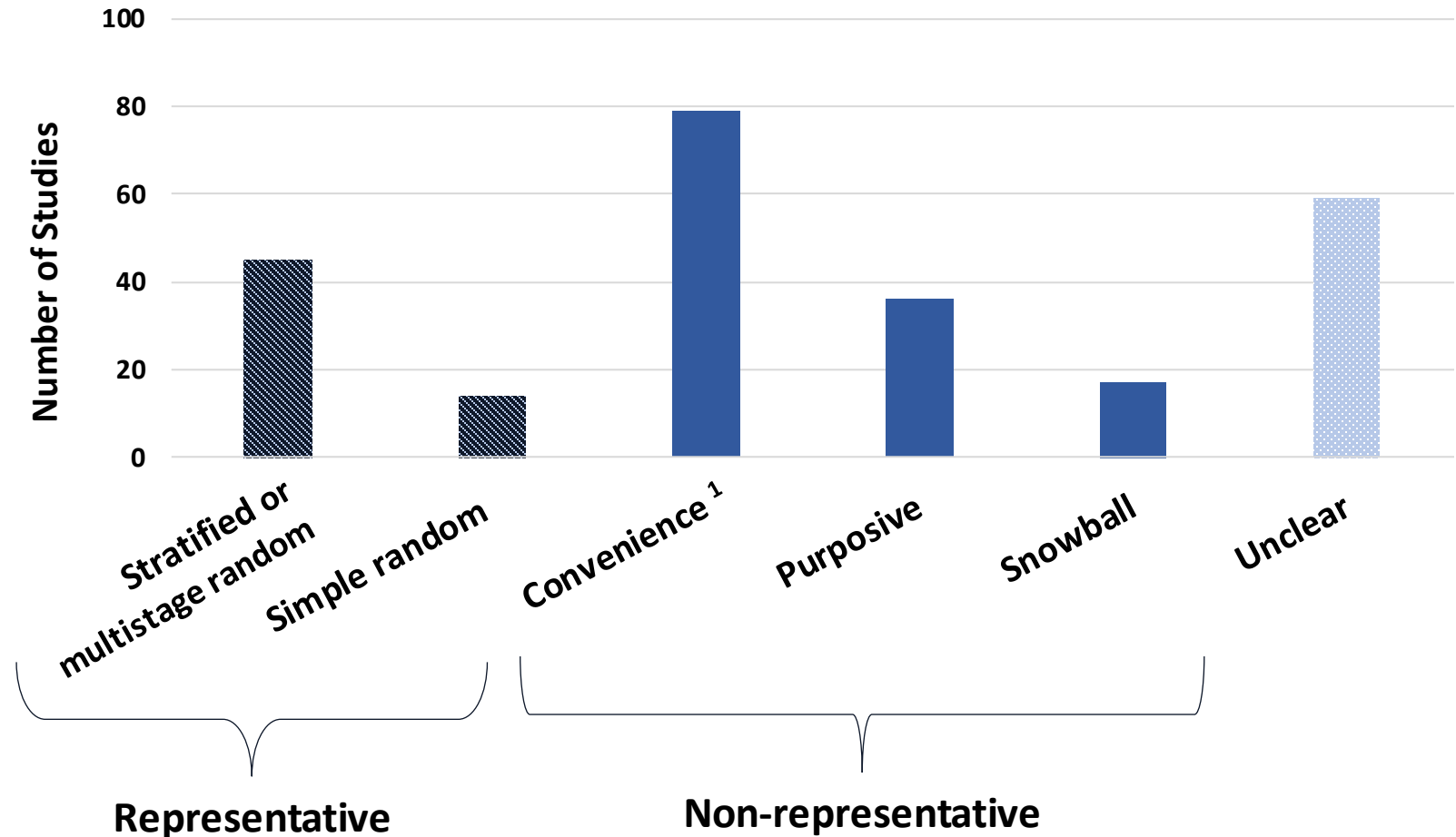
Only 8% of studies occurred in a low-income country

Number of Studies
18
1

Note: the color scale on this map does not include the United States, which had 62 studies

Sampling Methods

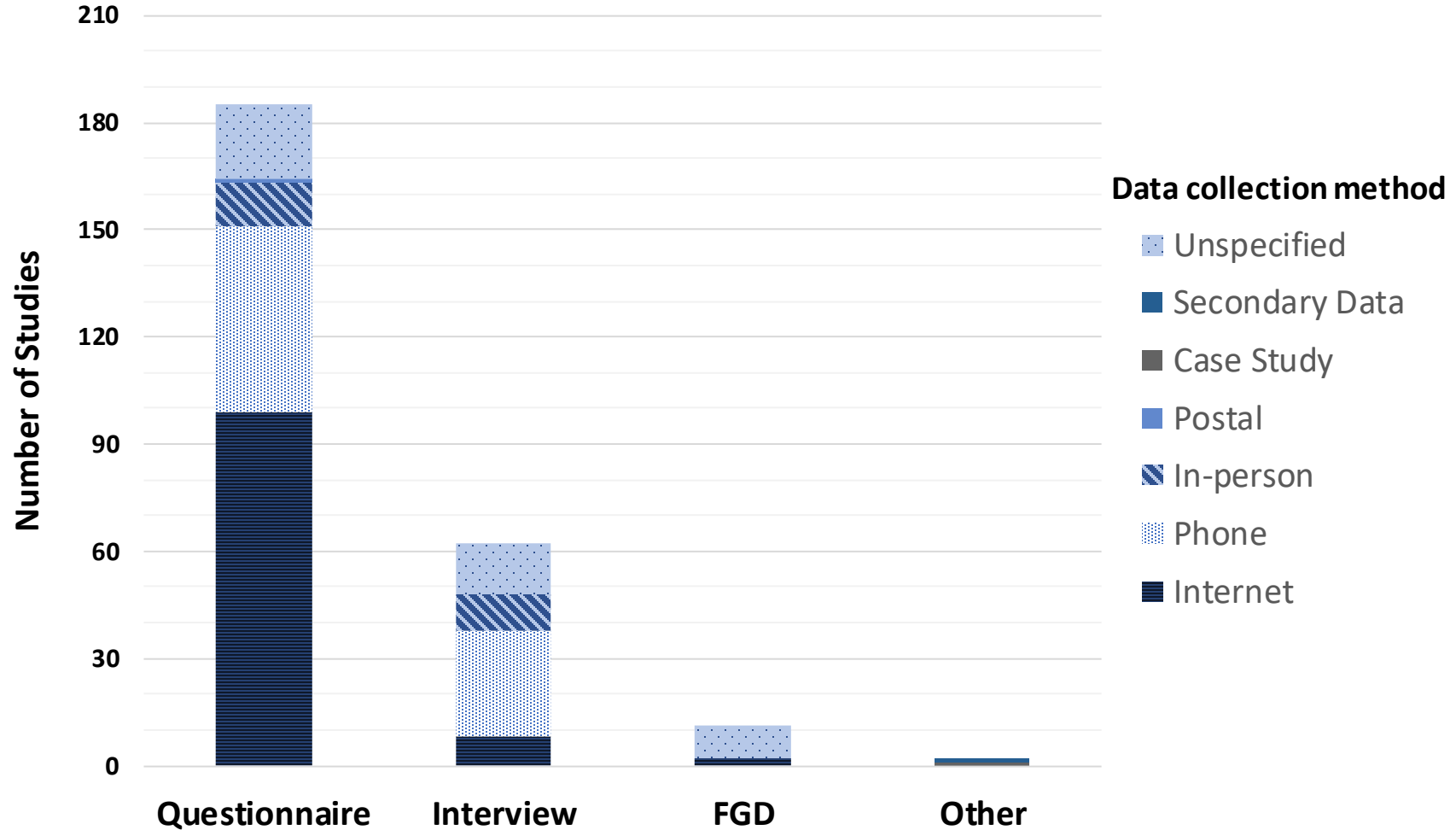
- Only **26%** of studies used **random sampling** methods
- **8%** used snowball sampling and **38%** used other **convenience** sampling methods
- **29%** were **unclear** in their sampling method
- **19%** relied on a **sampling frame** from an **existing** study



Categories are not mutually exclusive
¹ Convenience sample other than snowball

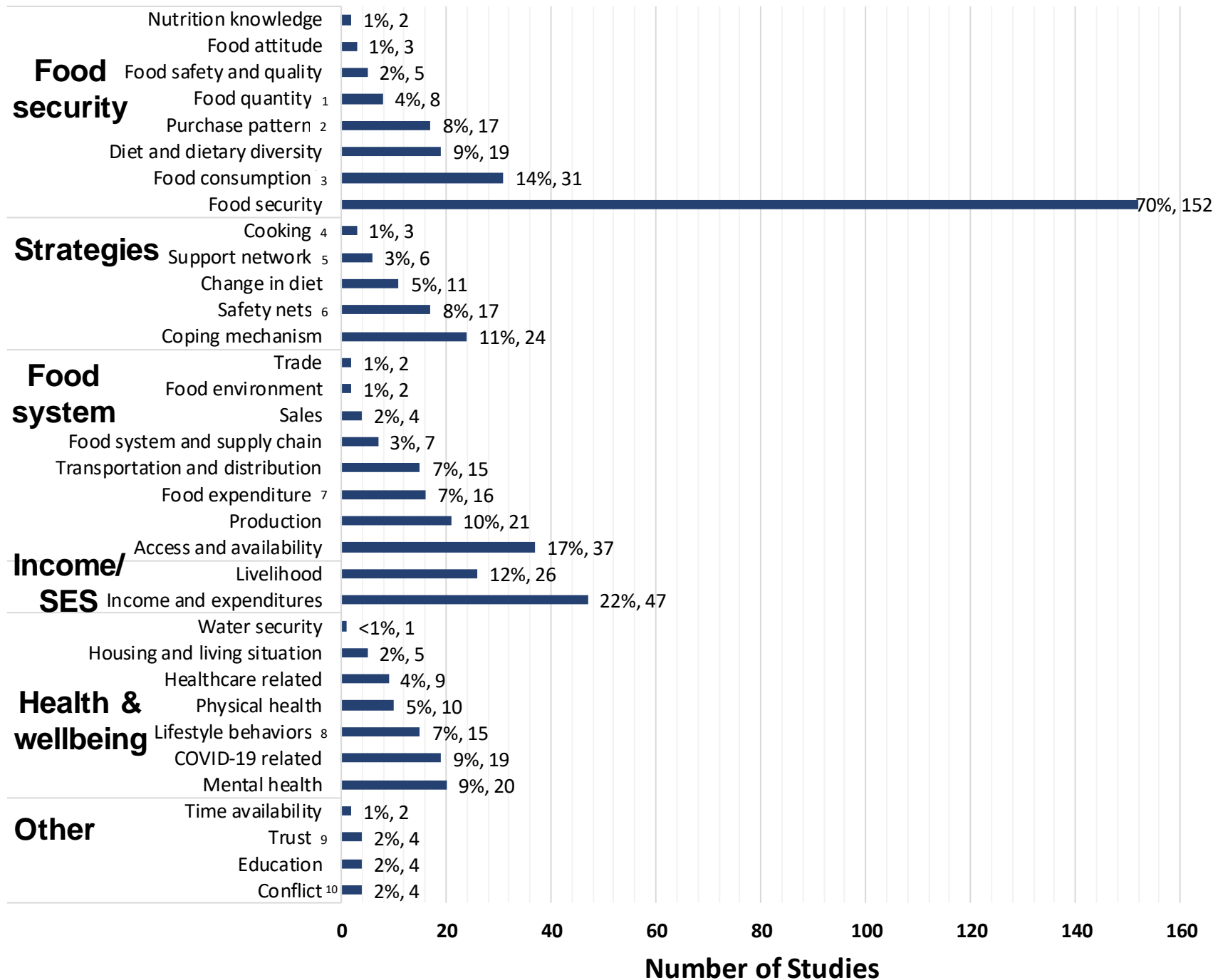
Data Collection Methods

- **74%** of studies used **remote** data collection
- **26%** included **qualitative** data
- 17% included more than one **time point**
- 15% reported **response rate**
- **Sample sizes** ranged from **3 to 413,976** participants (median 680)



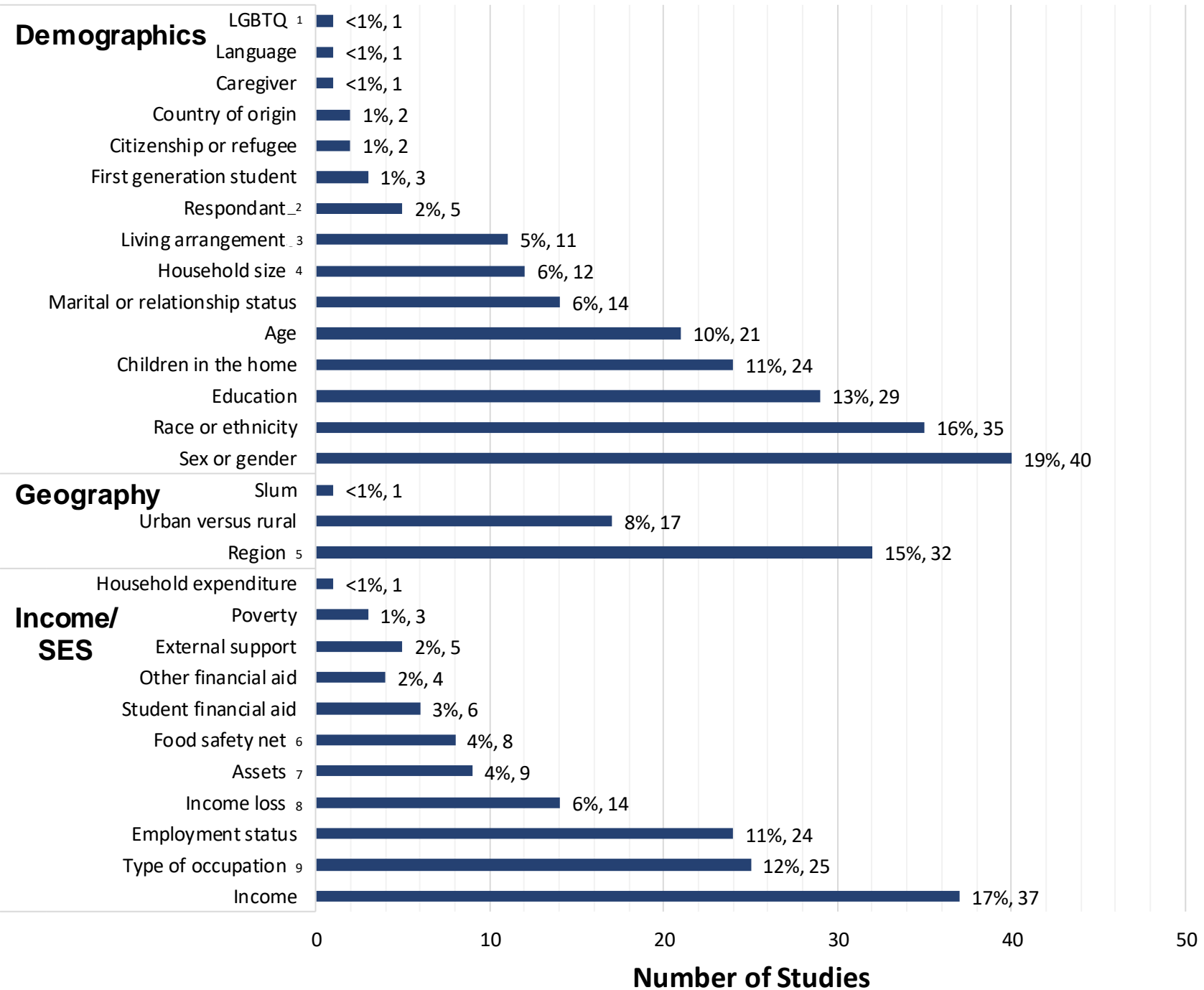
Categories are not mutually exclusive; FGD = focus group discussion

Outcomes



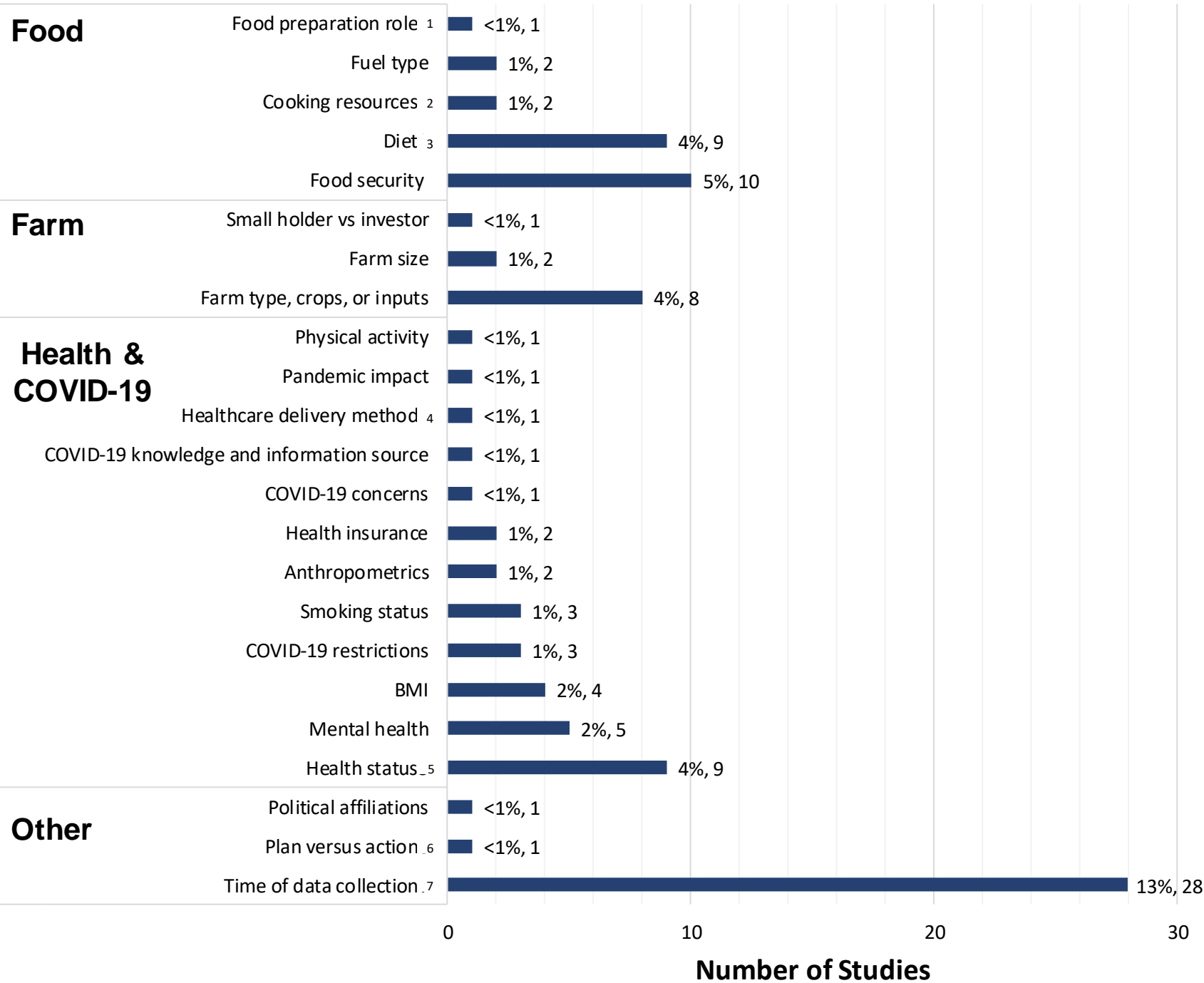
¹ Food quantity (amount) includes studies on food sufficiency, hunger, meal size, malnutrition, and meeting food requirements; ² Food purchase and acquisition patterns, such as sources, shopping habits, stockpiling, food waste, and food decisions; ³ Food consumption includes energy patterns, feeding practices, food frequency questionnaires, and food intake; ⁴ Cooking indicates cooking at home vs eating out, cooking fuels, and type of cooking; ⁵ Support networks include social protection and informal food safety nets, which includes access to services; ⁶ Formal food safety nets include food support from food pantries, food banks, and school meal assistance; ⁷ Food expenditure includes both food prices and affordability; ⁸ Lifestyle behaviors include health behaviors, food and lifestyle habits (including nutrition and snacking), and health outcomes; ⁹ Trust in the government and food industry; ¹⁰ Conflict includes intimate partner violence, child discipline, and personal safety.

Disaggregation of Outcomes



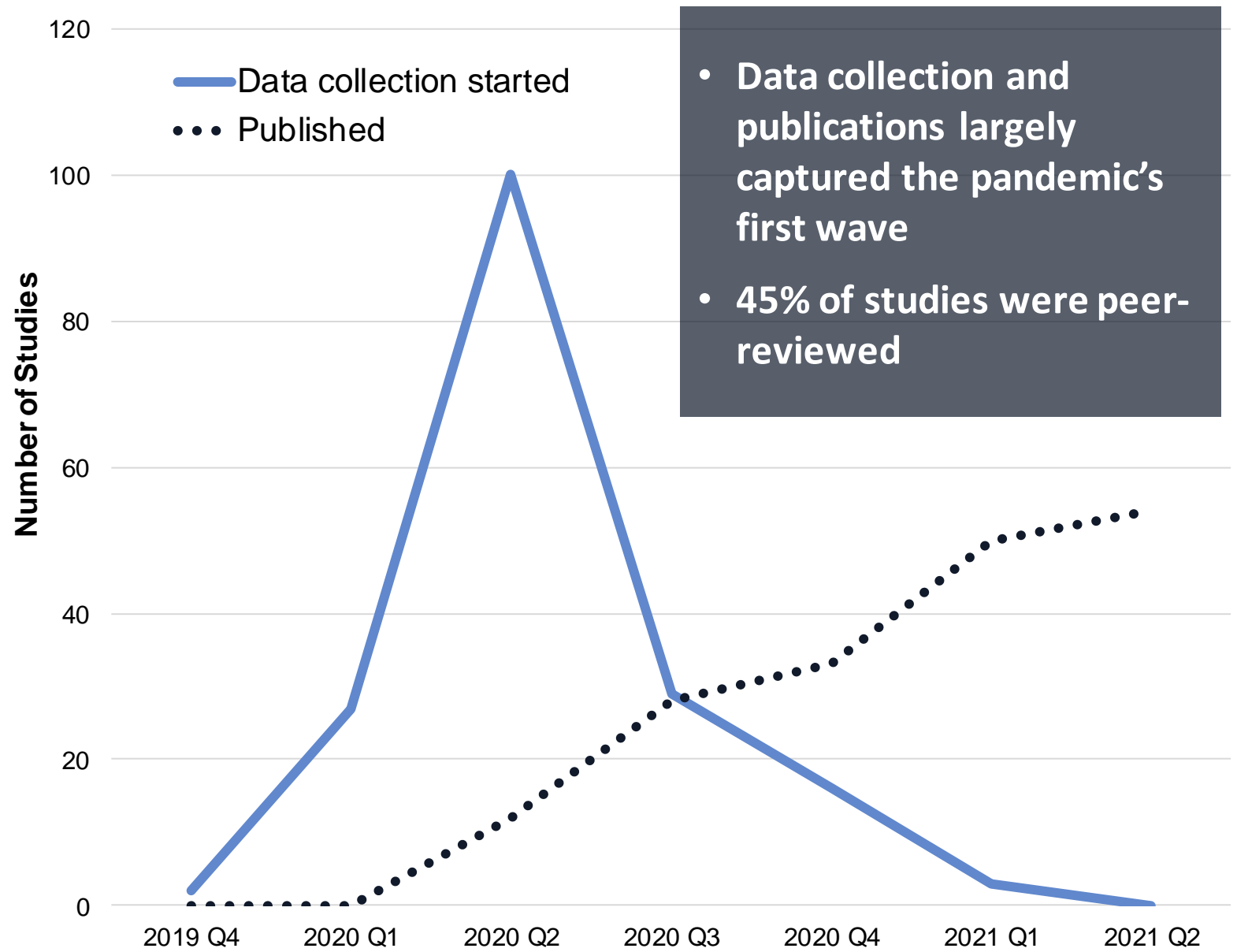
¹ LGBTQ = lesbian, gay, bisexual, trans, queer/questioning, with the plus sign signifying a desire to be inclusive; ² Respondent indicates disaggregation by parent vs child, household head versus other household member, field worker; ³ Living arrangement includes residence, crowding, living with college students, as a couple, or alone; ⁴ Household size includes household composition; ⁵ Region is a location in general, country, or district; ⁶ Food safety nets include forms of food aid, such as SNAP and school lunches; ⁷ Assets includes home ownership and SES; ⁸ Income loss or job disruption from COVID-19; ⁹ Type of occupation includes student and livelihood.

Disaggregation of Outcomes

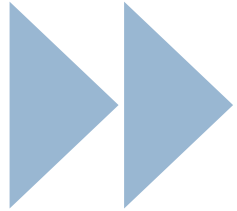


¹ Food preparation role consists of food purchaser or cooker; ² Cooking resources indicates one has the material ability to prepare food; ³ Diet includes food type and nutrient intake; ⁴ Healthcare delivery method includes the type of care (e.g., clinic versus outreach); ⁵ Health status includes health conditions, such as disability and pregnancy; ⁶ Plan versus action is if the action is a current coping mechanism or future strategy at the time of data collection; ⁷ Time of data collection, or by survey round, includes before and after the COVID-19 pandemic.

Data Collection & Publication Times



Conclusions

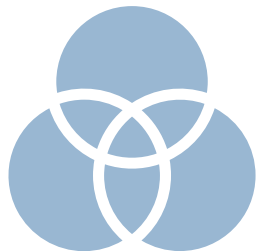


COVID-19 pandemic accelerated movement towards remote data collection



Non-representative samples have significant **limitations**

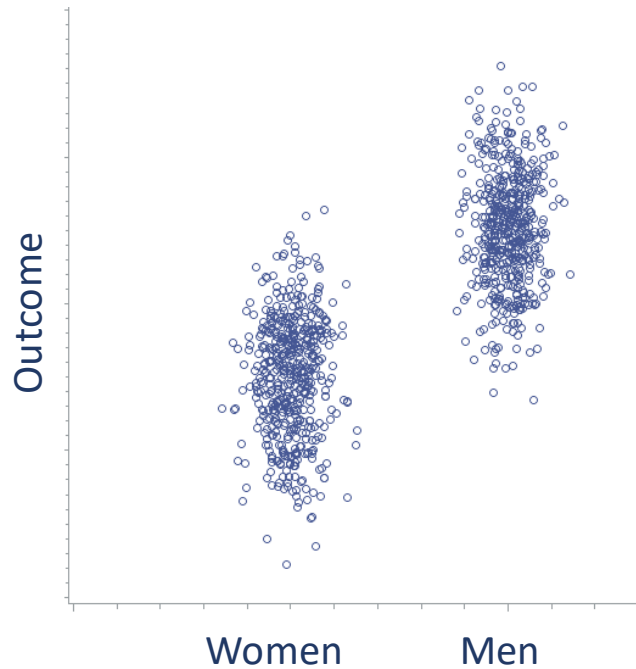
- Excluding the most vulnerable
- Creating biased estimates
- Limiting generalizability of findings for evidence-based decision-making



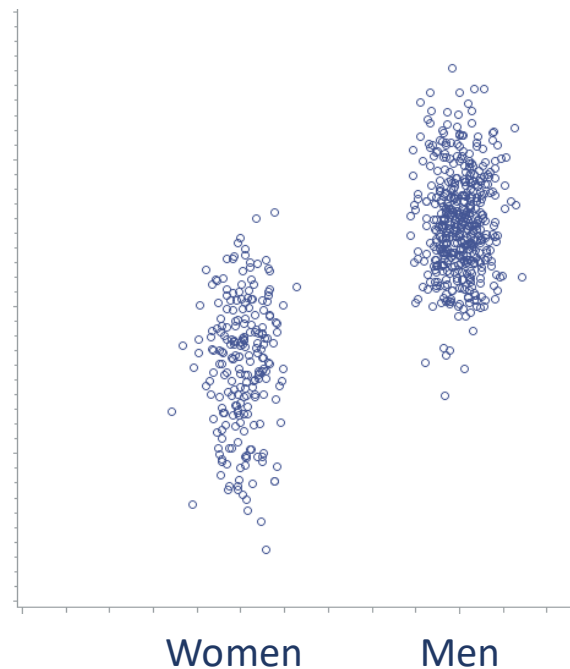
Limited disaggregation of reported findings makes it **difficult to identify inequities**

Simulated Example: Outcome Related to Sampling and Data Collection Methods

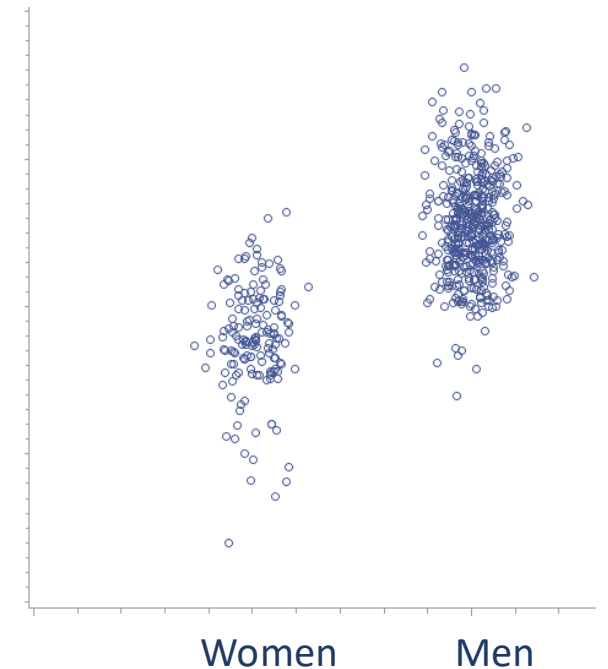
Representative sample



Individuals with low outcomes less likely to be sampled



Individuals with low outcomes less likely to be sampled and women with very low outcomes even more unlikely to be sampled



Estimated Means

Women: 25.0
Men: 35.1
Disparity: 10.1

Women: 26.1 ↗
Men: 35.6 ↗
Disparity: 9.5 ↘

Women: 27.9 ↗
Men: 35.6 ↗
Disparity: 7.7 ↘

Further Ethical Questions

- Is there oversight from an institutional review board (IRB) or similar body?
- Is informed consent done?
- How is privacy assured?
- Who owns the data?
- Are we adequately engaging with target individuals and populations, including when disseminating results?
- Are we creating *research inequities*?

Rapid data are critical during shocks and crises...

...however, compromising methodological rigor has costs.

Where Do We Go From Here?

Researchers

- Develop methods to ensure representative samples and reduce bias
- Clearly state methods
- Conduct longitudinal studies to assess ongoing and long-term effects
- Report disaggregated results
- Clearly communicate limitations of inference when disseminating results

Scientific Journals

- Require clearer, more complete statement of methods and presentation of disaggregated results

Questions?



gunaratna@purdue.edu



[@NilupaGunaratna](https://twitter.com/NilupaGunaratna)