Gender Equality, Norms, and Health 3

Improving health with programmatic, legal, and policy approaches to reduce gender inequality and change restrictive gender norms

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This is the third in a Series of five papers about gender equality, norms, and health

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Evidence that gender inequalities and restrictive norms adversely affect health is extensive; however, far less research has focused on testing solutions. We first comprehensively reviewed the peer-reviewed and grey literature for rigorously evaluated programmes that aimed to reduce gender inequality and restrictive gender norms and improve health. We identified four mutually reinforcing factors underpinning change: (1) multisectoral action, (2) multilevel, multistakeholder involvement, (3) diversified programming, and (4) social participation and empowerment. Following this review, because little research has investigated the effects of national-level law and policy reforms, we conducted original quasi-experimental studies on laws and policies related to education, work, and income, all social determinants of health in which deep gender inequalities exist. We examined whether the laws and policies significantly affected health outcomes and gender norms, and whether law-induced and policy-induced changes in gender norms mediated the health effects, in areas for which longitudinal data existed. Laws and policies that made primary education tuition-free (13 intervention countries with the law and/or policy and ten control countries without) and that provided paid maternity and parental leave (seven intervention and 15 control countries) significantly improved women's and their children's health (odds ratios [OR] of 1·16–2·10, depending on health outcome) and gender equality in household decision making (OR 1·46 for tuition-free and 1·45 for paid maternity and parental leave) as a proxy indicator of gender norms. Increased equality partially mediated the positive effects on health outcomes. We conclude by discussing examples of how improved governance can support gender-equitable laws, policies, and programmes, immediate next steps, and future research needs.

Key messages

- High-quality gender-transformative programmes shared several features: multisectoral action, multilevel and multistakeholder involvement, diversified programming, and social participation and empowerment
- Tuition-free primary education and paid maternity and parental leave policies improved gender equality in decision making and improved health outcomes; these policies had both direct positive health effects and a positive impact on health mediated by more gender equality in decision making
- More broadly, policies and programmes that lead to greater equality in education and at work are promising for increasing life expectancy as an increase in educational parity was significantly associated with improvements in both female and male life expectancy, and an increase in parity at work with improvement in female life expectancy
- Increasing gender equality in governance matters for the passage and implementation of transformative programmes, laws, and policies; many countries provide promising approaches to increasing gender equality in leadership positions and monitoring equity of budgets and human resource allocations
- For both policy and programmatic interventions, long-term follow-up of their passage, support, and implementation across settings is needed

Introduction

Adverse social circumstances—including educational disadvantage, poverty, and poor working conditions—raise morbidity and mortality, as shown conclusively by the vast published literature, well summarised by the WHO Commission on Social Determinants of Health.[1,2] Extensive evidence shows that gender inequalities leave women and girls worse off in each of these areas.[3] For example, an estimated 5 million more girls of primary-school age are out of school than boys.[4] Women earn only 77% of their male counterparts' wages, and their overall labour-force participation, 48·5%, trails 26·5 percentage points behind men's.[5] Governance structures shaping education, work, and income are also grossly unequal. Women constitute only a minority of private-sector chief executive officers,[6] and women's representation in national parliaments still stands at only 23·7%.[7]

Gender inequalities and power imbalances also markedly affect interpersonal relationships and individual agency. A 2018 analysis of surveys from 54 countries found that four in five women did not have agency in critical aspects of family relationships.[8] Furthermore, women and girls disproportionately carry caregiving and household responsibilities globally. According to data from 83 countries and areas, women allocate 2·6 times as much of their day to unpaid care and domestic work as men.[7]

When women receive lower wages, pensions, or social protections than men, they are personally disadvantaged, their households have fewer resources, and less money is spent on the health and education of all children.[9,10] Although gender inequalities disproportionately disadvantage women and girls, both gender inequalities

and restrictive gender norms negatively affect the health of people of all sexes. Papers 1 and 3 of this Series[11,12] on gender equality, norms, and health provide numerous examples of pathways whereby restrictive gender norms affect the health of men and boys[13–15] and gender and sex minorities, as well as women and girls.[16–19]

There is a vast breadth of settings important to human health—including interpersonal relationships, schools, workplaces, and governments—in which restrictive gender norms, as well as gender inequalities, prevail. Restrictive gender norms help to perpetuate, reinforce, and propagate inequalities and shape how people live, grow, interact, learn, and work.[11,12] Addressing gender inequalities and restrictive gender norms is essential for respecting everyone's human rights, and, beyond this intrinsic importance, can lead to substantial potential health gains for all.

This paper, the third in this Series, focuses on approaches that aim to decrease gender inequalities and restrictive gender norms and improve health. Particularly, we investigate what works in societal, community, and household settings that dramatically influence health outcomes but do not deliver medical care. In paper 4 of this Series,[20] the effects of gender inequalities and restrictive gender norms in health systems are detailed.

Because these approaches have prompted varying quantities of research, this paper adopts differing methods of examining how programmes and how laws and policies might affect gender inequalities, restrictive gender norms, and health outcomes. Other promising vehicles of change, including social movements and governance, are addressed in paper 5 of this Series.[21]

We begin by presenting a comprehensive review of existing research on the effectiveness of programmes at improving health and addressing restrictive gender norms.[22] We then present original research on an understudied topic: the potential of laws and policies to change both gender norms and health outcomes at scale. Both possible pathways of impact—programmes, and laws and policies—are shown in our conceptual model (appendix), which builds on the framework presented in paper 1 of this Series.[11] In our discussion, we examine promising reforms in governance, which can affect the success of laws, policies, and programmes at improving gender equality. We conclude by discussing our findings' implications for ongoing efforts to improve health.

Improving health and transforming gender norms through programme implementation

We comprehensively researched the peer-reviewed and grey literature to identify rigorously evaluated programmes that fit criteria for gender-transformative programming[22] (panel 1) and sought to change health outcomes in any area. By searching for and including any rigorously evaluated programme, provided it fit the parameters of our gender-transformative definition and evaluated changes in a health-related outcome (at minimum) or health-related and gender-related outcomes (at best), we expanded on previous reviews that focused largely on programmes implemented in low-income and middle-income countries (LMICs) and measured sexual and reproductive health outcomes.[23,24]

Descriptive analysis of findings

We identified 87 evaluations of 85 programmes that met evaluation criteria by using quantitative methods that can assess causality (appendix): 52 (60%) used exclusively quantitative approaches and the remaining used mixed methods. 40 (46%) used a randomised experimental design and 47 (54%) were quasi-experimental. Geographically, the 85 programmes were heavily concentrated in sub-Saharan Africa (n=39, 46%), south Asia (n=20, 24%), and North America (n=14, 16%). Although the search strategy included any health outcome, 78 (90%) of the studies measured outcomes related to HIV, family planning, or violence. Studies also measured outcomes related to maternal and child health (n=12, 14%); nutrition (n=7, 8%); substance abuse (n=7, 8%); water, sanitation, and hygiene (n=6, 7%); mental health (n=6, 7%); and infectious disease (n=1, 1%). 43% of studies (n=37) focused on several areas of health at once (appendix). Four programmes were adapted and implemented in multiple geographic regions.

Only eight programmes (9%) addressed intersectionality by focusing on gender in one or more of their country's ethnic minority populations (eg, black or African American, Latinx); none of the programmes exclusively targeted gender or sex minorities.

Programme activities

Most (n=83, 98%) of the evaluated programmes implemented interactive awareness-building or educational activities to foster critical awareness of existing norms and inequalities, create space for community engagement and debate, and facilitate discussion of how gender norms might advantage or limit one's opportunities. Topics included local, restrictive gender norms (n=64, 75%); health education (n=64, 75%); laws and policies and one's rights or entitlements (n=21, 25%); and literacy training (n=4, 5%). Other popular approaches focused on engaging the community or building social support systems, or both (n=74, 87%). For example, they held community events, such as local health fairs (n=3, 4%), theatre or drama presentations (n=13, 15%), and prayer meetings (n=1, 1%); and they fostered social integration through sports (n=5, 6%), life-skills training (n=15, 18%), mentorship or peer support (n=16, 19%), community or civic engagement (n=16, 19%), and activities like role playing, to build communication skills and change social norms related to the right to express opinions or negotiate choices (n=45, 53%).

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See **Online** for appendix

Panel 1: **Methods and analysis for the comprehensive review of evaluated programmes**

Search strategy and selection criteria

To identify gender-transformative programmes, we searched the literature for evaluated programmes that met at least one of the criteria of the Interagency Gender Working Group's (IGWG) widely used definition: programmes that "seek to transform gender relations to promote equality and achieve program objectives…by: 1) fostering critical examination of inequalities and gender roles, norms, and dynamics; 2) recognizing and strengthening positive norms that support equality and an enabling environment; 3) promoting the relative position of women, girls, and marginalized groups; and 4) transforming the underlying social structures, policies, and broadly held social norms that perpetuate gender inequalities."[22] The IGWG was established in 1997 to address gender equity and is a network comprising civil society organisations and governmental agencies. In using the IGWG definition, we examined all programmes with aims that included intent to transform gender norms, whether or not they accomplished the aims.

We reviewed only studies that took a widely accepted approach to evaluating causality and used either randomised controlled trials (RCTs) or quasi-experimental designs, including propensity score matching and other matching methods, instrumental variable estimation, and difference-in-difference methods. To qualify for selection, the evaluations had to be published in English, French, Spanish, or Portuguese between Jan 1, 2000, and Dec 31, 2017. Furthermore, studies had to have a participant retention of more than 60% and a sample size of at least 50 people and 100 people per experimental group for RCTs and quasi-experimental designs, respectively. Data from mixed-methods studies were included if their quantitative components met these criteria.

We first conducted a review of the peer-reviewed literature, translating our inclusion criteria into search terms (appendix) and running the terms in Scopus, EBSCO, and Web of Science. Our initial search retrieved 19 803 articles. After eliminating duplicates, screening titles and abstracts, and conducting a secondary screening of the full-text articles on the basis of our inclusion criteria, we identified 61 peer-reviewed evaluations of distinct programmes that met the full inclusion criteria.

To account for the possibility that some well conceived programmes were evaluated but not published in peer-reviewed journals, we comprehensively searched the grey literature on interventions targeting youth aged 0–24 years. First, we searched the internet with various combinations of the search terms used for the peer-reviewed literature. We then intentionally searched the websites of 33 organisations that work on health and gender, which we had identified through a comprehensive web search and our own knowledge of the field (appendix). These organisations included development banks, bilateral and multilateral organisations, international non-governmental organisations (NGOs), and foundations. Through this search, we retrieved 163 potential evaluations. After a deeper screening, we identified 26 distinct programme evaluations from the grey literature that met the same inclusion criteria used for the peer-reviewed articles. Two researchers independently coded key content from each study using the software programme EPPI-Reviewer (appendix); differences were reconciled by a third member of the study team. Using these codes, the team then used simple descriptive statistics to identify trends in programme design, implementation, and evaluation, all with an eye towards how these factors correlated with reported outcomes.

Key features of high-quality gender-transformative programmes

We further categorised programmes that met all inclusion criteria as high quality if they showed evidence of potential for broader norm change and sustained improvements in health:

- Multiplicity: affects outcomes beyond the specific health outcome of focus
- Sustainability: shows measured change at the individual, community, or institutional level that holds promise for lasting improvements in health and gender equality
- Spreadability: addresses discriminatory gender-related attitudes and behaviours that harm health and either directly or indirectly spreads the change or outcome to individuals outside the intervention
- Scalability: has been, or is poised to be, expanded or replicated to cover a larger geographical region or population

21 programmes (25%) enhanced economic stability by building financial literacy and providing access to savings programmes, loans, stipends, incentives, and vocational livelihood training. 29 (34%) focused on the physical environment, providing safe spaces for participants to explore sensitive topics or relax, socialise, and build social networks or capital. More than 50% of the programmes (n=44) used activities to engage men or boys, or both, through activities to improve healthy, interpersonal skills, shift notions of masculinity and promiscuity, redefine household roles and responsibilities, and mitigate acts of violence; only 13 (15%) targeted men and boys alone.

Gender-related mediators and outcomes

Programmes addressed multiple gender inequalities and restrictive gender norms that affect health. To categorise and analyse the variables reflecting these inequalities and norms, we drew from the conceptual framework described in paper 1 of this Series[11] and theoretical frameworks used by the programmes themselves (appendix). Notably, despite their overarching intent to transform norms, and even in cases in which they provided an explicit theory of norm change, evaluations most frequently focused on gender-related activities that worked to improve internal locus of control (n=49, 56%), measuring outcomes such as self-confidence,

self-efficacy, and externally imposed limitations to freedom of movement and age at marriage—which, when entered early, can limit one's decision-making power in the family or community, or both.[25] Changes in gender-related attitudes were measured in more than half of the programmes, although relatively few evaluations measured changes in gender-related knowledge (n=11, 13%). Five evaluations (6%) measured educational attainment, a strong predictor of gender equality at the aggregate level, as a means of improving health (figure 1).

Analysis of what works to transform gender norms and health-related outcomes

We did an additional level of analysis to reflect programmatic evidence of, or potential for, broader norm change: multiplicity, sustainability, spreadability, and scalability (panel 1). From the 85 programmes identified in our search, 41 (48%) measured multiple outcomes, 34 (40%) showed sustainability, 41 (48%) showed evidence of spread, and 32 (38%) were taken to scale or showed the intent to do so. Only 16 programmes met all four criteria and were deemed to have the highest quality (appendix).[26–41] Across these 16, we did a thematic analysis and identified four mutually reinforcing factors: (1) multisectoral action, (2) multilevel, multistakeholder involvement, (3) diversified programming, and (4) social participation and empowerment.

Multisectoral action

Multisectoral action recognises that health outcomes can be effectively and sustainably improved by interventions reaching beyond the health sector.[42] For example, SASA!, a phased community mobilisation intervention to prevent intimate partner violence and reduce HIV-related risk behaviours in Uganda,[31] targeted multiple sectors by collaborating with community activists, traditional marriage counsellors, health-care providers, police officers, and religious, cultural, governmental, and institutional leaders.

Another intervention, the Strengthening Household Ability to Respond to Development Opportunities (known as SHOUHARDO) Project, aimed to reduce child malnutrition in vulnerable areas of Bangladesh.[38] Recognising that child malnutrition derives from a larger system shaped by poverty, food insecurity, and gender inequality, the implementers took a rights-based, livelihoods approach to carry out interconnected activities in the health, education, agriculture, and entrepreneurship sectors.

Multilevel, multistakeholder involvement

Multilevel, multistakeholder involvement includes the participation of stakeholders at different levels of the Social Ecological Model.[43] For example, the TOSTAN programme in Senegal aims to improve women's health and decrease female genital mutilation or cutting and forced early marriage through community empowerment, education, and social mobilisation.[28] To develop critical mass to change these deeply entrenched traditions, programme staff worked with individuals and leaders from the community, the government, civil society, and non-governmental organisations (NGOs).

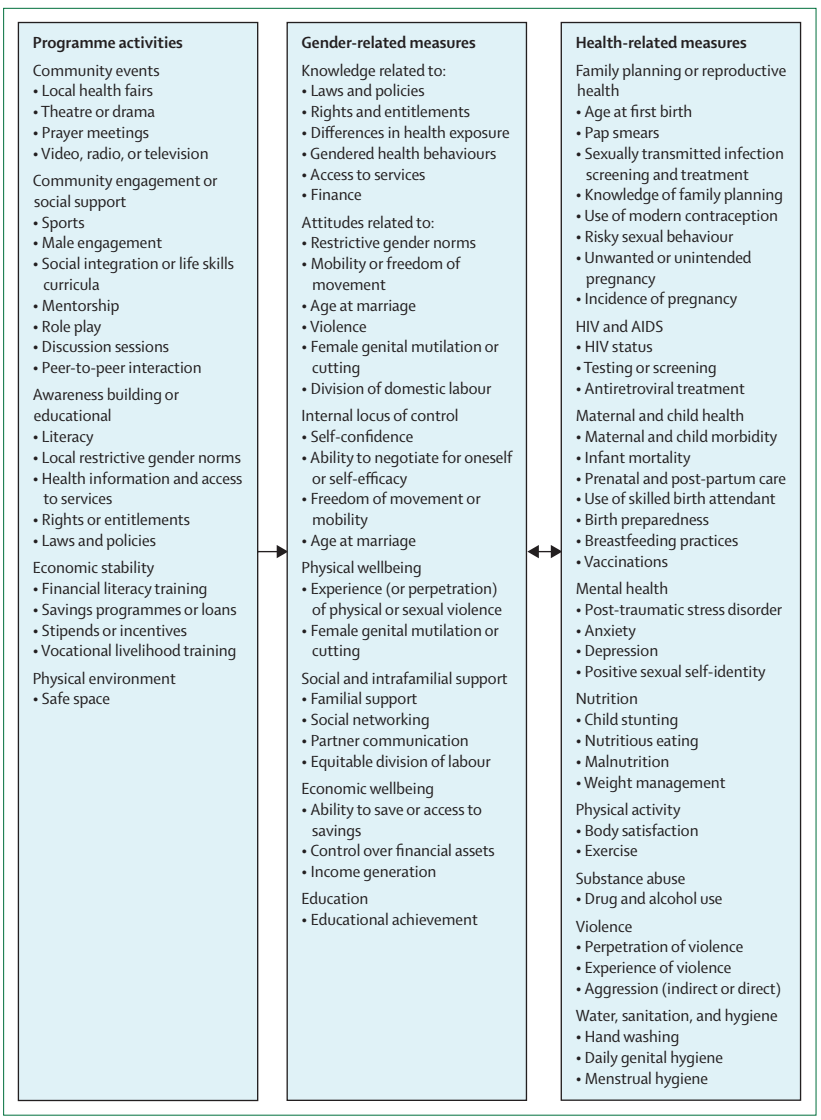

Figure 1: **Activities used by the programmes and the gender-related and health-related measures**

Diversified programming

To effectively target multiple sectors and levels of social participation, activities that reinforce one another and address issues from multiple perspectives must be strategically combined. For example, Somos Diferentes, Somos Iguales (also known as SDSI),[39] a 3-year HIV prevention programme in Nicaragua, aimed to reach multiple actors and address various manifestations of gender inequality and restrictive gender norms through a mass-media campaign involving a soap opera to raise community awareness, a call-in radio show to create a safe space and target youth, a youth leadership camp to develop

peer HIV educators, and the distribution of culturally sensitive materials to target local health providers.

Social participation and empowerment

Finally, to achieve effective, sustainable change, a programme must foster critical awareness and participation in affected community members, encouraging them to become active agents in shaping their own health. One programme in Brazil, Program H, recognised how socially entrenched beliefs and expectations related to masculinity and femininity put the population at greater risk for HIV and other sexually transmitted infections.[36] One example is the belief that men should initiate sexual activity early, have multiple relationships, and maintain control over their partners, whereas women should be submissive and accept sexual requests, even when they are not desired. Considering the power imbalances inherent in these norms, and recognising men's potential role as change agents, Program H implemented participatory education activities to encourage young men to critically reflect on existing inequalities and restrictive gender norms and identify how to actively participate in changing the system.[36] Other programmes, including Stepping Stones in The Gambia[34] and IMAGE in South Africa,[35] used participatory learning and action to raise social consciousness and increase community-level and individual-level agency in improving individual and community outcomes related to sexual and reproductive health, HIV, and violence.

Can laws and policies improve gender norms and health at national scale?

Many strong community-level approaches were apparent in our analyses of programmes that work to transform gender norms and health-related outcomes, but relatively few approaches were available at the national level. Additionally, although the best programmes we assessed effectively moved gender norms, thus changing a key social determinant of health, few programmes addressed other key drivers of gender inequality and restrictive gender norms at a national level, including disparities in educational achievement and work. Given this finding, and widespread gender inequalities in education and work, we now examine whether laws and policies can effectively transform these social determinants of health, gender norms, and health outcomes at a national scale.

New longitudinal analyses

We selected laws and policies, subject to data availability, that have the potential to improve gender equality in education and work for our analyses. We then evaluated whether these law and policy reforms affected health outcomes by reducing gender disparities in household roles. Taking an example in the area of work and income, we examine the impact of paid maternity and parental leave on gender equality in decision making and health outcomes. Evidence has shown that paid maternity and parental leave increase women's labour-force participation after giving birth,[44–50] increase women's economic autonomy,[51] and result in more equal division of housework.[52–55] Although combining adequate paid maternity and paid paternity leave is likely to have the greatest impact on gender norms,[52,53,56–58] too few paternity programmes of substantial length exist in LMICs to enable quasi-experimental studies. As an example in the area of education, we examine national laws and policies making schooling tuition-free, which have been found to powerfully address gender inequalities in school enrolment.[59,60]

Previous research suggests that laws and policies in both areas might also have positive health effects. For example, cross-country studies have shown the associations of paid maternity and parental leave with increased uptake of child vaccination.[61,62] and reduced neonatal, infant, and child mortality.[63,64] However, previous research has not examined whether paid maternity and parental leave affects gender norms or their proxy, or whether changing gender norms is partly responsible for the observed health improvements (or whether these improvements occur entirely through mechanisms unrelated to gender equality, such as facilitating breastfeeding). Similarly, research in various countries has shown that tuition-free primary education laws and policies are associated with positive health outcomes, including reduced infant and neonatal mortality.[65] In this case, too, previous research has not examined whether the laws and policies lead to greater gender equality and whether this equality contributes to health improvements. We extend the health outcomes studied, examine the reforms' impact on gender equality in decision making and whether this proxy for norms mediates the effect on health.

In two quasi-experimental studies designed to examine causality, we analysed the effects of paid maternity and parental leave laws and policies and tuition-free primary education laws and policies, comparing families' experiences over time in countries with and without these reforms. Exposure to tuition-free education laws and/or policies was defined by whether individuals had been born in time to have access to tuition-free education upon reaching age of entry to primary school. Exposure to paid maternity and parental leave laws and/or policies was defined as the number of weeks of legislated paid maternity and parental leave available in the year before women last gave birth. In some, but not all, countries, maternity and parental leave cover the informal as well as the formal economy.

Data

For each country under study, we retrieved data on the availability of tuition-free primary education from a database compiled by the WORLD Policy Analysis Center (known as WORLD) at the University of California, Los Angeles, CA, USA.[66] The information in WORLD's database was largely derived from original legislation and policy documents available through the UN Educational,

Scientific, and Cultural Organization's Observatory on the Right to Education.[67] The Policy Relevant Observational Studies for Population Health Equity and Responsible Development (known as PROSPERED) project[68] at McGill University (Montreal, QC, Canada) and WORLD provided data on nationally legislated weeks of maternity and parental leave, and the control variable of paid paternity leave from 1995 to 2016.

Panel 2: Sample, variables, and statistical methods of longitudinal law and policy analyses

Sample

Current globally comparative surveys on health provide substantially more information on the health of women and children than on the health of men.[12] The best survey data available on the subject of this Series paper—data that combine nationally representative measures of health outcomes and of proxies for gender norms—are found in the Demographic and Health Surveys (DHS). However, information in DHS on the health of men is insufficient, which constrains our analyses of gender norms and their impacts on the health of women and children.

Our base sample consisted of 693 343 married or cohabiting women for the study of tuition-free primary education laws and policies across 23 countries, and 697 048 married or cohabiting women with children born since 1996 for the study of paid maternity and parental leave across 22 countries. Both datasets included countries with recent law or policy reforms (treatment countries) and those without law or policy changes (control countries). When assessing children's health outcomes, we included women with singleton children born within 1 year before survey administration. When examining children's immunisation status, we further restricted the sample to living children.

Tuition-free primary education laws and policies:

- Treatment countries: Armenia, Cambodia, Dominican Republic, Egypt, Ghana, Lesotho, Malawi, Mali, Nepal, Senegal, Tanzania, Uganda, Zambia
- Control countries: Benin, Colombia, Haiti, Indonesia, Kenya, Namibia, Nigeria, Philippines, Rwanda, Zimbabwe

Paid maternity and parental leave laws and policies:

- Treatment countries: Bangladesh, Colombia, Lesotho, Malawi, Uganda, Zambia, Zimbabwe
- Control countries: Benin, Egypt, Ethiopia, Ghana, Haiti, Indonesia, Jordan, Mali, Nepal, Nigeria, Peru, Philippines, Rwanda, Senegal, Tanzania

Variables

Restricting the samples to married or cohabiting women was necessary because our proxy for gender norms, a key variable, was based on distributions of household decision-making authority between women and their husbands, male partners, and others. Drawing on the hypothesis in the social norms literature that norms activate behaviour,[69] we created our proxy for gender norms on the basis of women's responses to the following DHS questions: "Who usually makes decisions about health care for yourself?", "Who usually makes decisions about making major household purchases?", and "Who usually makes decisions about visits to your family or relatives?" The wording of the questions varied slightly in phase 4 of the DHS (appendix). Responses to these questions were categorised as: respondent, husband or partner, respondent and husband or partner jointly, someone else, respondent and someone else jointly, and decision not made or not applicable. Our proxy for gender norms was an indicator variable that took a value of 1 if women reported having sole or joint decision-making power (with her husband, partner, or someone else) in all three questions mentioned; otherwise, it took a value of 0.[70] We examined whether our results were sensitive to the proxy measure used for norms by repeating the analyses with different proxy measures and found similar results (appendix).

For these studies, we focused on two health indicators each for women: (1) women's met need for family planning (indicating the use of family planning to space or reduce future births) and (2) women's use of modern contraceptives (instead of traditional or folkloric contraception methods); and for children: (1) a skilled health provider's attendance at the delivery of the last child, born within 12 months before the survey and (2) children's full, age-appropriate immunisation status (indicating that children received the BCG, diphtheria–pertussis–tetanus, polio, and measles immunisations appropriate for their ages, based on the recommendation of WHO).

Statistical methods

To estimate the effects of tuition-free primary education law or policy and paid maternity and parental leave law or policy on health outcomes and gender norms, we used a generalised difference-in-difference approach.[71] Exploiting the variation in law and policy reform timings across countries, we first examined whether exposure to laws and policies in these two areas had significant effects on health outcomes and on gender norms. Changes in outcomes in countries with law or policy reforms (treatment) before and after law or policy exposure were compared with corresponding changes in countries without these reforms (control). Next, we used the product method to calculate the extent to which law-induced and policy-induced changes in gender norms mediated the laws' and policies' effects on health outcomes. Finally, we used the Sobel mediation test to examine whether these mediated effects were significant.[72]

All estimations took into account individual-level sampling weights and the DHS sampling design. They also included individual-level and country-level control variables, appropriate for each outcome, as well as year and country fixed effects to reduce confounding bias. Robustness checks of these estimations, appropriate for each law and policy under study, are described in the appendix.

We obtained individual-level data from countries where the nationally representative Demographic and Health Surveys (DHS) had been administered at least three times since 1999, the earliest year women were asked about their participation in household decision making. Fewer countries surveyed men on this topic (panel 2; appendix).

Results of longitudinal law and/or policy analyses: impact on gender roles in decision making and on health outcomes

Exposure to an additional 10 weeks of paid maternity and parental leave substantially increased the odds of better women's and children's health outcomes, particularly use of modern contraception methods, relative to women with no exposure (OR 1·34–2·10; table 1). Exposure to tuition-free primary education laws and/or policies substantially increased women's likelihood of completing primary school (appendix), and substantially increased women's and their children's likelihood of having better health outcomes (OR 1·16–1·62), relative to women with no such exposure during their childhood (table 1). Relative to no exposure, exposure to tuition-free education throughout primary school or a 10-week increase of paid maternity and parental leave increased women's likelihood of having sole or joint decision-making power by 45·6% and 45·4%, respectively (table 1).

In summary, women's exposure to both laws and/or policies significantly enhanced women's and children's health outcomes and pushed our proxy for gender norms to be more gender-equitable. Analyses with different formulations of the norm proxy yielded similar results (appendix). Additional associational evidence suggests that the effects of greater gender equality in household decision making, our norm proxy, might extend to a wide range of health knowledge and behaviours (appendix).

Health impact augmented by more gender-equitable roles

We also investigated whether these law-induced and/or policy-induced changes in the proxy for gender norms helped account for the reforms' health benefits. For each health outcome, we report both the direct and the indirect (ie, mediated by the norm proxy) effects of law and/or policy exposure (table 2).

Exposure to both laws and/or policies had not only significant and positive direct effects on health outcomes, but also significant and positive indirect effects, showing that gender norm change augmented the laws' and/or policies' health benefits. The magnitude of the mediating effect of changing norms on these four health outcomes was modest relative to the law and/or policy changes' direct effects.

Examining global adoption of educational and labour laws and policies

Given the effectiveness of these educational and labour laws and/or policies at improving gender equality and multiple health outcomes, their global adoption should be examined. Our analysis of their current state of adoption in all 193 UN countries revealed important progress and concerning gaps for both laws and/or policies. Seven countries worldwide have not adopted tuition-free primary education laws and/or policies, and 32 have not committed to providing tuition-free secondary education through completion (figure 2). Children overall, and particularly girls (who are disproportionately kept out of school by cost and other barriers in low-income households), face substantial obstacles to education in these nations, with deleterious consequences for household gender equality and health. Meanwhile, eight countries do not provide paid leave to mothers and parents of infants, and 84 do not provide paid leave to new fathers with similarly important implications for health and gender equality.

Examining potential for health improvements from a broader array of laws and policies increasing gender equality in education and work

Although our quasi-experimental studies focused on legislated guarantees of tuition-free primary education and paid maternity and parental leave, other initiatives that change restrictive gender norms and promote gender

	Model 1: met need for family planning	Model 2: modern contraceptive use	Model 3: skilled attendant at birth	Model 4: up-to-date child immunisation	Model 5: proxy for gender norms
Tuition-free primary education					
Sample size	414 689	287 622	115 648	111 690	598 598
OR (95% CI)	1·58 (1·42–1·75)	1·62 (1·30–2·01)	1·22 (1·02–1·47)	1·16 (0·99–1·34)	1·46 (1·34–1·58)
p value	<0·0001	<0·0001	0·032	0·059	<0·0001
10-week increase of paid maternity and parental leave					
Sample size	472 328	338 118	150 163	145 110	683 389
OR (95% CI)	1·34 (1·23–1·46)	2·10 (1·82–2·42)	1·42 (1·22–1·65)	1·69 (1·49–1·93)	1·45 (1·35–1·56)
p value	<0·0001	<0·0001	<0·0001	<0·0001	<0·0001

All models are weighted and adjusted for area of residence, women's marital status and age, partners' age, survey year fixed effects, and country fixed effects. Models also control for topic-specific factors including partners' education, household assets, public health expenditure, women's birth month and year fixed effects, children's year of birth fixed effects, per capita growth of gross domestic product, and child's age, gender, and birth order when relevant (appendix). OR=odds ratio.

Table 1: **Effects of laws and policies in two areas on selected health outcomes and proxy for gender norms**

	Model 1: met need for family planning	Model 2: modern contraceptive use	Model 3: skilled attendant at birth	Model 4: up-to-date child immunisation
Tuition-free primary education				
Sample size	414 689	287 622	115 648	111 690
Direct effect of exposure to law and/or policy				
Percentage point (95% CI)	0·071 (0·051–0·090)	0·043 (0·030–0·056)	0·030 (0·000–0·059)	0·044 (0·010–0·077)
p value	<0·0001	<0·0001	<0·0001	<0·0001
Indirect effect through norm proxy				
Percentage point (95% CI)	0·002 (0·001–0·003)	0·001 (0·000–0·001)	0·003 (0·001–0·004)	0·001 (0·000–0·002)
p value	<0·0001	<0·0001	<0·0001	0·0029
10-week increase of paid maternity and parental leave				
Sample size	472 328	338 118	150 163	145 110
Direct effect of exposure to law and/or policy				
Percentage point (95% CI)	0·065 (0·048–0·081)	0·032 (0·021–0·044)	0·071 (0·046–0·096)	0·116 (0·088–0·143)
p value	<0·0001	<0·0001	<0·0001	<0·0001
Indirect effect through norm proxy				
Percentage point (95% CI)	0·0008 (0·0005–0·0012)	0·0007 (0·0003–0·0010)	0·0017 (0·0010–0·0025)	0·0008 (0·0001–0·0014)
p value	<0·0001	<0·0001	<0·0001	0·0233

All models are weighted and adjusted for area of residence, women's marital status and age, partners' age, survey year fixed effects, and country fixed effects. Models also control for topic-specific factors including partners' education, household assets, public health expenditure, women's birth month and year fixed effects, children's year of birth fixed effects, per capita growth of gross domestic product, and child's age, gender, and birth order when relevant (appendix). p values for the indirect effect were calculated with the Sobel test.

Table 2: **Results of mediation analyses showing direct and indirect effects of laws and policies in two areas on selected health outcomes**

equality in education and work are also likely to affect health. For example, many laws and policies affecting advancement in, and the quality of, education and work might dramatically affect gender equality. Although data were not available to examine these laws and policies in quasi-experimental studies, to provide a preliminary analysis of such interventions' potential magnitude of impact, we examined the associations of gender equality in work and education with health outcomes. Educational parity (defined as the normalised average product of a country's female-to-male enrolment ratios and female enrolment rates across primary, secondary, and tertiary education) was significantly associated with improved health outcomes around the world, even after controlling for country per-capita gross domestic product (GDP), urban population, unemployment rate, and domestic government health expenditures as a percentage of GDP. A 10% increase in our educational parity index—equivalent to only a 4·9% increase in girls' gross annual school enrolment—was associated with a 2·06-year increase in female life expectancy, and a 0·88-year increase in male life expectancy at birth (appendix).

Effects were also observed following regression of these outcomes on a work parity index (the normalised product of mean female-to-male ratios of professional, technical, and managerial workers and total female labour-force participation). A 10% increase in the index—equivalent to a 10% increase in female labour-force participation—was significantly associated with a 0·91-year increase in female life expectancy at birth (appendix).

Measuring the effects of diverse laws and policies that can promote gender equality in education and work, as well as other social determinants of health, will be essential steps in planning future legislative and policy initiatives and promoting health.

Gaps and limitations

Several important limitations of these studies should be noted. Our review of programme evaluations was not restricted by health outcome, age, or geographic area. Therefore, feasibility required limiting the review to quantitative and mixed-methods studies with experimental and quasi-experimental designs, which are suitable for examining causal effect. Potentially high-quality programmes that were evaluated solely with qualitative or other non-experimental methods were not included. Also, the use of experimental designs limits findings' generalisability if experimental conditions differ from common implementation conditions or if the experiments were done in settings with unique characteristics.

In addition to review of qualitative evaluations, more research is needed on interventions that spread change and are sustained over time. In our group of studies, just 6% examined the programmes' impact 3 years or more after programme completion. The dynamic, complex nature of gender inequalities and restrictive gender norms demands long-term, systems-informed approaches to impact on evaluation for full assessments of programme impact across broad-ranging health and gender-related outcomes.

Quasi-experimental designs depend on studying what has been tried, and our law and policy studies were constrained by the paucity of countries that have passed

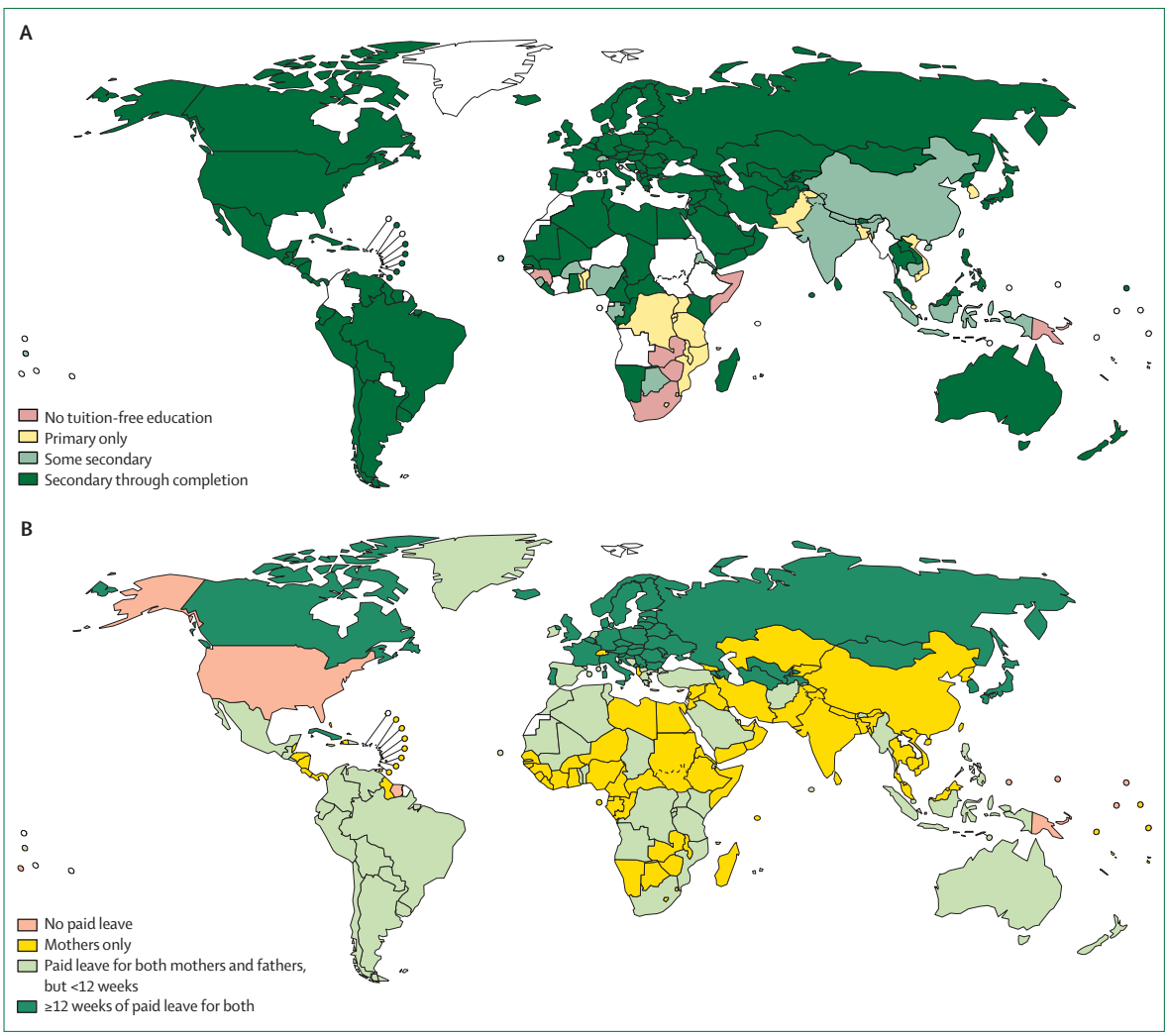

Figure 2: **Laws and policies surrounding tuition-free education (A) and paid parental leave (B) worldwide**
We created maps using data from the Education Database 2014 (A) and Adult Labor Database 2015–16 (B) of the WORLD Policy Analysis Center.

laws and policies in the areas where restrictive gender norms most strongly affect men. For example, we were unable to study the impact of multi-month paid paternity leave in LMICs because there are insufficient LMICs with mid-length or lengthy paid paternity leave. Although we examined the mediating effects of decision-making roles, a proxy for gender norms, on health outcomes, we were unable to examine norms directly because the DHS do not collect data on norms. Moreover, our studies were not designed to measure a possibly larger mediating effect: the creation of environments in which further laws, policies, and programmes supporting gender equality and health are passed and implemented.

The health outcomes we could study were also insufficient. Laws and policies might have health effects across multiple sectors. Comparative surveys across LMICs collect more data on reproductive and child health outcomes than on non-reproductive adult health outcomes. Adding measures of gender norms and more adult health outcomes to health-focused comparative surveys, including DHS, would be invaluable.

We examined the decision-making autonomy and health outcomes of women because they are most often disadvantaged by gender inequality. Although we would have liked to examine how restrictive gender norms also affect men's health, the DHS do not collect adequate data on men's health. Additionally, the DHS' lack of individual-level panel data restricted our ability to control for potential unobserved individual confounders. Models do control for known individual-level confounders.

Discussion

Our findings make clear that well designed and implemented laws, policies, and programmes can both transform norms and improve health. The effective interventions include those explicitly focused on transforming restrictive gender norms and those known to

increase equal opportunities across sex and gender, whether or not that is the stated objective. Successful examples of increasing equal opportunities include lowering cost barriers to education for everyone, which disproportionately benefits girls who were previously more likely to be unenrolled, and increasing economic opportunities for women by addressing their disproportionate caregiving burden.

Although the studies discussed here show the feasibility of markedly advancing equality and making norms, attitudes, and behaviours more equal, the passage and successful implementation of these laws, policies, and programmes depend on the political leadership and governance mechanisms in place in a particular setting. Without amenable institutional environments or adequate budgets, interventions might either never materialise or lack consistent, long-term implementation.

Increasing gender parity in political participation can support the passage and implementation of these interventions. Several LMICs (eg, Argentina, Senegal, Rwanda, Bolivia, and India) have attempted affirmative action to improve women's representation in politics. Affirmative action in India increased gender parity in lower echelons of governance, and effects on various outcomes have been rigorously evaluated. The landmark 73rd Constitutional Amendment Act of 1993 reserved for women a third of all seats in panchayat raj (local self-governance structures). Since then, women's increased participation in political decision making—an important indicator of gender equality[73]—has supported the formation and enforcement of laws and policies shaping health and gender norms. Increases in shares of women politicians had a substantial effect on the delivery of public health (increased number of primary health centres, community health centres, government dispensaries, and government hospitals) and health outcomes, including reductions in neonatal mortality.[74] Furthermore, studies have linked more equal political representation to shifts in gender-related attitudes and expectations, with wide-ranging benefits for individuals and communities, including positive health outcomes for women and girls. Exposure to women leaders in West Bengal over several electoral cycles mitigated voter prejudices and stereotypes about gender roles in public offices.[75] Using the same data, another study[76] found substantive reductions in the gender gap in parents' aspirations for adolescents and the adolescents' aspirations for themselves, as well as a closing of the gap in educational attainment between boys and girls.[76] Girls of higher birth order in rural India were more likely to survive in the presence of local-level political reservations for women, a result that was attributed to reduced preference for sons,[77] and law enforcement was found to be more responsive to crimes against women, and women more likely to report crimes, in the presence of female political representation.[78]

Country experiences also show the importance of adequate budgets and monitoring mechanisms for effective implementation of laws, policies, and programmes.[79] Rwanda offers an example of an approach to this issue. Article 4 of Rwanda's 2013 Organic Law on state finances and property[80] lists gender balance in public State finance management among six fundamental principles of public finance management, whereas Article 68 requires all public entities to submit annual activity reports specifying how plans for gender balance have been implemented. In 2008, the Ministry of Finance and Economic Planning published a technical guide to provide a step-by-step framework for addressing gender inequalities in budgeting processes.[81] The Rwandan Government has also established a Gender Monitoring Office to track compliance with the country's national, regional, and international gender equality-related commitments. As a reference point for information on gender equality in Rwanda, the Gender Monitoring Office is mandated to monitor the respect of gender equality principles, promote gender accountability at all levels, and combat gender-based violence and related injustices. Evidence for the impact of these finance and governance reforms is forthcoming.

In Namibia, Gender Responsive Budgeting Guidelines have been developed by the Ministry of Gender Equality and Child Welfare, and the National Development Plan, NDP5, demands that all implementing institutions include indicators that are well defined, classified, and disaggregated by sex. Despite the political commitment to gender budgeting in both countries, much remains to be achieved in practically implementing the guidelines, delivering on planned objectives, and narrowing gender gaps in various aspects including health.[82]

Although much more research remains to be done, decision makers have ample evidence about what works to improve health and economic outcomes by addressing gender inequality and restrictive social norms. Policy makers need to take the steps that have been proven to reduce discrimination and increase gender equality in education, work, and income, each a social determinant of health. As we have shown, tuition-free primary education laws and policies, and paid maternity and parental leave laws and policies have led to both increased decision-making roles for women and improvements in women's and children's health. Additionally, our findings suggest that more broadly increasing gender equality in education can lead to improvements in both women's and men's health.

To ensure long-term norm change and health improvements, particular attention should be paid to programmes that take a multisectoral and multilevel approach, extending efforts beyond the health sector and from the community to national level. Finally, we need to pave the way for successful laws, policies, and programmes by ensuring that opportunities for leadership positions are equal, leaders are held accountable, and budgets are distributed equally.

Importantly, interventions at each level—public policy and law, programmes, and governance—are synergistic. For example, laws and policies that address inequalities can make it more likely that all people will advance in education, and that every person has an equal opportunity to succeed at work and serve in leadership positions. Greater equality in public-sector and private-sector leadership positions can, in turn, increase support for programmes that transform, rather than reinforce, restrictive gender norms that perpetuate inequality. Simultaneously improving gender equality and health is within reach if we have the will.

Contributors

JH conceived, designed, and oversaw the law and policy studies; contributed to the design of the comprehensive review and governance studies; designed the conceptual framework for the paper; and drafted and revised the manuscript. JKL and MEG conceived, designed, and conducted the comprehensive review; drafted and revised the section on the comprehensive review (JKL was lead author of this section); and reviewed and edited the full manuscript. BB and VR-S designed and conducted the analyses of the impact of tuition-free education laws and policies, and paid parental leave laws and policies; they wrote and revised the section on the impact of education law and policy, and parental leave law and policy on health and norms. YM and HS conceived and drafted the governance case studies and contributed to the design of, and provided critical feedback on, the full manuscript. NO analysed the association across countries between greater gender equality in decision making and population health outcomes; she wrote and revised the relevant section of the paper. AG designed and conducted the analyses of the association between greater gender parity in education and work and population health; she wrote and revised the corresponding section of the paper. KH collaborated on the development of the conceptual framework for the manuscript, contributed to the interpretation of the findings, and led the editing of the full manuscript. GLD conceived of this Series and the role of this manuscript in the Series, conceived and contributed to the design of the comprehensive review, and edited the full manuscript.

Steering Committee of the *Lancet* Series on Gender Equality, Norms, and Health

Gary Darmstadt (chair), Margaret Greene, Sarah Hawkes, Lori Heise, Sarah Henry, Jody Heymann, Jeni Klugman, Ruth Levine, Anita Raj, Geeta Rao Gupta.

Declaration of interests

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