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COVID-19, nutrition, and gender: An evidence-informed approach to gender-responsive policies and programs

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ABSTRACT

In addition to the direct health impacts of COVID-19, government and household mitigation measures have triggered negative indirect economic, educational, and food and health system impacts, hitting low- and middle-income countries the hardest and disproportionately affecting women and girls. We conducted a gender focused analysis on five critical and interwoven crises that have emerged because of the COVID-19 crisis and exacerbated malnutrition and food insecurity. These include restricted mobility and isolation; reduced income; food insecurity; reduced access to essential health and nutrition services; and school closures. Our approach included a theoretical gender analysis, targeted review of the literature, and a visual mapping of evidence-informed impact pathways. As data was identified to support the visualization of pathways, additions were made to codify the complex interrelations between the COVID-19 related crises and underlying gender relations. Our analysis and resultant evidence map illustrate how underlying inequitable norms such as gendered unprotected jobs, reduced access to economic resources, decreased decision-making power, and unequal gendered division of labor, were exacerbated by the pandemic's secondary containment efforts. Health and nutrition policies and interventions targeted to women and children fail to recognize and account for understanding and documentation of underlying gender norms, roles, and relations which may deter successful outcomes. Analyzing the indirect effects of COVID-19 on women and girls offers a useful illustration of how underlying gender inequities can exacerbate health and nutrition outcomes in a crisis. This evidence-informed approach can be used to identify and advocate for more comprehensive upstream policies and programs that address underlying gender inequities.

1. Background

The COVID-19 pandemic has shocked global systems. In addition to the direct health impacts, resulting government and household mitigation measures, especially lockdown and containment measures, triggered negative indirect economic, educational, and food and health system impacts, hitting low- and middle-income countries (LMICs) the hardest. Not only have women and girls been disproportionately impacted, but these indirect effects compound existing gender inequities for women and girls (Ryan and El Ayadi, 2020). Therefore, our analysis focused on the global impact of the pandemic on women and girls in

LMICs.

The Standing Together for Nutrition Consortium (ST4N), a group of experts in nutrition, gender, economics, and health systems, collectively identified the secondary impacts of the pandemic on nutrition (Osendarp et al., 2021). These emergent crises are: restricted mobility and isolation (Matsungu and Chopera, 2020), reduced income (UNDP, 2020), food insecurity (Picchioni et al., 2021; Carducci et al., 2021), and reduced access to essential health and nutrition services (Ahmed et al., 2021). In addition, as the pandemic continued, the group identified a fifth crisis that impacts girls disproportionately, extended school closures (Burzynska and Contreras, 2020; UNESCO, 2020; Borkowski et al.,

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2021a). The relationship of these five crises to food insecurity and malnutrition is not always direct – nor are the reasons for why women and girls are more adversely affected. When a household experiences shocks or disruptions, such as those caused by COVID-19, a cascade of responses is typically observed, including reduced expenditure on higher-quality diets, intra-household coping strategies such as food rationing and food stretching, children dropping out of school, and increased child labor (Darnton-Hill and Cogill, 2010; Kodish et al., 2018). Compelling surveillance evidence suggests that women absorb food shocks by reducing their own nutrient intakes of macro- and micronutrients before that of their children, causing deleterious effects on their nutritional status (Christian, 2010; Bhutta et al., 2009). We conducted a gender analysis and produced an evidence map on these five critical and interwoven crises that have emerged as a result of the COVID-19 crisis and exacerbated malnutrition and food insecurity, particularly for women and girls in LMICs.

Gender inequality is a cause and effect of malnutrition. Pre-pandemic, gender power relations and women's lack of agency created upstream inequities so that of the 881 million undernourished people worldwide, 60% were women and girls (FAO IFAD UNICEF WFP and WHO, 2021; World Food Programme (WFP), 2022). A review conducted by Taukobong et al. found that proximal gender variables including decision-making power, education, and mobility were all positively associated with nutrition outcomes (Taukobong et al., 2016). The COVID-19 crisis has only exacerbated gender inequality and its effect on malnutrition. Estimates suggest, for example, that the COVID-19 crisis has added 141 million people to the 3 billion already unable to afford a healthy diet worldwide (Laborde et al., 2021). Further estimates indicate that the pandemic may have added 13.6 million more children to those suffering from wasting and 4.8 million more women experiencing maternal anemia (Osendarp et al., 2021). As much as 50% of the global population may not be able to afford even half the cost of a nutritious diet (Osendarp et al., 2021; Laborde et al., 2021).

Conducting a gender analysis to identify underlying gender inequities can help to explain the disproportionate impact of the COVID-19 crisis on women and girls' food insecurity and malnutrition. Gender refers to the socially constructed characteristics of women, men, girls, boys, and gender minorities (WHO. *Gender and Health*, 2022). Gender analysis explores how gender power relations manifest as inequalities, such as through inequitable access to resources, roles and practices, norms and values, autonomy and decision-making power, and institutions and policies. The ways in which gender power relations manifest are context specific and can vary between contexts and over time. Gender also intersects with other social stratifiers such as race, age, disability, etc. to lead to different experiences of privilege or marginalization. Some ways in which gender power relations can manifest as inequities include: women often bear sole responsibility for domestic work, such as feeding and care (Dominguez-Folgueras, 2022); boys may be favored over girls with food and education (Srivastava and WFP, 2021); as income earners, women are more likely to have marginal and informal employment and have limited access to resources (O'Donnell et al., 2021); and, extant legal frameworks and practices, such as land ownership and inheritance laws, often discriminate against women (Mishra and Sam, 2016).

Existing frameworks have made important conceptual contributions to our understanding of gender and nutrition (Krubiner et al., 2021; *Gender*, 2020; UNICEF et al., 2021). The Gender-Transformative Framework for Nutrition (GTFN) applies systems thinking to map drivers of malnutrition, using a gender equality and empowerment lens (O'Leary et al., 2020). UNICEF's framework of malnutrition also considers the role of gender among determinants of nutrition outcomes (UNICEF. *Improving child Nutrition*, 2013). Krubiner et al. developed a conceptual framework to illustrate the ways in which women's and girl's lives are impacted by a health crisis, using evidence from the COVID-19 pandemic (Krubiner et al., 2021). Using the socio-ecological model as a guide, Naja and Hamadeh developed a multi-level framework of action

to support nutrition during the COVID-9 pandemic, addressing interrelated individual, community, national, and global factors (Naja and Hamadeh, 2020). Recently, UNICEF also developed a conceptual framework for the indirect impact of COVID-19 on maternal, child, and adolescent health and wellbeing (UNICEF et al., 2021).

Building on these frameworks that show the relationships between gender and nutrition, this manuscript presents a systematic process for identifying and mapping out these relationships in relation to specific interventions or shocks. This process leads to the development of a gender evidence map. Within this paper we use COVID-19 as a case study to demonstrate the connection between COVID-19 containment measures (as an intervention), the disproportionate impact of the intervention on populations of women and girls, the role of underlying gender norms, roles and relations, and the effect on nutrition outcomes.

There are some important assumptions made regarding gender which influenced our analysis. While the ways in which gender power relations manifest are context specific, there are some similarities across contexts which are supported by evidence. For example, while men and boys are also affected by gender power relations, women and girls are disproportionately negatively impacted. In addition, gender intersects with other social stratifiers such as race, age, disability, etc. to lead to different experiences of privilege or marginalization, meaning that not all men, women, boys, and girls will be impacted by gender power relations in the same way. Within our review we identified ways in which women and girls were negatively impacted by gender power relations while recognizing that many of these will be context specific. Through the evidence we were able to identify common patterns in how gender power relations manifest as inequities to affect women's nutrition status.

This manuscript describes and demonstrates a process for program implementers and researchers to systematically identify and consider the (in this case negative) role and impact of underlying contextual gender norms, roles, and relations on intervention outcomes. To do so, we 1) describe the analytical process followed 2), document the relationship between COVID-19 containment measures and their disproportionate impact on women and girls and the resulting effect on nutrition, and 3) articulate and visualize how underlying gender inequities fuel and reinforce these impacts which lead to poor health and nutrition outcomes. Mapping the gendered pathways allows policy makers and program planners to anticipate, and plan to mitigate gender inequity's impact on both health and nutrition outcomes. In this article, we describe the process of this kind of mapping exercise, emphasizing the value of both for understanding gendered impacts of COVID-19 related policy.

Understanding how underlying gender inequities can affect the outcomes of an intervention allows program implementers to design more effective interventions that address systemic constraints. We propose that the process outlined in this paper can be useful for program design and advocacy. It can be used by program implementers to identify and prioritize mechanisms to address detrimental gender norms, roles, and relations relevant for their interventions and as an advocacy tool to persuade decision-makers of the importance of addressing them.

2. Methods

We developed an analytical process to support intervention-specific gender analysis yielding a **gender evidence map**. Our approach entailed a theoretical gender analysis, a targeted review of literature, and a visual mapping of evidence-informed impact pathways. The process was completed through a collective COVID-19-nutrition-response effort, the ST4N.

An ST4N working group with expertise in gender, nutrition, economics, and food systems developed the initial framework using a gender analysis matrix, hypothesizing causal pathways through which COVID-19 could disproportionately affect the nutrition and food security of women and girls in LMICs. In particular, the group sought to document the complexity of the pathways, often with multiple steps and

layers. A gender analysis matrix is a tool which can be used to systematically explore how gender power relations influence a particular topic, such as nutrition (Morgan et al., 2021). It uses an established gender framework which identifies the ways in which gender power relations manifest as inequities, such as through access to resources, roles and practices, norms, values, and beliefs, decision-making power and autonomy, and policies, laws, and institutions (Morgan et al., 2016). These are mapped against relevant topic-specific domains (in our case, domains related to nutrition, such as diet and nutritional intake, food availability and access, and access to health service).

Next, to establish an evidence base for the hypothesized pathways we undertook a ‘realist’ review (a strategy for synthesizing research by unpacking how complex programs work (or fail) in particular contexts and settings) to address the challenge of this complex and emerging policy area (Pawson et al., 2005). The secondary impacts of the pandemic created a novel and complex global shock that impacted economic, health, food, and educational systems. Unlike past economic or health crises that impacted nutrition, this interrelated and complex shock can only be analyzed, understood, and mitigated with a multi-system approach. The search for emerging evidence was iterative and involved multiple search strategies and approaches. Quantitative and qualitative evidence was mapped to each step in the pathways, including effect sizes when available. The initial search provided a starting point for understanding the COVID-19-related changes we might identify and include in the framework. This included concepts that captured ‘school closures’, ‘food insecurity’, and ‘job loss’, all major and well-documented ramifications of the COVID-19 pandemic and other recent pandemics including HIV/AIDS and Ebola. We built on these concepts by including terms to capture “COVID-19” (i.e., coronavirus, COVID-19 pandemic) and “gender” (i.e., gender, women, girls). We then reviewed combinations of these terms in health-related databases including PubMed, Embase, and Scopus. Given the emerging nature of COVID-19 related data we also reviewed Google Scholar and pre-print databases. Relevant resources identified linkages between the COVID-19 pandemic, its response, and gender. These were further reviewed to identify connections between gender and nutrition outcomes (i.e., stunting, wasting, malnutrition, etc.). We also searched the bibliographies of relevant resources to capture additional articles and reports not found through the traditional search. No other inclusion or exclusion criteria were used and we did not conduct quality assessments of the resources. All resources were cataloged in Sciwheel (an online software designed for resource storage, sharing, and note-taking) and reviewed by two independent reviewers. During this process, each reviewer extracted pathway components to inform the visual framework, and document relevant effect sizes (where available) and recommendations for interventions.

As data was identified to support the visualization of evidence-informed pathways, additions were made to codify the complex interrelations between the COVID-19-related crises and underlying gender relations. The pathways included in the map are those for which evidence was identified through the literature review. The framework was further refined and simplified through a series of reviews within the ST4N, including with experts’ broad expertise in these domains. Additional refinements were made after discussions with external groups, such as the Gender Transformative Network and normative UN agencies.

In this manuscript we present two of the five interconnected crises to demonstrate how existing gender norms, roles, and relations can cause an intervention or shock to disproportionately affect women and girls and lead to negative outcomes, such as increased malnutrition, highlighting the need to intervene at this level. In these simplified figures, we depict the relationships as somewhat linear, moving from left (the immediate COVID-19 effects) to right (nutrition outcomes), although there are many cyclical and cross-cutting effects across the five crises. Moreover, gender norms, roles, and relations are shown as outside of the linear pathways, although they are preexisting and woven throughout the economic, institutional, and socio-cultural interactions illustrated in

the figures. The complete framework (Appendix 1) provides the more complex picture, including all five identified crises caused by COVID-19, highlighting the interconnected complexities across these crises.

2.1. COVID-19 immediate effects, underlying gender norms, roles, and relations, and the disproportionate impact on women and girls’ nutrition

This section documents the gendered evidence maps for two critical immediate effects of COVID-19 - school closures and reduced income and job loss. It summarizes the results of the realist review to specify the relationship between these COVID-19 measures and nutrition outcomes, mapping how underlying gender inequities fuel and reinforce inequitable outcomes along the pathway.

3. Results

3.1. School closures

Extended school closures due to COVID-19 affected more than 1 billion school children worldwide at the pandemic’s peak (UNESCO, 1, 2020). When schools close, children no longer have access to critical services including school meals, health and nutrition education and counseling (i.e., family planning), and conditional cash transfers for school attendance (Borkowski et al., 2021b; Warren and Wagner, 2020; UNESCO, 2021). During the first COVID wave, there was an estimated 30% reduction in the coverage of essential nutrition services in LMICs (Fore et al., 2020).

Especially in LMICs, school closures have dire effects for girls (UNESCO, 2020). When girls are at home, and not school, they can experience increased workloads due to widespread norms and practices that view domestic work like food preparation and (child and elder) care to be the domain of women and girls (Population Council, 2020; McKinsey Global Institute, 2020; UN Women, 2020a; UN Women, 2020b). In contexts where girls’ education is less valued than boys’, increased burden of domestic work may contribute to school drop-outs. For example, a study in south India found that having young siblings in the households requiring care, was associated with girls dropping out of school (Prakash et al., 2017). In the context of COVID-19, increased domestic workloads—due to factors such as young siblings out of school, reverse migration of relatives, and sick households members requiring care—have been disproportionately shouldered by women and girls (UN Women, 2020b; Flor et al., 2022). UN Women (2020) report that children are helping more at home since the spread of COVID-19, with girls disproportionately (67 percent of daughters compared to 57 percent of sons) taking on this additional unpaid work. Global data show that girls were 1.2 times more likely to drop out of school than boys during the pandemic, although differences were not statistically significant after controlling for geographical, social, and demographic factors (Flor et al., 2022). However, from a gender lens, controlling for these factors can mask the intersectional relationship between gender and other social stratifiers which masks the complex ways in which inequity can manifest. The global aggregate data show us that girls dropping out of school during the pandemic is a worldwide problem, however, disaggregated data shows us that the gaps are even greater in some regions. The largest gaps, for example, were found in central and eastern Europe and central Asia (ratio of women to men 4:10), and south Asia (ratio of women to men 1:48). While the reasons for drop out were not directly related to school closures, it can be difficult to unpack the compounded nature of these impacts, including increased domestic responsibilities, job losses, and the need for additional income which can be difficult to capture with quantitative data. Global and statistically significant data also show that women were more likely to forgo paid work to care for others throughout the pandemic, contributing to women’s disproportionate loss of jobs and income discussed in the next section (Flor et al., 2022).

Norms related to sexuality, masculinity, and marriage put girls at

increased risk of sexual and gender-based violence (GBV) (UN Women, 2020b; Bramhankar and Reshmi, 2021; Kotlar et al., 2021; WHO, 2020) and early marriage (UNESCO, 2020; UNICEF, 2021; Psaki, 2016), especially when not in school and faced with social isolation. Due to reduced access to health and fertility counseling (as well as economic pressures, discussed in the next section), girls may be more likely to have earlier sexual debut leading to pregnancies at younger maternal age, and associated fertility risks and adverse birth outcomes (UNICEF, 2021; Wenham et al., 2020; World Vision, 2021a; World Vision, 2021b; World Health Organization (WHO), 2020; Eaton, 2021; Ganchimeg et al., 2014; Zulaika et al., 2022; Gibbs et al., 2012; Fall et al., 2015).

Fig. 1 visualizes the pathways through which school closures (purple) have likely disproportionately affected women and girls (yellow), interacting with existing gender norms, roles and relations (green), to exacerbate nutrition outcomes (blue).

As evidenced by previous health crises, girls are at increased risk of not returning to school because they got married or pregnant, fueled by social norms that discourage return or induce feelings of shame and harmful legal frameworks and practices that ban pregnant girls from returning to school (Warren and Wagner, 2020; Eaton, 2021; Zulaika et al., 2022; Selbervik, 2020; Human Rights Watch, 2021; Save the Children International, 2020; Baker, 2020; Wiggins et al., 2020). If they are able to return, they may be urged to transfer schools to avoid embarrassment, which has negative implications for learning (Moscoviz and Evans, 2022). Evidence from COVID-19 suggests that girls in Sub-Saharan Africa may be particularly vulnerable. For instance, in Kenya the risk of undesired sexual encounters increased and risk of pregnancy doubled among adolescent girls during the 6-month school closure, and in regions of Nigeria where child marriage is prevalent, girls' enrollment was more affected by the pandemic than boys' (Moscoviz and Evans, 2022). Lost educational attainment may decrease girls' future economic productivity and lifetime earnings (UNICEF et al., 2021; Warren and Wagner, 2020; Selbervik, 2020; Azevedo et al., 2021). Furthermore, gender inequities in educational attainment have been shown to be associated with child malnutrition in the next generation, based on an analysis of 49 LMICs (Siddiqui et al., 2020; Ekbrand and Halleröd, 2018).

Many families rely on schools to provide meals for their children.

Globally, school closures during the pandemic were estimated to have caused more than 368 million school children to miss out on school meals (Borkowski et al., 2021b). This increased the burden on families to provide additional meals for children, at a time when food prices have also increased dramatically (Global, 2020; Béné et al., 2021; Kinsey et al., 2020), exacerbating food insecurity (Food insecurity due to job and income loss is discussed in more detail in the next section). Combined with gendered food allocation practices that often favor adult males, missing out on school-based nutrition programs may drive girls' food insecurity and malnutrition rates disproportionately upwards (Alvi and Gupta, 2020; UNICEF, 2021; Kumar et al., 2020; Chakrabarti et al., 2021).

Pregnancies at younger maternal age and associated adverse maternal and infant nutrition and health outcomes may induce further reduced intergenerational lifetime earnings and poor nutrition outcomes (UNICEF et al., 2021; Warren and Wagner, 2020; World Vision, 2021b; Ganchimeg et al., 2014; Gibbs et al., 2012; Fall et al., 2015; Black et al., 2013; Galasso and Wagstaff, 2018; James et al., 2022; Vyas, 2021). A prospective study among women in Brazil, Guatemala, India, the Philippines, and South Africa found younger maternal age (≤ 19 years) to be associated with low birthweight (OR:1.18), preterm birth (1.26), stunting at two years old (1.46), and lower secondary education attainment (1.18) (Fall et al., 2015). Assuming a 28% increase in adolescent pregnancies due to school closures, UNICEF estimates a 42% increase in the number of low birthweight babies and an associated 20% increase in the number of children stunted by two years old and a 10% loss of future lifetime earnings for those born with low birthweight (UNICEF et al., 2021; Gibbs et al., 2012; Black et al., 2013; Galasso and Wagstaff, 2018; Smith, 2020).

3.2. Loss of income and jobs

The COVID-19 crisis has widened the gender employment gaps and left women more vulnerable than men to job loss and loss of associated social protections and access to healthcare (Kotlar et al., 2021; United Nations University International Institute for Global Health (UNU-IIGH), 2021) triggered by disruptions to global and local supply chains. Women are more likely to be employed without formal contracts or in feminized sectors with little job security or bargaining power (Nanthini and Nair,

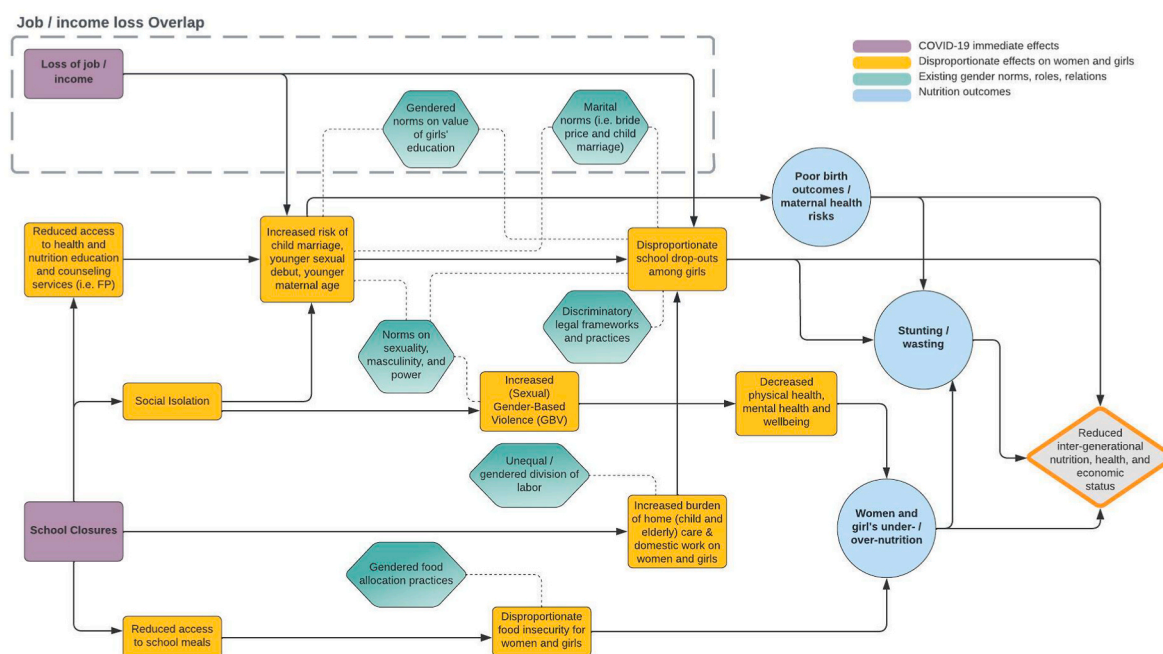


Fig. 1. Gender evidence map: Pathways from school closures to nutrition outcomes, Figure Source: Authors' visualization based on their own analysis.

2020). Estimates suggest that women’s employment is 19% more at risk compared to men; 72% of domestic workers (80% of whom are women) lost their jobs as a result of COVID-19, and there was a documented decrease in income during the first month of the pandemic of 740 million women working in the informal economy (UNDP, 2020; United Nations University International Institute for Global Health (UNU-IIGH), 2021). Women in eight countries in Asia-Pacific worked fewer hours or lost their jobs (with a job loss range from 25 to 56% across all countries); in Bangladesh women in formal employment were almost six times as likely to work fewer hours than their male counterparts since the outbreak (UN Women, 2020a; UN Women, 2020b). An analysis of 49 LMICs suggests that gender inequities in employment may contribute to child malnutrition, highlighting the likely multi-generational effects (Siddiqui et al., 2020; Ekbrand and Halleröd, 2018).

Fig. 2 visualizes the pathways through which income and job loss (purple) have likely disproportionately affected women and girls (yellow), interacting with existing gender norms, roles and relations (green), exacerbating nutrition outcomes (blue).

Discriminatory legal frameworks and practices underly constraints to livelihoods options for women, especially due to marital property laws and inheritance patterns that limit their control over and formal ownership of land (Doss et al., 2020). Land and other assets are critical for agricultural production of food or income and to facilitate access to credit to support non-farm enterprises (Ragasa and Lambrecht, 2020). Women’s livelihoods opportunities and food security are further diminished by COVID-19 as they will likely struggle to assert their rights to property after the deaths of male family members, as evidenced by experiences from the HIV/AIDS, Ebola, and Zika epidemics (Doss et al., 2020; Ragasa and Lambrecht, 2020).

Loss of women’s income may limit their decision-making power over household resource allocation, potentially decreasing investments in nutrition and health and worsening gender biases in household food allocation (Siddiqui et al., 2020; Ekbrand and Halleröd, 2018; van den Bold et al., 2013). Furthermore, when faced with food insecurity, women face difficulties adhering to appropriate infant and young child feeding practices –including exclusive breastfeeding and complementary feeding – due to food access limitations as well as effects of hunger

on maternal anxiety (Webb-Girard et al., 2012; Lesorogol et al., 2018; Venu et al., 2017).

Loss of income and food insecurity –combined with school closures– may force girls to enter the labor market to substitute lost income or get married to reduce financial stress on the household through a bride price payment or simply having one less person to feed. As discussed in the previous section, girls entering the labor market may expose themselves to increased risk of sexual assault, early sexual debut, and early maternal age and child marriage will increase risk of early sexual debut and maternal age (Warren and Wagner, 2020; UNESCO. UNESCO, 2020; UNICEF. COVID-19, 2021; World Vision, 2021b; Save the Children International, 2020; Berkeley Economic Review, 2018; Mutsaka, 2022).

4. Discussion

COVID-19 has had a devastating effect on women and girls who have been disproportionately impacted across multiple social, economic, health and nutrition outcomes. At the same time, the pandemic has exposed pre-existing and underlying gender inequities, which containment measures served to exacerbate. Analyzing the indirect effects of COVID-19 on women and girls is a useful case study to illustrate how underlying gender inequities can exacerbate health and nutrition outcomes in a crisis. Mapping the gendered pathways allows policy makers to anticipate and plan to mitigate gender inequity’s impact on health and nutritional outcomes.

Health and nutrition policy and programming often fail to identify and address the underlying gender norms, roles, and relations that inhibit their effectiveness, as gender power relations can appear tangential or irrelevant to the desired health outcome and can be difficult to identify, measure, and address. Gender norms are embedded into the fabric of society – changing them is often seen as beyond the scope of health policies. While many nutrition (or other health related) interventions can have immediate positive results on the health and nutrition of those directly involved in the intervention, without addressing the underlying causes which led to or exacerbated inequitable nutritional outcomes, these changes are unlikely to be sustained or to extend to those not involved in the intervention – including having

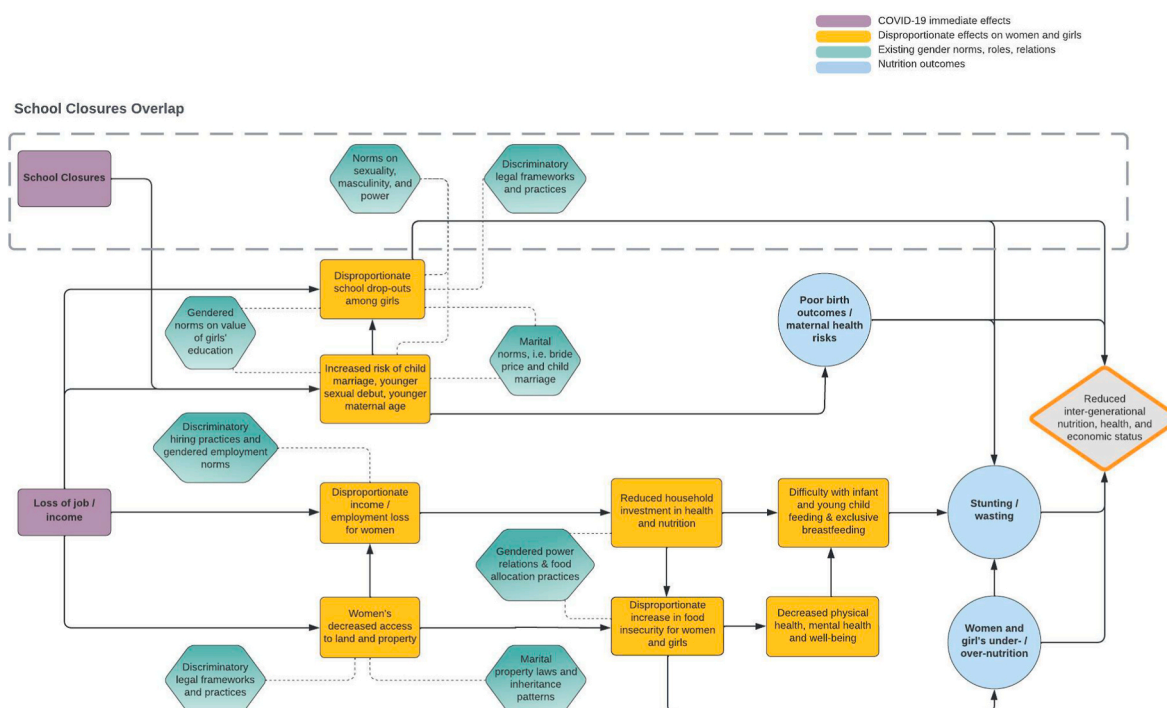


Fig. 2. Gender evidence map: Gendered pathways from income and job loss to nutrition outcomes, Figure Source: Authors’ visualization based on their own analysis.

intergenerational impacts. However, once structural changes in gender norms are realized, the results are often lasting and sustainable (Thornton et al., 2016; Levy et al., 2020).

Our analysis and resultant gender evidence map illuminates how underlying inequitable norms and structures, such as gendered job protections, access to economic resources, decision-making power, expectations of caregiving, and division of labor, exacerbated the indirect effects of the pandemic on women and girls. These norms, roles, and relations fueled and exacerbated poor health and nutrition outcomes for women and girls. Identifying gender inequities can influence how, where, and when we design policies and programs, which can positively affect our ability to meet objectives. In this case, understanding the gender inequities at play provides insights for equitable recovery from the pandemic's secondary effects, especially containment measures which, while necessary to slow the spread of the virus, disproportionately affected women and girls. Below we consider the two examples of school closures and increases in poverty, and how our analytical approach can be used to identify more comprehensive upstream policies and programs.

4.1. School closures

For girls, the evidence map shows the evidence-informed pathway instigated by school closures, leading to girls' disproportionate risk of child marriage and adolescent pregnancies, with potentially severe consequences for low birth weight and malnourished infants. Additionally, the framework shows how the loss of school meals increases household food insecurity, which, due to gendered expectations, may disproportionately force girls to bear the brunt of household food insecurity, and further add pressure for early marriages. Policies and programs therefore need to be multi-pronged, with a focus on continuing educational offerings during closures and incentivizing girls to return to school as soon as viable, as well as providing alternatives for missed school meals. This could include implementing programs to maintain school retention, including alternative delivery channels for lessons (i.e., radio broadcasts) and providing a safe venue for health, family planning, and social protection programs. To incentivize girls to return to school, policymakers could utilize conditional cash transfer programs for families to support girls' education and ensure pregnant girls have access to educational programs and a path to return to school. Legal measures and their enforcement are also needed to prevent child marriage.

4.2. Investing in women's livelihoods

As women in low and middle income countries are more likely to be employed in the informal sector and therefore more likely to lose their jobs during economic shocks, the second evidence map demonstrates the pathways between how the loss of income and increased food insecurity, exacerbated by women's reduced decision-making ability to direct resources to her own and their children's nutrition and health, will reduce access to healthy foods and increase malnutrition for herself and her children. Providing targeted transfers through social protection and supporting women's livelihoods can increase women's access to resources and their decision-making agency, leading to improved nutritional outcomes for themselves and their children. Social protection policies that provide direct cash transfers to women, extend unemployment benefits to the informal sector, and invest in return to work programs have been shown to promote gender equity (IPC-et al., 2017). Women's livelihoods can also be supported by providing loans and incentives for women-owned businesses, increasing access to information and land, supporting childcare so women can return to work, addressing discriminatory laws, and supporting women who are historically most affected.

Policies and programs that support women's empowerment, including education, decision-making for themselves and their families, and access to and control over their assets and finances, support

household and community resilience to health and economic shocks. These upstream recommendations for investment and policies from governments and donors will offset and protect against the pandemic's disproportionate and intergenerational impact on women, girls, and children. Prioritizing women and girls, particularly the most vulnerable, will boost the reach and effectiveness of COVID-19 recovery and build resilience for future shocks.

4.3. Using the analytical framework

The analytical process and resultant gender evidence map can be useful as an implementation or advocacy tool. While this framework has been designed with both program implementers and policy makers in mind, plans are to further develop the framework for these purposes, including testing and validation. In program planning, this analytical approach could support the identification of gender power relations that may hinder an intervention's impact and mapping of evidence-informed pathways to show the relationship between the intervention, underlying gender power relations, impact on men, women, and/or gender minorities, and intervention outcomes. By identifying evidence from the literature to showcase this pathway, the framework can be used to not only identify which underlying gender norms, roles and relations should be addressed during development of interventions and policies, as well as for advocating for the need for them to be addressed.

5. Conclusion

Program implementers, policymakers, and researchers do not always connect upstream factors such as gender inequities to health outcomes, choosing instead to intervene more downstream at the point of implementation. By drawing on quantitative and qualitative evidence to systematically connect upstream issues related to gender inequity to nutrition outcomes, we provide strong evidence of the need for and importance of intervening at this level to create systemic and long-lasting change, and demonstrate a process to help them identify which underlying gender norms, roles, and relations to consider. While our findings were based on the COVID-19 crisis, this approach is relevant for any intervention or shock to address (and avoid worsening of) gender inequities and inequalities.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2022.115364>.

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