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Reimagining global health scholarship to tackle health inequities

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1. Introduction

The world, by several measures, is a healthier place to live than it has ever been. Many health indicators are improving across countries and global life expectancy has generally been increasing, with the exception of the recent decline due to the Covid-19 pandemic (Cao et al.; Schumacher et al., 2024). However, even as overall health has improved, significant health inequities—systematic and often avoidable differences in health outcomes—between and within countries persist. There is ample evidence documenting health inequities between countries. More than six million children still die before their fifth birthday each year, with four out of five of those deaths occurring in sub-Saharan Africa and Southern Asia. (Healthy Lives and Well) Inequities within countries also continue to hinder global population health progress. For example, despite overall advancements in many health indicators in Brazil for around three decades, regional inequities persist, potentially limiting Brazil's ability to meet the 2030 Sustainable Development Goals (SDGs) (Machado et al., 2020). Such inequities are not just a phenomenon of low- and middle-income countries (LMICs) but have always been present, and sometimes growing, in high-income countries (HICs). The recent US life expectancy decline disproportionately affected racial and ethnic minorities (What is Driving Widening Racial, 2023). In Japan, while overall life expectancy grew between 1990 and 2015, the disparity between the highest and lowest-performing provinces widened from 2.5 to 3.1 years (Kanchanachitra & Tangcharoensathien, 2017).

It is thus not surprising that there is a movement emerging to refocus global health on health inequities among the global population, both within and between countries (Abdalla, Maani, et al., 2020; Chen et al., 2020; Jensen et al., 2021; Maani et al., 2023; Reidpath & Allotey, 2007; Ruger et al., 2012; Smeeth & Kyobutungi, 2023). Building on other proposals, we argue that such a paradigm shift must be coupled with a transformation of the science driving the field (Buse & Hawkes, 2015; Krumeich & Meershoek, 2014; Shiffman, 2014; Tosam et al., 2018; Yayehyirad & Mariam, 2012) In many respects, the need to do so is urgent and long overdue. The nature of health inequities within and between countries is not static. Rather, health inequities are dynamic and often shift due to evolving social, economic, and policy forces. For example, while there has been a sustained reduction in global inequities in overall lifespan between 1950 and 2015, inequities in longevity among the elderly increased in most countries over the same period (Permanyer & Scholl, 2019). Recent shifts in cardiovascular disease (CVD) prevalence and deaths within the US is another example of the changing nature of inequities. The substantial rise in life expectancy in the United States in the 20th century was largely attributed to a decline in CVD mortality (Mehta et al., 2020). However, this increase in life expectancy has stalled over the past few decades, with some research indicating that the stall was due to a slowing down of the reductions in CVD mortality (Mehta et al., 2020). There is now evidence that the decline in CVD prevalence in the United States in recent decades (1999–2016) was largely driven by a decline in prevalence among the richest 20%, which coincides with a rise in income inequality between the richest 20% and the remainder of the US population (Abdalla, Yu, & Galea, 2020). This evolving landscape CVD outcomes in the US exemplifies the fluid nature of health inequities and how they can shift with changing broader socioeconomic trends. This highlights the need for ongoing reappraisal of the scholarship and interventions that can tackle the drivers of health inequities. In this commentary, we propose four considerations for the future of global scholarship that can help tackle the dynamic nature of global health inequities.

2. Refocusing global health scholarship to emphasize the macrosocial drivers of health

There has been a significant shift in the conversation around what determines our health over the past few decades. Today, there is broad consensus on the pivotal role large-scale social, economic, political, commercial, and cultural forces play in shaping the health of individuals and populations, often collectively referred to as macrosocial drivers of health (e.g., the role of globalization and trade regulations in shaping health outcomes) (World Health Organization, 2008). However, the field has historically had a bio-medical emphasis and much of what is published as global health research often operates as implementation

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science, adapting clinical interventions pioneered in HICs within LMIC settings (Abdalla, Solomon, et al., 2020; Birn et al., 2017).

The task to refocus the field is neither straightforward nor quick, especially given that the impact of the macrosocial determinants on health inequities varies depending on context (Beckfield & Olafsdottir, 2013). Nevertheless, what makes engagement with the macrosocial drivers of health critical to an evolving global health scholarship is that many of these drivers transcend borders, operating on a global scale. These drivers influence levels of income inequality, the accessibility and affordability of medicines and medical supplies, labor market and working conditions, and mold public attitudes towards issues like welfare policies (Krumeich & Meershoek, 2014; Naik et al., 2019; Walls et al., 2018). To narrow health inequities, global health scholarship must engage with the role these macrosocial drivers play in shaping health across different contexts and over time as trends in health inequities can shift with changes in such forces.

By way of example, there has been growing recognition of the role the commercial determinants of health (CDoH) play in shaping the health of populations recently (Kickbusch et al., 2016; Maani et al., 2020, 2022; McKee & Stuckler, 2018; Mialon, 2020). Corporate practices guided by trade regulations contribute to the global burden of disease, particularly non-communicable diseases (NCDs), both directly and indirectly. Over the past few decades, LMICs have seen an increase in the rates of consumption of commodities such as processed foods, soft drinks, alcohol, and tobacco, with a faster pace than what had happened in HICs historically (Masroor & Asim, 2019; Stuckler et al., 2012; Tanchua & Shand, 2016). These changes are often part of concerted efforts by multinational corporations to expand their base of operations to LMICs—aided by global trade policies as well as weak local governance structures and taxation systems—as they face more regulations in HICs. Such rise is occurring against a backdrop of poor health in LMICs, which account for two thirds of the global burden of NCDs (WHO; Bollyky et al., 2017). If left under-regulated, such practices can then lead to increasing inequities in NCDs between countries. At the same time, many LMICs look to expand their markets through engaging with multinational corporations to advance national economic growth. This highlights the pressing need for global health scholarship that addresses the growing impact of commercial entities globally while acknowledging country needs and priorities. Such research can offer guidance on how countries, particularly LMICs, can leverage economic growth and improve the health of their populations, while also mitigating the negative effects of certain corporate behaviors.

3. Embracing population health science to guide global health scholarship

There have been several efforts to define the parameters of global health research over the past few decades without much consensus, creating fragmented approaches to the field (Abdalla, Solomon, et al., 2020). There is now an opportunity to recast global health scholarship as a population health science discipline; a discipline with health inequities among the global population as a core area of focus. Population health science draws from several fields and examines the forces that shape distributions of health across and within populations as well as the mechanisms through which such forces affect the health of an individual. Following a population health science framework will help illuminate how health inequities are produced on a global scale, set the quantitative analytic scope of the field, and invite a more multidisciplinary approach to many of the issues facing the global population (Box 1 provides a summary of the principles of population health science). (Keyes & Galea, 2016; Rose et al., 2008)

One population health science principle that can help guide our thinking on global health inequities is principle eight, which recognizes that a focus on improving efficiency (e.g., overall progress towards a goal such as overall vaccination rates in an area) may increase inequities, disadvantaging or harming some groups (e.g., lower vaccination rates for hard-to-reach sub-populations). For example, the Millennium Development Goals (MDGs) largely set national goals for countries to reach, without explicit emphasis on tackling inequities—except for MDG3 that focused on gender equality and women empowerment (Labonté & Schrecker, 2007). This meant that countries could reach their identified goals while failing some subgroups, often the disadvantaged, in their populations (Labonté & Schrecker, 2007). There is an abundance of evidence showing that while countries made significant progress towards achieving MDG 4—which is concerned with reducing child mortality—such progress did not always translate to a reduction in inequities (e.g., by income group or urbanicity) within countries (Li et al., 2017; Lozano et al., 2011; Mulholland et al., 2008; Nguyen et al., 2013). The final 2015 report on MDGs emphasized the need to account for inequities that may be concealed by progress in achieving global or national goals (Millennium Development Goals Report, 2015). Highlighting the dynamic and contextual nature of inequities, a systematic analysis found that while child health inequities were widening by wealth in HICs, inequities between the poorest and least poor decreased the fastest among 54 LMICs between 1995 and 2012 (Bendavid, 2014). Population health science principle eight would thus nudge us to adopt analytical approaches that always take into consideration the tradeoffs between efficiency and equity when developing global health goals and interventions. The question we must then ask through our scholarship becomes: is this tradeoff justifiable? Recognizing this principle can help move us away from thinking in terms of countries solely as blocks of uniform populations (e.g., HICs versus LMICs). Rather, we should acknowledge that all the populations we study consist of different, dynamic, groups and that may lead to variance in how individuals within these populations respond to interventions.

Another population health science principle that can help guide

Box 1
The Foundational Principles of Population Health Science (Keyes & Galea, 2016; Rose et al., 2008)

1. Population health manifests as a continuum.
2. The causes of differences in health across populations are not necessarily an aggregate of the causes of differences in health within populations.
3. Large benefits to population health may not improve the lives of all individuals.
4. The causes of population health are multilevel, accumulate throughout the life course, and are embedded in dynamic interpersonal relationships.
5. Small changes in ubiquitous causes may result in more substantial change in the health of populations than larger changes in rarer causes.
6. The magnitude of an effect of exposure on disease is dependent on the prevalence of the factors that interact with that exposure.
7. Prevention of disease often yields a greater return on investment than curing disease after it has started.
8. Efforts to improve overall population health may be a disadvantage to some groups; whether equity or efficiency is preferable is a matter of values.
9. We can predict health in populations with much more certainty than we can predict health in individuals.

scholarship is the ubiquity principle (principle five). This principle stipulates that "small changes in ubiquitous causes will result in more substantial change in the health of populations than larger changes in rarer causes" (Box 1). (Keyes & Galea, 2016; Rose et al., 2008) Being guided by such principle is particularly relevant to a scholarship focused on tackling the macrosocial drivers of health globally. For example, obesity prevalence worldwide has risen substantially in recent decades. In 2022, one in eight people were living with obesity globally. (Obesity and overweight) Moreover, there is evidence that as countries develop economically, obesity transitions from wealthier to poorer groups within the country, highlighting yet again the dynamic nature of health inequities (Templin et al., 2019). One of the major causes of obesity is increasing the intake of energy-dense food. (Obesity and overweight) Applying the ubiquity principle can help scholars identify priority areas to study and intervene on to reduce the consumption of energy-high foods on a global scale, necessitating a deeper exploration into why global calorie consumption is at an all-time high and often concentrated among the most disadvantaged due to industry marketing techniques (Choi et al., 2022). Such an approach would then lead an emphasis on studying and addressing CDoH as a ubiquitous macrosocial driver of obesity, rather than concentrating on individual-level interventions like promoting tailored healthy eating programs (Walls et al., 2018).

4. Innovation in data sources, disciplines, and analytical tools

A global health scholarship that focuses on the macrosocial drivers of health and is guided by population health science would benefit from embracing innovations in three areas: our data sources, the academic disciplines we engage with, and the analytical tools we rely on. Researchers concerned with global population health have both the opportunity and responsibility to embrace innovation in these areas, leading to consequential scholarship that can inform decision-making to address health inequities (Galea, 2013).

First, the recent advancements in digital technologies have allowed for the development of unprecedented levels and types of data, often described as big data, that can provide insights on almost all determinants of health (Abdalla & Galea, 2021). In particular, the proliferation of mobile phone networks has proven pivotal in facilitating data collection and improving engagement with populations, even those in remote areas. Using mobile data can then allow for the integration of advanced technologies such as geographic information systems (GIS) in global health scholarship. Ubiquitous use of social media platforms also provides an opportunity to conduct research and share research results, allowing substantial amounts of information to be collected and systematized, albeit with challenges in different settings (Kelil et al., 2022). However, much of the focus on the promise of big data in global health has been around innovating in healthcare (Lang, 2011; 3-D Commission). We argue that big data can offer ever expanding real-time insights into the macrosocial drivers of health. Realizing such potential requires situating data at the center of global health scholarship. It is important to note that even if the field embraces big data, fully understanding and tackling health inequities would require tackling the global digital divide. (Widening Digital Gap between Developed) Resource-limited settings often have inexistent or inefficient institutional level data collection systems. Therefore, improved surveillance systems, capacity strengthening efforts, and efforts for data stratification and standardization of health indicators would go a long way in creating systems that allow for identifying and addressing changing health inequities within and between countries. Embracing the promise of big data without tackling the digital divide will otherwise create another form of inequity.

Second, tackling the complex macrosocial drivers of health necessitates that we engage with methodological innovations that build on the work being done in other disciplines—such as economics, sociology, anthropology, and political science. For example, there have been efforts—largely in the form of Randomized Control Trials (RCTs)—to assess the role cash transfer programs have on different health outcomes by economists both in LMICs and HICs (Fuller et al., 2022; Kilburn et al., 2016; Ranganathan & Lagarde, 2012). Global health scholars would benefit from advocating to systemically incorporate measures that examine health inequities as a component of these economic assessments. It is important to note that such methods are not without limitations; RCTs have significant limitations especially when it comes to providing insights into real-world complexities of population-level interventions (Sanson-Fisher et al., 2007). We use economic assessment RCTs as an example of a tool that is used widely by other disciplines to generate evidence that often guides decision-making in global health and would thus benefit from incorporating a health equity lens.

Third, broadening our analytical toolbox is crucial for an evolving global health field that aims to address the intricate factors that mold global health inequities. For example, embracing systems science methods such as mathematical agent-based modeling—in a world with ever-growing data—would allow the field to tackle the inherent challenges of assessing the complex drivers of health in a global context. To illustrate, the field would benefit from systematically advancing a climate change and health co-benefits agenda—guided by population health science principles and systems analysis tools—that aim to quantify the effects of climate change mitigation and adaptation interventions on health inequities within and between countries (Haines, 2017; Whitmee et al., 2024). Natural experiments can also help us glean valuable insights into the potential of interventions that aim to tackle inequities within or between countries, even with the inherent challenges tied to interpreting observational studies (Moore et al., 2018; Ogilvie et al., 2006).

Importantly, innovations for data-based approaches in global health to tackle inequities cannot be fully successful without engaging communities. Community engagement is not just beneficial in understanding contexts but also in sourcing data, designing interventions, and implementing analytical tools. This necessitates more investment in community participatory research that can prove invaluable in developing contextually relevant scholarship.

5. Doing the science differently

Tackling global health inequities requires scholarship from across the world. Yet, global health scholars remain disproportionately concentrated in certain geographical areas. One analysis of articles published between 2014 and 2016 in four prominent medical journals and five prominent global health journals found that only around 26% of relevant publications had a corresponding author from an LMIC (Ghani et al., 2021). More recent research highlights progress in authorship indicators but advancement has been uneven with the majority of progress occurring among authors from upper middle-income countries (Dimitris et al., 2021). Another analysis showed that 70% of editors in 27 prominent global health journals were from HICs, highlighting a lack of diversity in global health journals, which could bias which papers are published and what health issues are prioritized (Bhaumik & Jagnoor, 2019).

These differences can result in a global health scholarship largely shaped by HIC-centric perspectives, which can restrict our understanding and responsiveness to worldwide health challenges, particularly given that approximately 85% of the global population lives in LMICs. For example, early during the Covid-19 pandemic, many LMICs quickly imported severe restrictive measures from HICs, despite the former generally having much larger percentages of their populations working in informal employment and weaker social safety net (Rashid et al., 2020; Eyawo et al., 2021; Impact of lockdown measures on; Piper). Several underlying factors contribute to the inequities in global health research development and publication, including the significant influence of HICs in guiding research agendas and funding as well as resource constraints in many LMICs. Addressing global health inequities will thus require a commitment to funding and advancing research worldwide.

This will require critically interrogating how and why science is produced, how partnerships are created and enacted, and who benefits from science. Without such a shift, our efforts will remain bound to a narrow viewpoint, impeding our capacity to address health inequities on a global scale.

6. Conclusions

As the landscape of global health continues to evolve, it is imperative that the scholarship underpinning it evolves as well. The historically uni-directional, bio-medical, approach achieved notable successes but often overlooked the multifaceted challenges facing the global population, including inequities between and within countries. To address these inequities, global health scholarship must undergo a transformative shift. This entails a deeper engagement with the macrosocial drivers of health; using population health science principles to guide our scholarship; and broadening our data sourcing, the disciplines we engage with, and the analytical tools we rely on. Beyond these considerations, the field would benefit from exploring the potential contributions of diverse knowledge systems and healing practices that exist across cultures. Importantly, such transformation demands a democratization of scholarship to ensure that voices from all parts of the world shape the field.

These considerations will not address every aspect of the evolving challenges in global population health inequities. However, we propose that reframing global health scholarship using these considerations can help us develop an organized approach to our thinking, foster a shared understanding among researchers, and shed light on the global priorities that inform interventions to address the dynamic nature of global health inequities.

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Salma M. Abdalla: Conceptualization, Writing – original draft, Writing – review & editing. **Sandro Galea:** Conceptualization, Writing – review & editing.

Declaration of competing interest

The authors have declared that no conflict of interest exists.

Data availability

No data was used for the research described in the article.

References

What is driving widening racial disparities in life expectancy?. (2023). KFF. https://www.kff.org/racial-equity-and-health-policy/issue-brief/what-is-driving-widening-racial-disparities-in-life-expectancy/. (Accessed 30 September 2023).

3-D Commission 3-D Commission. Data, social determinants, and better decision-making for health: The report of the 3-D Commission 3-D Commission report. 3-D Commission. https://3dcommission.health/report. (Accessed 10 June 2022).

Abdalla, S. M., & Galea, S. (2021). The 3-D commission: Forging a transdisciplinary synthesis at the intersection of social determinants of health, data, and decision-making. *J Urban Health Bull N Y Acad Med, 98*(Suppl 1), 1–3. https://doi.org/10.1007/s11524-021-00555-w

Abdalla, S. M., Maani, N., Ettman, C. K., & Galea, S. (2020). Claiming health as a public good in the post-COVID-19 Era. *Development, 63*(2), 200–204. https://doi.org/10.1057/s41301-020-00255-z

Abdalla, S. M., Solomon, H., Trinquart, L., & Galea, S. (2020). What is considered as global health scholarship? A meta-knowledge analysis of global health journals and definitions. *BMJ Global Health, 5*(10), Article e002884. https://doi.org/10.1136/bmjgh-2020-002884

Abdalla, S. M., Yu, S., & Galea, S. (2020). Trends in cardiovascular disease prevalence by income level in the United States. *JAMA Network Open, 3*(9), Article e2018150. https://doi.org/10.1001/jamanetworkopen.2020.18150

Beckfield, J., & Olafsdottir, S. (2013). Health inequalities in global context. *American Behavioral Scientist, 57*(8), 1014–1039.

Bendavid, E. (2014). Changes in child mortality over time across the wealth gradient in less-developed countries. *Pediatrics, 134*(6), e1551–e1559. https://doi.org/10.1542/peds.2014-2320

Bhaumik, S., & Jagnoor, J. (2019). Diversity in the editorial boards of global health journals. *BMJ Global Health, 4*(5), Article e001909. https://doi.org/10.1136/bmjgh-2019-001909

Birn, A. E., Pillay, Y., & Holtz, T. H. (2017). *Textbook of global health* (4th ed.). Oxford University Press. New to this Edition:, Fourth Edition, New to this Edition.

Bollyky, T. J., Templin, T., Cohen, M., & Dieleman, J. L. (2017). Lower-income countries that face the most rapid shift in noncommunicable disease burden are also the least prepared. *Health Affairs, 36*(11), 1866–1875. https://doi.org/10.1377/hlthaff.2017.0708

Buse, K., & Hawkes, S. (2015). Health in the sustainable development goals: Ready for a paradigm shift? *Globalization and Health, 11*(1), 13. https://doi.org/10.1186/s12992-015-0098-8

Cao X, Hou Y, Zhang X, et al. A comparative, correlate analysis and projection of global and regional life expectancy, healthy life expectancy, and their GAP: 1995- 2025. J Glob Health. 10(2):020407. doi:10.7189/jogh.10.020407.

Chen, X., Li, H., Lucero-Prisno, D. E., et al. (2020). What is global health? Key concepts and clarification of misperceptions. *Glob Health Res Policy, 5*, 14. https://doi.org/10.1186/s41256-020-00142-7

Choi, Y. Y., Andreyeva, T., Fleming-Milici, F., & Harris, J. L. (2022). U.S. Households' children's drink purchases: 2006–2017 trends and associations with marketing. *American Journal of Preventive Medicine, 62*(1), 9–17. https://doi.org/10.1016/j.amepre.2021.06.013

Dimitris, M. C., Gittings, M., & King, N. B. (2021). How global is global health research? A large-scale analysis of trends in authorship. *BMJ Global Health, 6*(1), Article e003758. https://doi.org/10.1136/bmjgh-2020-003758

Eyawo, O., Viens, A. M., & Ugoji, U. C. (2021). Lockdowns and low- and middle-income countries: Building a feasible, effective, and ethical COVID-19 response strategy. *Globalization and Health, 17*(1), 13. https://doi.org/10.1186/s12992-021-00662-y

Fuller, A. E., Zaffar, N., Cohen, E., et al. (2022). Cash transfer programs and child health and family economic outcomes: A systematic review. *Can J Public Health Rev Can Santé Publique, 113*(3), 433–445. https://doi.org/10.17269/s41997-022-00610-2

Galea, S. (2013). An argument for a consequentialist epidemiology. *American Journal of Epidemiology, 178*(8), 1185–1191. https://doi.org/10.1093/aje/kwt172

Ghani, M., Hurrell, R., Verceles, A. C., McCurdy, M. T., & Papali, A. (2021). Geographic, subject, and authorship trends among LMIC-based scientific publications in high-impact global health and general medicine journals: A 30-month bibliometric analysis. *J Epidemiol Glob Health, 11*(1), 92–97. https://doi.org/10.2991/jegh.k.200325.001

Haines, A. (2017). Health co-benefits of climate action. *The Lancet Planetary Health, 1*(1), e4–e5. https://doi.org/10.1016/S2542-5196(17)30003-7

Healthy Lives and Well-being for Everyone: Why SDG 3 matters and how we can achieve it. International Institute for Sustainable Development. Accessed January 29, 2022. https://www.iisd.org/articles/healthy-lives-and-well-being-everyone-why-sdg-3-matters-and-how-we-can-achieve-it.

Impact of lockdown measures on the informal economy. Published May 5, 2020 http://www.ilo.org/global/topics/employment-promotion/informal-economy/publications/WCMS_743523/lang–en/index.htm. (Accessed 1 October 2023).

Jensen, N., Kelly, A. H., & Avendano, M. (2021). The COVID-19 pandemic underscores the need for an equity-focused global health agenda. *Humanit Soc Sci Commun, 8*(1), 1–6. https://doi.org/10.1057/s41599-020-00700-x

Kanchanachitra, C., & Tangcharoensathien, V. (2017). Health inequality across prefectures in Japan. *The Lancet, 390*(10101), 1471–1473. https://doi.org/10.1016/S0140-6736(17)31792-0

Kelil, T., Jaswal, S., & Matalon, S. A. (2022). Social media and global health: Promise and pitfalls. *RadioGraphics, 42*(4), E109–E110. https://doi.org/10.1148/rg.220038

Keyes, K. M., & Galea, S. (2016). *Population health science*. Oxford University Press.

Kickbusch, I., Allen, L., & Franz, C. (2016). The commercial determinants of health. *Lancet Global Health, 4*(12), e895–e896. https://doi.org/10.1016/S2214-109X(16)30217-0

Kilburn, K., Thirumurthy, H., Halpern, C. T., Pettifor, A., & Handa, S. (2016). Effects of a large-scale unconditional cash transfer program on mental health outcomes of young people in Kenya. *Journal of Adolescent Health, 58*(2), 223–229. https://doi.org/10.1016/j.jadohealth.2015.09.023

Krumeich, A., & Meershoek, A. (2014). Health in global context; beyond the social determinants of health? *Global Health Action, 7*(1), Article 23506. https://doi.org/10.3402/gha.v7.23506

Labonté, R., & Schrecker, T. (2007). Globalization and social determinants of health: Promoting health equity in global governance (part 3 of 3). *Globalization and Health, 3*(1), 7. https://doi.org/10.1186/1744-8603-3-7

Lang, T. (2011). Advancing global health research through digital technology and sharing data. *Science, 331*(6018), 714–717. https://doi.org/10.1126/science.1199349

Li, Z., Li, M., Subramanian, S. V., & Lu, C. (2017). Assessing levels and trends of child health inequality in 88 developing countries: From 2000 to 2014. *Global Health Action, 10*(1), Article 1408385. https://doi.org/10.1080/16549716.2017.1408385

Lozano, R., Wang, H., Foreman, K. J., et al. (2011). Progress towards Millennium development goals 4 and 5 on maternal and child mortality: An updated systematic

analysis. *Lancet Lond Engl, 378*(9797), 1139–1165. https://doi.org/10.1016/S0140-6736(11)61337-8

Maani, N., Abdalla, S. M., Ettman, C. K., et al. (2023). Global health equity requires global equity. *Health Equity, 7*(1), 192–196. https://doi.org/10.1089/heq.2022.0169

Maani, N., Collin, J., Friel, S., et al. (2020). Bringing the commercial determinants of health out of the shadows: A review of how the commercial determinants are represented in conceptual frameworks. *The European Journal of Public Health, 30*(4), 660–664. https://doi.org/10.1093/eurpub/ckz197

Maani, E. by N., Petticrew, M., & Galea, S. (Eds.). (2022a). *The commercial determinants of health*. Oxford University Press.

Machado, D. B., Pescarini, J. M., Ramos, D., et al. (2020). Monitoring the progress of health-related sustainable development goals (SDGs) in Brazilian states using the Global Burden of Disease indicators. *Population Health Metrics, 18*(1), 7. https://doi.org/10.1186/s12963-020-00207-2

Masroor, N., & Asim, M. (2019). SMEs in the contemporary era of global competition. *Procedia Computer Science, 158*, 632–641. https://doi.org/10.1016/j.procs.2019.09.097. Elsevier B.V.

McKee, M., & Stuckler, D. (2018). Revisiting the corporate and commercial determinants of health. *American Journal of Public Health, 108*(9), 1167–1170. https://doi.org/10.2105/AJPH.2018.304510

Mehta, N. K., Abrams, L. R., & Myrskylä, M. (2020). US life expectancy stalls due to cardiovascular disease, not drug deaths. *Proceedings of the National Academy of Sciences of the United States of America, 117*(13), 6998–7000. https://doi.org/10.1073/pnas.1920391117

Mialon, M. (2020). An overview of the commercial determinants of health. *Globalization and Health, 16*(1), 74. https://doi.org/10.1186/s12992-020-00607-x

Millennium Development Goals Report. (2015). Latest Major Publications - United Nations Department of Economic and Social Affairs. https://www.un.org/en/development/desa/publications/mdg-report-2015.html. (Accessed 10 May 2024).

Moore, T. H. M., Kesten, J. M., López-López, J. A., et al. (2018). The effects of changes to the built environment on the mental health and well-being of adults: Systematic review. *Health & Place, 53*, 237–257. https://doi.org/10.1016/j.healthplace.2018.07.012

Mulholland, E., Smith, L., Carneiro, I., Becher, H., & Lehmann, D. (2008). Equity and child-survival strategies. *Bulletin of the World Health Organization, 86*(5), 399–407. https://doi.org/10.2471/BLT.07.044545

Naik, Y., Baker, P., Ismail, S. A., et al. (2019). Going upstream – an umbrella review of the macroeconomic determinants of health and health inequalities. *BMC Public Health, 19*(1), 1678. https://doi.org/10.1186/s12889-019-7895-6

Nguyen, K. H., Jimenez-Soto, E., Morgan, A., Morgan, C., & Hodge, A. (2013). How does progress towards the MDG 4 affect inequalities between different subpopulations? Evidence from Nepal. *Journal of Epidemiology & Community Health, 67*(4), 311–319. https://doi.org/10.1136/jech-2012-201503

Obesity and overweight. https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight. (Accessed 29 September 2023).

Ogilvie, D., Mitchell, R., Mutrie, N., Petticrew, M., & Platt, S. (2006). Evaluating health effects of transport interventions: Methodologic case study. *American Journal of Preventive Medicine, 31*(2), 118–126. https://doi.org/10.1016/j.amepre.2006.03.030

Permanyer, I., & Scholl, N. (2019). Global trends in lifespan inequality: 1950-2015. *PLoS One, 14*(5), Article e0215742. https://doi.org/10.1371/journal.pone.0215742

Piper K. The devastating consequences of coronavirus lockdowns in poor countries. Vox. Published April 18, 2020. Accessed October 1, 2023. https://www.vox.com/future-perfect/2020/4/18/21212688/coronavirus-lockdowns-developing-world.

Ranganathan, M., & Lagarde, M. (2012). Promoting healthy behaviours and improving health outcomes in low and middle income countries: A review of the impact of conditional cash transfer programmes. *Preventive Medicine, 55*, S95–S105. https://doi.org/10.1016/j.ypmed.2011.11.015

Rashid, S. F., Theobald, S., & Ozano, K. (2020). Towards a socially just model: Balancing hunger and response to the COVID-19 pandemic in Bangladesh. *BMJ Global Health, 5*(6), Article e002715. https://doi.org/10.1136/bmjgh-2020-002715

Reidpath, D. D., & Allotey, P. (2007). Measuring global health inequity. *International Journal for Equity in Health, 6*(1), 16. https://doi.org/10.1186/1475-9276-6-16

Rose, G. (2008). Individuals and populations. In G. Rose, K. T. Khaw, & M. Marmot (Eds.), *Rose's strategy of preventive medicine*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780192630971.003.0005.

Ruger, J. P. (2012). Global health justice. In D. A. Hicks, & T. Williamson (Eds.), *Leadership and global justice. Jepson studies in leadership* (pp. 113–129). Palgrave Macmillan US. https://doi.org/10.1057/9781137014696_8.

Sanson-Fisher, R. W., Bonevski, B., Green, L. W., & D'Este, C. (2007). Limitations of the randomized controlled trial in evaluating population-based health interventions. *American Journal of Preventive Medicine, 33*(2), 155–161. https://doi.org/10.1016/j.amepre.2007.04.007

Schumacher, A. E., Kyu, H. H., Aali, A., et al. (2024). Global age-sex-specific mortality, life expectancy, and population estimates in 204 countries and territories and 811 subnational locations, 1950–2021, and the impact of the COVID-19 pandemic: A comprehensive demographic analysis for the global burden of disease study 2021. *The Lancet, 403*(10440), 1989–2056. https://doi.org/10.1016/S0140-6736(24)00476-8

Shiffman, J. (2014). Knowledge, moral claims and the exercise of power in global health. *International Journal of Health Policy and Management, 3*(6), 297–299. https://doi.org/10.15171/ijhpm.2014.120

Smeeth, L., & Kyobutungi, C. (2023). Reclaiming global health. *The Lancet, 401*(10377), 625–627. https://doi.org/10.1016/S0140-6736(23)00327-6

Stuckler, D., McKee, M., Ebrahim, S., & Basu, S. (2012). Manufacturing epidemics: The role of global producers in increased consumption of unhealthy commodities including processed foods, alcohol, and tobacco. *PLoS Medicine, 9*(6), 10. https://doi.org/10.1371/journal.pmed.1001235

Tanchua, J., & Shand, J. (2016). Emerging markets may offer the most potential for the world's largest consumer-focused companies | S&P global. *S&P Global*. Published August 3 https://www.spglobal.com/en/research-insights/articles/emerging-markets-may-offer-the-most-potential-for-the-worlds-largest-consumer-focused-companies. (Accessed 14 May 2021).

Templin, T., Cravo Oliveira Hashiguchi, T., Thomson, B., Dieleman, J., & Bendavid, E. (2019). The overweight and obesity transition from the wealthy to the poor in low- and middle-income countries: A survey of household data from 103 countries. *PLoS Medicine, 16*(11), Article e1002968. https://doi.org/10.1371/journal.pmed.1002968

Tosam, M. J., Chi, P. C., Munung, N. S., Oukem-Boyer, O. O. M., & Tangwa, G. B. (2018). Global health inequalities and the need for solidarity: A view from the Global South. *Developing World Bioethics, 18*(3), 241–249. https://doi.org/10.1111/dewb.12182

Walls, H., Baker, P., & Parkhurst, J. (2018). Addressing trade policy as a macro-structural determinant of health: The role of institutions and ideas. *Global Social Policy, 18*(1), 94–101. https://doi.org/10.1177/1468018117748700

Whitmee, S., Green, R., Belesova, K., et al. (2024). Pathways to a healthy net-zero future: Report of the Lancet pathfinder commission. *The Lancet, 403*(10421), 67–110. https://doi.org/10.1016/S0140-6736(23)02466-2

WHO. Noncommunicable diseases. WHO . Published April 13, 2021 https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases. (Accessed 21 June 2021).

Widening Digital Gap between Developed, Developing States Threatening to Exclude World's Poorest from Next Industrial Revolution, Speakers Tell Second Committee | Meetings Coverage and Press Releases. Accessed June 10, 2024. https://press.un.org/en/2023/gaef3587.doc.htm.

World Health Organization. (2008). Closing the Gap in a generation: Health equity through action on the social determinants of health - final report of the commission on social determinants of health. https://www.who.int/publications-detail-redirect/WHO-IER-CSDH-08.1. (Accessed 22 November 2020).

Yayehyirad, K., & Mariam, D. H. (2012). Moving towards global health equity: Opportunities and threats: An African perspective. *The Ethiopian Journal of Health Development, 26*(1), 238–250. https://doi.org/10.4314/ejhd.v26i1