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# Gender inequalities in health and wellbeing across the first two decades of life: an analysis of 40 low-income and middle-income countries in the Asia-Pacific region

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## Summary

**Background** By adulthood, gender inequalities in health and wellbeing are apparent. Yet, the timing and nature of gender inequalities during childhood and adolescence are less clear. We describe the emergence of gender inequalities in health and wellbeing across the first two decades of life.

**Methods** We focused on the 40 low-income and middle-income countries in Asia and the Pacific. A measurement framework was developed around four key domains of wellbeing across the first two decades: health, education and transition to employment, protection, and a safe environment. Specific measurement constructs were then defined by considering gender indicator frameworks, the Sustainable Development Goals, indicator frameworks for child and adolescent health and wellbeing, and key stakeholder input. Available data were then mapped to define 87 indicators, subsequently populated using databases (UN agencies and the Global Burden of Diseases, Injuries, and Risk Factors Study) and nationally representative surveys. Where possible, estimates in girls were compared with boys to report relative risks.

**Findings** Although son preference is evident in some settings—as shown by higher than expected male-to-female sex ratios at birth in India, Vietnam, and China (all >1.10 compared with an expected ratio of 1.05) and excess mortality of girl children in some South Asian and Pacific nations—it is during early adolescence where marked gender inequalities consistently emerged. Adolescent girls face considerable disadvantage in relation to sexual and reproductive health (notably in South Asia and the Pacific), with high rates of child marriage ( $\geq 30\%$  of women aged 20–24 years married before 18 years in Bangladesh, Nepal, and Afghanistan), fertility ( $\geq 65$  livebirths per 1000 girls in Nauru, Laos, Afghanistan, Nepal, Marshall Islands, Bangladesh, Vanuatu, and Papua New Guinea), and intimate partner violence ( $>20\%$  in Timor Leste, Afghanistan, Pakistan, and Myanmar). Despite educational parity in many countries, females aged 15–24 years were less likely than males to be in education, employment, or training in 17 of 19 countries for which data were available. Compared with girls, adolescent boys experienced excess all-cause mortality and substantially higher mortality due to unintentional injury, interpersonal violence, alcohol and other drugs, and suicide, and higher prevalence of harmful drinking and tobacco smoking.

**Interpretation** These findings call for a focus on gender policy and programming in later childhood and early adolescence before gender inequalities become embedded.

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## Introduction

Gender powerfully shapes all aspects of health and wellbeing. Socially and culturally constructed gender norms determine roles and opportunities for all people, affecting social and structural determinants of health, health risk behaviours, and access to and quality of health and social services.<sup>1</sup> As a result, restrictive and harmful gender norms, values, and expectations result in inequalities in health and wellbeing that extend across the life course and across generations. For these reasons, gender equality is an explicit goal of the 2030 Agenda for Sustainable Development.<sup>2</sup> This has triggered efforts to measure gender equality, and a proliferation of indicators to identify where inequalities exist and to

inform policy investments. Substantial and persistent gender inequalities among adults have been well documented,<sup>2,3</sup> with available indices showing marked societal gender inequality in many settings, particularly the Asia-Pacific region.<sup>4</sup>

The recent *Lancet* series on gender equality, norms, and health emphasised the cumulative effects of gender inequality across the life course, and identified later childhood and adolescence as an important phase in the “social production of gender”.<sup>1,3</sup> The relative lack of effective measures of gender inequality during the first two decades of life was noted as a major barrier to progress in gender equality and sustainable development.<sup>5,6</sup> Existing gender measurement frameworks, including the

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## Research in context

### Evidence before this study

The 2019 *Lancet* Series on Gender Equality, Norms, and Health identified childhood and adolescence as a key developmental window to address gender equality across the life course. Not only is this when gender norms and roles are formed, but when gender inequalities first emerge. The Series also noted that effective measures of gender inequality during the first two decades of life were lacking, a major barrier to progress. To identify existing indicators for gender equality relevant to childhood and adolescence we reviewed the UN Statistical Commission Global Minimum Set of Gender Indicators; UN Economic and Social Commission for Asia and the Pacific Core Set of Gender Indicators for Asia and the Pacific (in draft at the time of review); the Beijing Platform for Action; the UNICEF Gender Action Plan; and the Asian Development Bank's report on Gender Equality and the Sustainable Development Goals in Asia and the Pacific. Furthermore, we reviewed the Sustainable Development Goals (including indicators relating to goal 5), and indicator frameworks for child and adolescent health and wellbeing more broadly, mapped as part of the *Lancet* Commission on Adolescent Health and Wellbeing. Our review identified indicators that measured aspects of sexual and reproductive health and rights for girls (such as child marriage) and educational enrolment. There has also been measurement of gender disparity in self-harm among adolescents, with sex-specific estimates for headline indicators for adolescent health also recently published in *The Lancet*. However, gender-relevant indicators for other elements of wellbeing were lacking, and particularly so for children, younger adolescents, and males.

### Added value of this study

To our knowledge, this is the first systematic analysis of gender inequality across childhood and adolescence. We define a

comprehensive reporting framework for gender inequality across the first two decades of life, harmonised with global measurement efforts relating to gender and data available for children and adolescents. We describe gender inequalities that emerge across the developmental continuum, gender inequalities for indicators that are age-specific, and estimates of indicators that are gender-specific and age-specific. We also provide a full set of contemporary estimates for the 87 included indicators for 40 low-income and middle-income countries in Asia and the Pacific. In combination, these data help to identify what gender inequalities exist across childhood and adolescence and when these emerge.

### Implications of all the available evidence

These findings substantially extend our understanding of gender inequality during childhood and adolescence and challenge the narrow focus on women in existing gender indicators, policies, and programmes. While some key inequalities exist preconceptually and during infancy relating to son preference, it is during early adolescence where marked gender inequalities emerge. Girls in this region continue to experience considerable disadvantage across sexual and reproductive health and rights, with boys experiencing increased health risks and outcomes relating to injury and violence. This analysis also highlights the substantial regional and national variation in the impacts of gender inequality, emphasising the need for context-specific measurement, programming, and policy. For example, child marriage (a traditional focus of programming and investment) is comparatively low in central Asia, but adolescent girls in this region are at excess risk of binge drinking compared with girls in other settings. These findings together highlight the need to invest in this developmental window to assure gender equality across the life course.

Sustainable Development Goals (SDGs), are primarily focused on adult women, consistent with the substantial inequality and harmful consequences that women face.<sup>7</sup> These frameworks, however, have a narrower focus on girls, with the effects of gender inequality beyond education and sexual and reproductive health poorly measured. There has also been very little attention to how gender norms affect boys and men.<sup>3,8,9</sup> These knowledge gaps serve as key barriers to effective gender policy for children and adolescents; more evidence is needed around when and where to target programmes and investments relating to gender equality in the first two decades of life.<sup>10,11</sup>

To address this gap, we have developed and populated a framework focused on measurement of gender inequality across the first two decades of life to understand where gender inequalities exist and to characterise their nature.

## Methods

### Overview of the study

We did a systematic analysis of population data to report gender inequalities across the first two decades of life. Our

focus was 40 low-income and middle-income countries in Asia and the Pacific across the four UNICEF subregions (Pacific, East and Southeast Asia, South Asia, and Central Asia). Asia and the Pacific are home to more than half of the world's 2.3 billion 0–18 year-olds, with substantial variation in societal gender inequality and development as measured by the Human Development Index, Social Institutions Gender Index, and Gender Inequality Index (appendix pp 2–3).<sup>12</sup> In the absence of agreed indicators, we adapted the conceptual framework of the *Lancet* Series on Gender Equality, Norms, and Health and the *Lancet* Commission on Adolescent Health and Wellbeing for the measurement of gender inequality for children and adolescents.<sup>13,14</sup> We then mapped available data against the measurement framework to define indicators and report gender inequalities.

### Measurement framework

The measurement framework focused on gender inequality in health and wellbeing for children and adolescents (aged 0–19 years). It was framed around four

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key domains reflecting the key overarching goals of UNICEF's strategic plan (which is anchored in the Convention on the Rights of the Child and SDGs) and also aligned with key concepts of wellbeing: every child survives and thrives (health), every child learns (education and transition to employment), every child is protected from violence and exploitation (protection), and every child lives in a safe and clean environment (safe environment; figure 1).<sup>14,15</sup> Subdomains and specific elements (measurement constructs) were then defined by considering existing gender inequality frameworks,<sup>16–18</sup> indicators of the SDGs,<sup>19</sup> existing global and regional indicator frameworks for child and adolescent health and wellbeing,<sup>15,20–22</sup> and the input of key stakeholders (appendix p 4). Domains and subdomains included in the measurement framework are shown in figure 1.

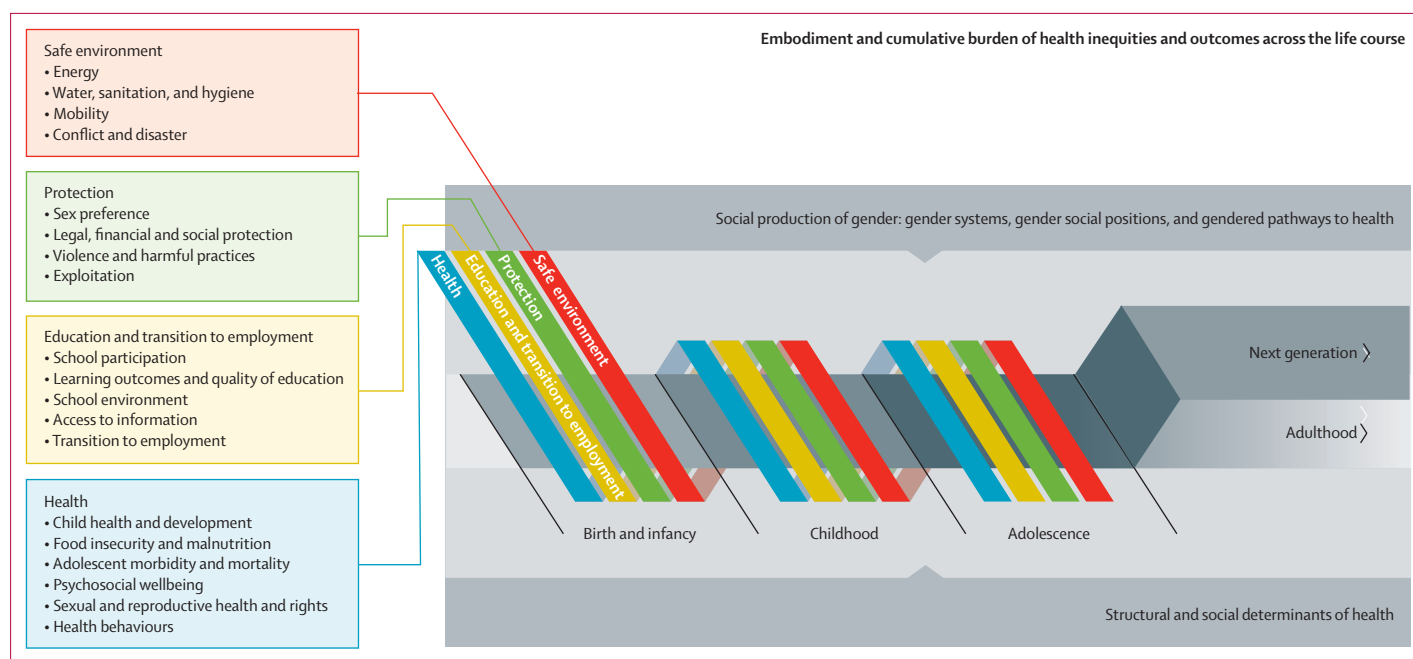
### Mapping available data and defining indicators

The criteria and process for selecting and defining indicators are described in the appendix (pp 5–6). We sought to define indicators that were conceptually clear, measuring an area of importance with respect to gender equity, and were able to be populated with available data. Indicators were reviewed and endorsed by key stakeholders (appendix p 4). There were three broad groupings of measures that emerged: those available across the first two decades of life and across genders (eg, mortality rate), measures available for both girls and boys but only for a specific age group (eg, completion of secondary school), and gender-specific measures

(eg, adolescent fertility rate, demand for contraception satisfied). Due to few data for non-cisgender or non-binary identity, analysis was based on reported, sex-disaggregated comparisons between girls and boys.

### Data analysis and reporting

We reported estimates as defined by each indicator for children (0–9 years of age) and adolescents (10–19 years of age) in 5-year age groups, corresponding to early and late childhood and adolescence, respectively.<sup>23</sup> For indicators with estimates across genders, we compared the measure in girls with that in boys and reported as incidence rate ratios (IRRs) or as risk ratios for prevalence measures, which we collectively term relative risks (RRs); an RR greater than 1 denotes the outcome is greater in girls. For indicators that were gender-specific, we reported estimates across countries in each region. For these indicators, we identified the lowest and highest observed values, and ranked each country in between on a continuous scale, presenting this ranking as a heat map. Uncertainty estimates for data drawn from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2017 were included (appendix pp 7–76), but SEs for primary data drawn from global datasets were not available and we were unable to calculate CIs. Available data were sex disaggregated, and given that most surveys conflate sex and gender,<sup>24</sup> we have assumed sex to represent gender for this analysis. Data were analysed in STATA MP (version 14.2) and visualised using ggplot2 in R (version 3.6.3; Rstudio version 1.3.1073).



**Figure 1: Conceptual measurement framework for impacts of gender inequality on the wellbeing of children and adolescents**

This figure shows how gender systems and structures interact with the social determinants of health (adapted from the *Lancet* Series on Gender Equality, Norms and Health<sup>13</sup>) to impact on health and wellbeing across the life course (*Lancet* Commission on Adolescent Health and Wellbeing<sup>14</sup>). The measurement framework of this study (shown to the left in four coloured boxes) focuses on impacts on gender inequality on four core domains of wellbeing across childhood and adolescence (adapted from the UNICEF strategic plan<sup>15</sup> and the *Lancet* Commission<sup>14</sup>).

**Role of the funding source**

This study was primarily funded by UNICEF with resource contributions from the UN Population Fund, UN Women, UN Food and Agriculture Organization, Plan International,

and World Food Programme. These partners, together with other key stakeholders (UN Development Programme and UN Economic and Social Commission for Asia and the Pacific, detailed in appendix p 4), contributed to the

Definition	Data source*	Year	Country coverage	Population coverage†
<b>Health</b>				
<b>Morbidity and mortality</b>				
1.1.01 YLD rate due to all causes by 5-year age group and sex (YLDs per 100 000 per population per year)	GBD	2017	85%	100-00%
1.1.02 Mortality rate due to all causes by 5-year age group and sex (deaths per 100 000 per population per year)	GBD	2017	85%	100-00%
1.1.03 YLDs due to CMNN diseases by 5-year age group and sex (YLDs per 100 000 per population per year; GBD cause A)	GBD	2017	85%	100-00%
1.1.04 Mortality due to CMNN diseases by 5-year age group and sex (deaths per 100 000 per population per year; GBD cause A)	GBD	2017	85%	100-00%
1.1.05 YLDs due to STIs by 5-year age group and sex (YLDs per 100 000 per population per year); subset of CMNN (GBD cause A.1.2)	GBD	2017	85%	100-00%
1.1.06 Mortality due to STIs by 5-year age group and sex (deaths per 100 000 per population per year); subset of CMNN (GBD cause A.1.2)	GBD	2017	85%	100-00%
1.1.07 YLDs due to HIV by 5-year age group and sex (YLDs per 100 000 per population per year); subset of CMNN (GBD cause A.1.1)	GBD	2017	85%	100-00%
1.1.08 Mortality due to HIV by 5-year age group and sex (deaths per 100 000 per population per year); subset of CMNN (GBD cause A.1.1)	GBD	2017	85%	100-00%
1.1.09 YLDs due to nutritional disorders by 5-year age group and sex (YLDs per 100 000 per population per year); subset of CMNN (GBD cause A.7)	GBD	2017	85%	100-00%
1.1.10 Mortality due to nutritional disorders by 5-year age group and sex (deaths per 100 000 per population per year); subset of CMNN (GBD cause A.7)	GBD	2017	85%	100-00%
1.1.11 YLDs due to NCDs by 5-year age group and sex (YLDs per 100 000 per population per year; GBD cause B)	GBD	2017	85%	100-00%
1.1.12 Mortality due to NCDs by 5-year age group and sex (deaths per 100 000 per population per year; GBD cause B)	GBD	2017	85%	100-00%
1.1.13 YLDs due to alcohol and other drugs by 5-year age group and sex (YLDs per 100 000 per population per year); subset of NCDs (GBD cause B.7)	GBD	2017	85%	100-00%
1.1.14 Mortality due to alcohol and other drugs by 5-year age group and sex (deaths per 100 000 per population per year); subset of NCDs (GBD cause B.7)	GBD	2017	85%	100-00%
1.1.15 YLDs due to mental disorders by 5-year age group and sex (YLDs per 100 000 per population per year); subset of NCDs (GBD cause B.6)	GBD	2017	85%	100-00%
1.1.16 Mortality due to mental disorders by 5-year age group and sex (deaths per 100 000 per population per year); subset of NCDs (GBD cause B.6)	GBD	2017	85%	100-00%
1.1.17 YLDs due to injury by 5-year age group and sex (YLDs per 100 000 per population per year; GBD cause C)	GBD	2017	85%	100-00%
1.1.18 Mortality due to injury by 5-year age group and sex (deaths per 100 000 per population per year; GBD cause C)	GBD	2017	85%	100-00%
1.1.19 YLDs due to transport injury by 5-year age group and sex (YLDs per 100 000 per population per year); subset of injury (GBD cause C.1)	GBD	2017	85%	100-00%
1.1.20 Mortality due to transport injury by 5-year age group and sex (deaths per 100 000 per population per year); subset of injury (GBD cause C.1)	GBD	2017	85%	100-00%
1.1.21 YLDs due to interpersonal violence by 5-year age group and sex (YLDs per 100 000 per population per year); subset of injury (GBD cause C.3.2)	GBD	2017	85%	100-00%
1.1.22 Mortality due to interpersonal violence by 5-year age group and sex (deaths per 100 000 per population per year); subset of injury (GBD cause C.3.2)	GBD	2017	85%	100-00%
1.1.23 YLDs due to self-harm by 5-year age group and sex (YLDs per 100 000 per population per year); subset of injury (GBD cause C.3.1)	GBD	2017	85%	100-00%
1.1.24 Mortality due to self-harm by 5-year age group and sex (deaths per 100 000 per population per year); subset of injury (GBD cause C.3.1)	GBD	2017	85%	100-00%
<b>Child health</b>				
1.2.01 Infant mortality rate (probability of dying between birth and exactly 1 year of age, expressed per 1000 livebirths), by sex	UN IGME	2016	97-5%	100-00%
1.2.02 Number of deaths of children, under 5 years of age, per 1000 livebirths, by sex	UN IGME	2016	97-5%	100-00%
1.2.03 Proportion of children aged 12–23 months who have received all basic vaccinations (BCG, MCV1, DTP3, Polio3; %), by sex	DHS, UNICEF	2011–16	60%	71-77%
1.2.04 Proportion of children, aged 12–23 months, who have received BCG (%), by sex	DHS, UNICEF	2011–16	52-5%	71-45%
1.2.05 Proportion of children, aged 12–23 months, who have received MCV1 (%), by sex	DHS, UNICEF	2011–16	52-5%	71-45%
1.2.06 Proportion of children under 5 years of age with fever in the past 2 weeks for whom advice or treatment was sought from a health facility or provider (%), by sex	UNICEF	2010–16	35%	25-97%
<b>Food security and nutrition</b>				
1.3.01 Proportion of children under 5 years of age with stunting (height for age less than –2 SD below the median; %), by sex	UNICEF	2010–17	37-5%	19-84%
1.3.02 Prevalence of thinness among 5–19 year olds (BMI less than –2 SD below the median of reference population; %), by sex (mapped as 15–19 years)	WHO	2016	97-5%	100-00%
1.3.03 Prevalence of overweight among 5–19 year olds (BMI higher than 1 SD above the median; %), by sex (mapped as 15–19 years)	WHO	2016	97-5%	100-00%
1.3.04 Prevalence of anaemia (based on WHO age-specific and sex-specific haemoglobin thresholds; %), by 5-year age group and sex	GBD	2016	85%	100-00%

(Table continues on next page)

Definition	Data source*	Year	Country coverage	Population coverage†
(Continued from previous page)				
<b>Health behaviours</b>				
1.4.01 Proportion of 15–19 year olds who report an episode of binge drinking (>48 g females, >60 g males) in the past 12 months (%), by sex	GBD	2016	85%	100.00%
1.4.02 Prevalence of daily tobacco smoking among 10–19 year olds (%), by sex	GBD	2016	85%	100.00%
<b>Psychosocial wellbeing</b>				
1.5.01 Proportion of 13–17 year olds who report being so worried about something that they could not sleep at night most of the time or always in the past 12 months (%), by sex	WHO	2010–16	65%	30.25%
<b>Sexual and reproductive health and rights</b>				
1.6.01 Proportion of 15–19 year olds with comprehensive knowledge of HIV (%)	UNICEF	2010–16	75%	72.78%
1.6.02 Proportion of currently married or partnered females, aged 15–19 years, who can say no to their husband if they do not want to have sexual intercourse (%)	DHS	2016–17	15%	11.52%
1.6.03 Proportion of married or partnered females, aged 15–19 years, who are current users of family planning, who decide to use family planning themselves or jointly with their husband (%)	DHS	2016–17	7.5%	11.15%
1.6.04 Proportion of married or partnered females, aged 15–19 years, who make decisions about their own health care, themselves or jointly with their husband (%)	DHS	2012–17	42.5%	66.78%
1.6.05 Demand for contraceptives satisfied with a modern method in females aged 15–24 years (%)	GBD	2016	85%	100.00%
1.6.07 Number of livebirths per 1000 females aged 15–19 years	UNICEF	2014	100%	100.00%
1.6.08 Mortality rate due to maternal disorders among 15–19 year olds (deaths per 100 000)	GBD	2016	85%	100.00%
<b>Education and employment</b>				
<b>School participation</b>				
2.1.01 Pre-primary education: number of children enrolled in pre-primary school (regardless of age) as a proportion of all children of pre-primary school age (%), by sex	UNICEF	2016	87.5%	94.77%
2.1.02 Adjusted net attendance ratio: primary school (number of children attending primary or secondary school who are of official primary school age, divided by number of children of primary school age; %), by sex	UNICEF	2010–16	60%	54.39%
2.1.03 Completion rate: primary school (household survey data; %), by sex	UNESCO	2010–16	40%	60.38%
2.1.04 Proportion not in school: primary school (number of children of primary school age who are not enrolled in primary or secondary school, as a proportion of primary school-aged children; %), by sex	UNICEF	2010–16	7.5%	7.00%
2.1.05 Adjusted net attendance ratio: lower secondary school (number of children attending lower secondary or tertiary school who are of official lower secondary school age, divided by number of children of lower secondary school age; %), by sex	UNICEF	2010–16	42.5%	28.79%
2.1.06 Completion rate: lower secondary school (household survey data; %), by sex	UNESCO	2010–16	40%	60.38%
2.1.07 Proportion not in school: lower secondary school (number of children of lower secondary school age who are not enrolled in secondary school, as a proportion of lower secondary school-aged children; %), by sex	UNICEF	2010–13	7.5%	7.07%
2.1.08 Adjusted net attendance ratio: upper secondary school (number of children attending upper secondary or tertiary school who are of official upper secondary school age, divided by number of children of upper secondary school age; %), by sex	UNICEF	2010–16	42.5%	28.79%
2.1.09 Completion rate: upper secondary school (household survey data; %), by sex	UNESCO	2010–16	40%	60.38%
2.1.10 Proportion not in school: upper secondary (using household survey data; %), by sex	UNESCO	2012–16	62.5%	60.46%
<b>Learning outcomes</b>				
2.2.01 Proportion of 15–24 year olds who are literate (%), by sex	UNICEF	2010–16	72.5%	99.76%
<b>Access to information</b>				
2.3.01 Proportion of adolescents, aged 15–19 years, who own a mobile phone (%), by sex	DHS, ITU	2014–16	22.5%	22.53%
2.3.02 Proportion of adolescents, aged 15–19 years, who used the internet in the past 12 months (%), by sex	DHS, MICS	2010–17	25%	13.94%
2.3.03 Proportion of adolescents, aged 15–19 years, with access to information media (newspaper, TV, or radio) at least once a week (%), by sex	DHS	2012–17	42.5%	73.56%
<b>Transition to employment</b>				
2.4.01 Proportion of youth aged 15–24 years not in education, employment, or training (%), by sex	ILO	2010–16	47.5%	69.46%
2.4.02 Proportion of youth, aged 15–24 years, currently unemployed as a percentage of the total number of employed and unemployed people (the labour force; %), by sex	ILO, NMDI	2010–17	72.5%	71.49%
<b>Protection</b>				
<b>Sex preference</b>				
3.1.01 Sex ratio at birth (number of male births per one female birth)	UNDP	2015	82.5%	100.00%
3.1.02 Expected-to-estimated female infant mortality rate ratio (ratio less than 1 suggests excess female infant mortality)	UN IGME	2016	97.5%	100.00%
3.1.03 Expected-to-estimated mortality rate for females under 5 years of age	UN IGME	2016	97.5%	100.00%

(Table continues on next page)

Definition	Data source*	Year	Country coverage	Population coverage†
(Continued from previous page)				
<b>Legal, financial, and social protection</b>				
3.2.01 Proportion of children under 5 years of age whose birth has been registered with a civil authority (%), by sex	UNICEF	2010–16	52.5%	60.48%
3.2.02 Proportion of children, aged 0–59 months, left alone or in the care of another child younger than 10 years of age for more than 1 h at least once in the past week (%), by sex	UNICEF	2010–16	30%	12.58%
3.2.03 Proportion of children aged 0–17 years who live with neither biological parent (%), by sex (mapped as 5–9 years)	UNICEF	2010–16	52.5%	60.48%
3.2.04 Child marriage: proportion of 20–24 year olds who were married before 15 years of age (%), by sex	DHS, UNICEF	2010–16	57.5%	71.14%
3.2.05 Child marriage: proportion of 20–24 year olds who were married by 18 years of age (%), by sex	DHS, UNICEF	2010–16	60%	76.46%
3.2.06 Proportion of youth, aged 15–24 years, who have their own bank account (%), by sex	DHS	2016–17	10%	7.83%
3.2.07 Proportion of married or partnered females, aged 15–19 years, in paid work, who make decisions about how earnings are used, themselves or jointly with their husband (%)	DHS	2012–17	22.5%	66.18%
3.2.08 Proportion of married or partnered females, aged 15–19 years, who make decisions about major household purchases, themselves or jointly with their husband (%)	DHS	2012–17	42.5%	66.78%
<b>Violence and harmful practices</b>				
3.3.01 Proportion of children, aged 1–14 years, who experience violent discipline (psychological aggression or physical punishment) from a caregiver (%), by sex (mapped to 5–9 years)	UNICEF	2016	35%	14.54%
3.3.02 Proportion of 13–17 year olds who report experiencing bullying in the past 30 days (%), by sex	GSHS	2010–16	65%	25.17%
3.3.03 Proportion of ever-partnered females, aged 15–19 years, who have experienced intimate partner violence in the past 12 months, physical or sexual (%)	DHS	2012–16	27.5%	54.33%
3.3.04 Proportion of females, aged 20–24 years, who experienced forced sex by 18 years of age (%)	DHS	2013–17	25%	54.15%
3.3.05 Proportion of adolescents, aged 15–19 years, who think that a husband or partner is justified in hitting or beating his wife or partner under certain circumstances, by sex	UNICEF	2010–16	57.5%	71.30%
<b>Exploitation</b>				
3.4.01 Average number of hours that children, aged 5–14 years, spend doing household chores per week, by sex (mapped to 10–14 years)	UNICEF	2010–16	22.5%	5.93%
3.4.02 Proportion of children, aged 5–17 years, engaged in child labour (%), by sex (mapped to 10–14 years)	UNICEF	2010–16	37.5%	16.37%
3.4.03 Proportion of children, aged 5–17 years, engaged in child labour who are in hazardous work (%), by sex (mapped to 10–14 years)	ILO	2011–16	17.5%	12.48%
3.4.04 Number of detected trafficked children under 18 years of age, by sex (mapped against 15–19 years)	UNODC	2014	15%	13.37%
<b>Safe environment</b>				
<b>Air pollution</b>				
4.1.01 DALYs due to household air pollution (DALYS per 100 000), by 5-year age group and sex	GBD	2016	85%	100.00%
<b>Water, sanitation, and hygiene</b>				
4.2.01 DALYs due to unsafe water, sanitation, and hygiene (DALYs per 100 000), by 5-year age group and sex	GBD	2016	85%	100.00%
4.2.02 Proportion of households where a person under 15 years of age is usually responsible for water collection (%), by sex (mapped against 10–14 years)	DHS, MICS	2010–12	15%	4.41%
<b>Mobility</b>				
4.3.01 Proportion of married or partnered females, aged 15–19 years, who make decisions about visiting family or friends, themselves or jointly with their husband (%)	DHS	2012–16	40%	27.70%
4.3.02 Number of international migrants younger than 20 years of age (thousands), by sex (mapped against 15–19 years)	UN DESA	2017	100%	100.00%
<b>Conflict and disaster</b>				
4.4.01 Number of refugees, asylum seekers, internally displaced, stateless, or other people of concern younger than 18 years of age (thousands), by sex (mapped against 15–19 years)	UNHCR	2010–16	62.5%	97.00%

This table shows specific indicators and data sources for each domain and sub-domain of the measurement framework. Data coverage is shown as both as the proportion of countries and the proportion of young people for which data were available. YLD=year lived with disability. GBD=Global Burden of Diseases, Injuries, and Risk Factors Study. CMNN=communicable, maternal, neonatal, and nutritional. STI=sexually transmitted infection. NCD=non-communicable disease. IGME=Inter-agency Group for Child Mortality Estimation. DHS=Demographic and Health Survey. UNESCO=UN Educational, Scientific and Cultural Organisation. ITU=International Telecommunication Union. MICS=Multiple Indicator Cluster Survey. ILO=International Labour Organization. NMDI=National Minimum Development Indicators. GSHS=Global School-based Student Health Survey. DESA=Department of Economic and Social Affairs. UNHCR=UN Refugee Agency. DALY=disability-adjusted life-year. \*For indicators drawn from GBD (1.1.01–1.1.24), we include the GBD cause code. †Population coverage for indicators sourced from GBD is 100% despite 85% country coverage because of the very small population of the six Pacific countries not included in GBD.

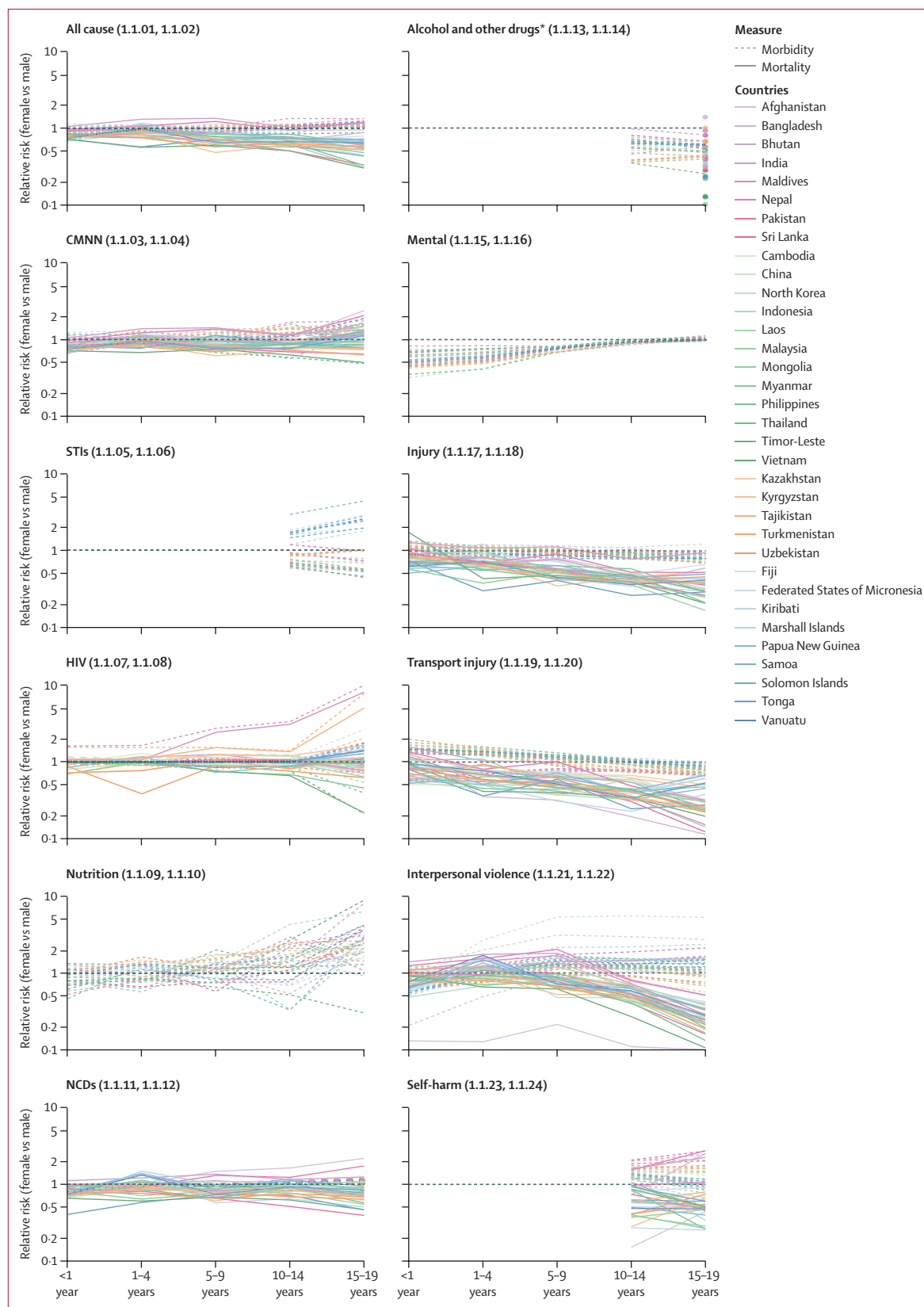
**Table: Indicator definitions, data sources, and data availability by domain and subdomain**

For the GBD cause hierarchy see <http://ghdx.healthdata.org/record/ihme-data/gbd-2017-cause-rei-and-location-hierarchies>

study design through inputs on indicators and data and interpretation of findings. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

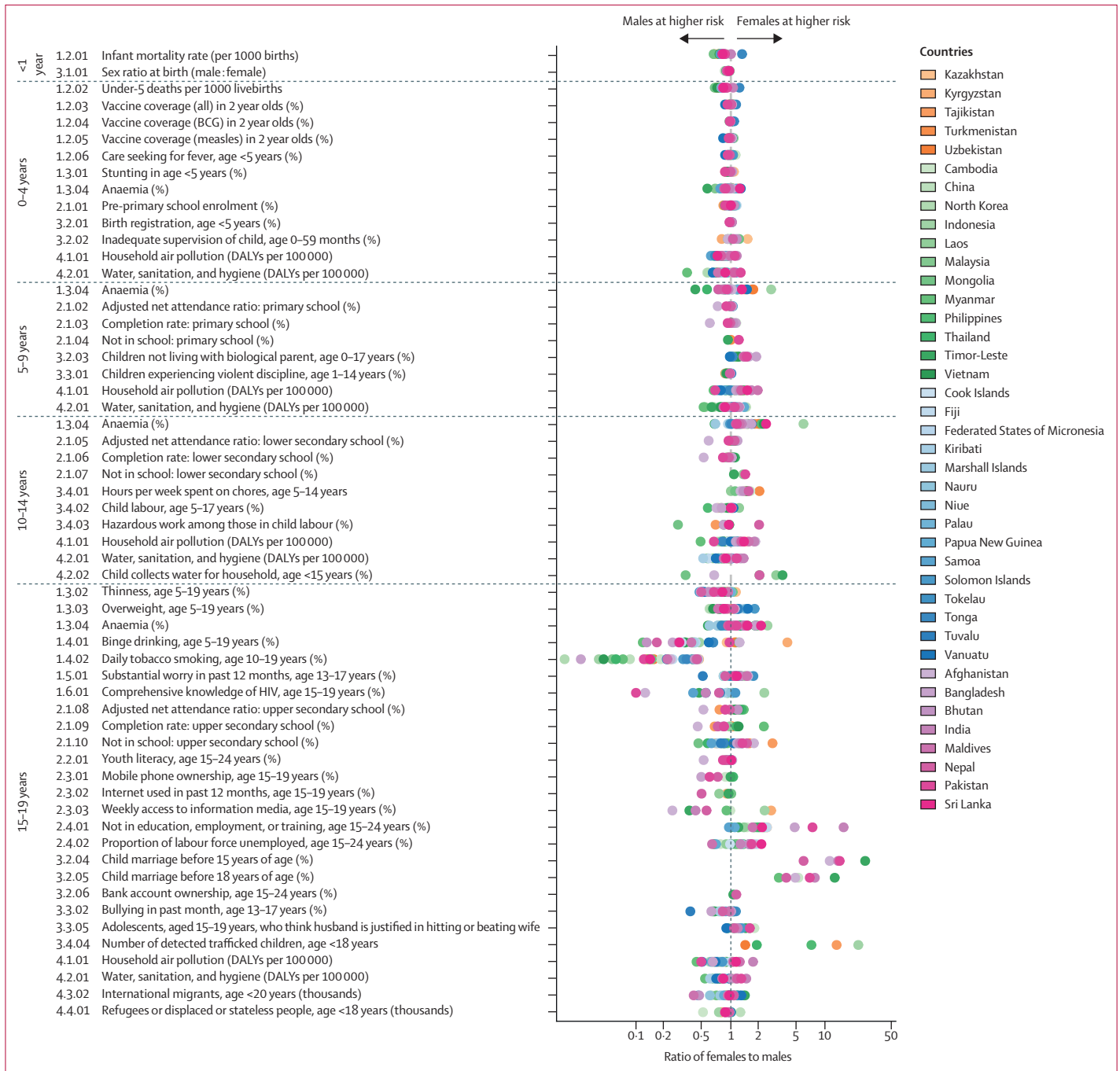
## Results Overview

The final framework included 87 indicators across four domains of wellbeing: 44 related to health, 16 to education



**Figure 2: Relative risks by gender for mortality and morbidity across the first two decades**

This figure shows relative risks (shown on a log scale) for indicators of morbidity and mortality across the first two decades of life as available, with a relative risk greater than 1 indicating the outcome is more likely in females. Outcomes related to STIs, alcohol and other drugs, and self-harm are only reported for adolescents given these outcomes are uncommon before 10 years of age. Mortality estimates for STIs, nutritional disorders, and mental disorders were excluded given low rates overall (<1% total mortality). Data are from GBD 2017. CMNN=communicable, maternal, neonatal, and nutritional. GBD=Global Burden of Diseases, Injuries, and Risk Factors Study. STI=sexually transmitted infection. \*Mortality point estimates are shown for age group 15-19 years, as no mortality data are available for earlier years.

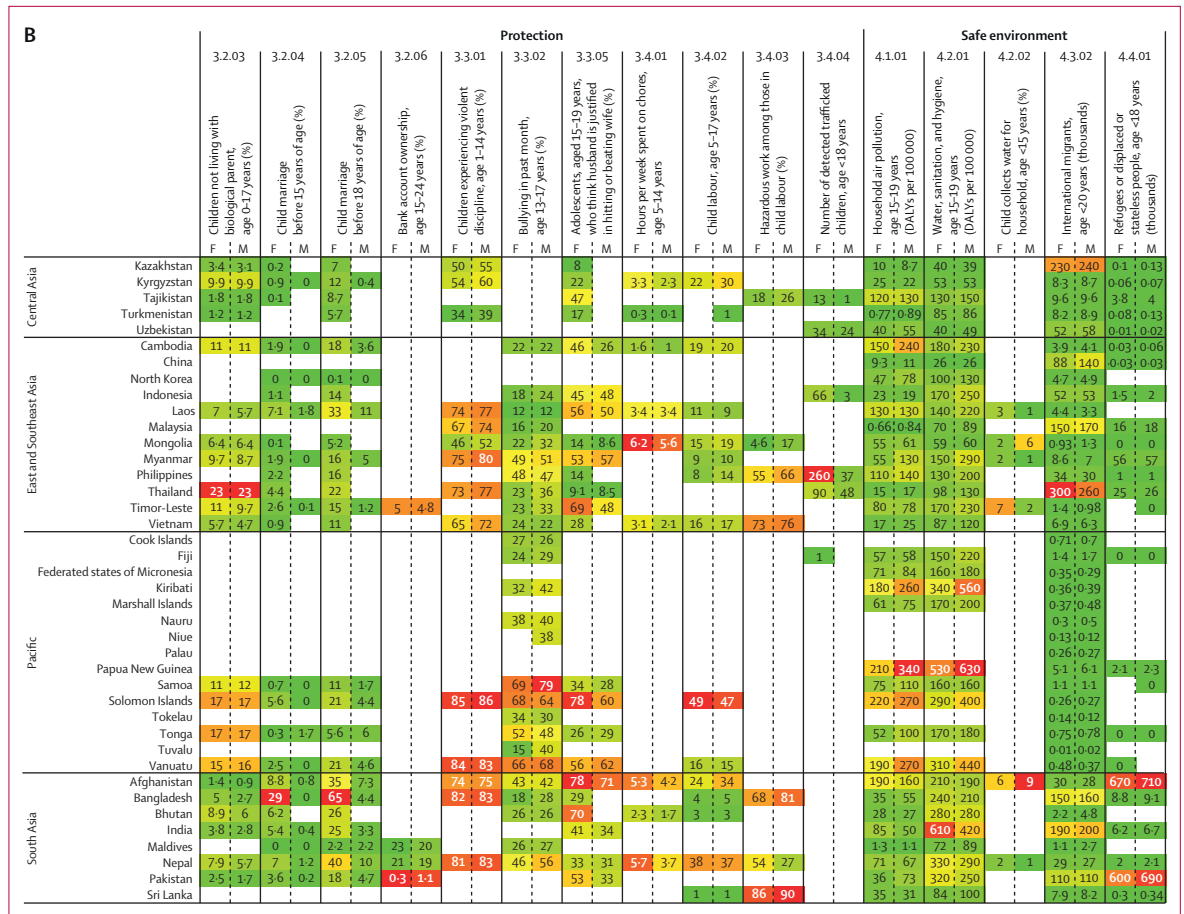


**Figure 3: Relative risks by gender for age-specific indicators across the first two decades of life**  
 Relative risks for indicators of health and wellbeing are shown, organised by key life stages. Estimates are coloured by region and country and shown on a log scale, with points to the right signifying that females are at higher risk than males. Indicator definitions and data sources are detailed in the table; the first digit of the indicator number refers to the domain (1: health, 2: education, 3: protection, 4: environment).

and transition to employment, 21 to protection, and six to safe environment (table). 27 indicators were available across childhood and adolescence, 18 indicators were specific to children (<10 years), and 42 were specific to adolescents. Data were available for 70% of children and adolescents across all indicators, with data most scarce (<10% population

coverage) for indicators relating to childhood labour and exploitation (indicators 4.2.02 and 3.4.01), educational participation (indicators 2.1.04 and 2.1.07), and financial protection (indicator 3.2.06). Data coverage was overall poorest in the Pacific region. Here, we describe key findings for each of the four domains, with





**Figure 4: Country-level estimates, by gender, for indicators of health and wellbeing during adolescence**  
 Country level estimates for indicators of health and wellbeing for adolescents are shown, for the age group where gender inequalities are most marked (see figures 2 and 3). Estimates are shown as a heatmap, with countries shaded on a scale from green (best value observed for each indicator) to red (worst value observed) across both genders; white spaces mean data are not available. Indicator definitions and data sources are detailed in the table. B=both genders. F=females. M=males.

country-level estimates for each indicator provided in the appendix.

**Health outcomes and risks**

Estimates of mortality by sex were available across the first two decades of life for 34 countries (figure 2). Boys experienced excess all-cause mortality compared with girls during the first year of life in all countries except India. Overall, the excess risk of mortality for males increased across childhood and adolescence, with the greatest differences among 15–19 year olds; Pakistan and India were notable exceptions, with girls being at excess risk of mortality compared with boys across childhood, and also late adolescence in India (appendix p 15). In all countries, injuries were an important driver of gender differences in all-cause mortality. These gender differences were most marked for adolescents aged 15–19 years, where boys were at excess risk of transport injuries and interpersonal violence compared with girls. Mortality due to self-harm was higher for boys for the majority of countries in East and Southeast Asia, Central

Asia, and the Pacific, with the rate of suicide in boys aged 15–19 years at least three times that of girls in Kiribati, Thailand, Myanmar, and Malaysia. By contrast, girls aged 15–19 years in Bangladesh, India, and Pakistan had suicide rates more than twice that of boys (appendix pp 11, 15, 21). Gender differences in HIV mortality rates were substantial and highly variable by region. Girls aged 15–19 years had a HIV mortality rate three times that of boys in Tajikistan and more than five times that of boys in the Maldives, whereas in Vietnam the HIV mortality rate was five times higher for boys than for girls (appendix pp 17, 47, 53).

Gender disparities in all-cause morbidity (measured as years lived with disability) were less marked (figure 2), but there were some substantial disparities by cause. The largest disparities were for nutritional morbidities: girls aged 15–19 years were at excess risk of nutritional disease compared with boys in almost all countries. Gender differences in STI morbidity also emerged during adolescence, with morbidity among girls aged 15–19 years in the Pacific more than twice that of boys. In all countries,

		Health					Protection					Safe environment	
		1.6.07	1.6.05	1.6.08	1.6.03	1.6.04	3.1.02	3.1.03	3.3.03	3.3.04	3.2.07	3.2.08	4.3.01
		Livebirths per 1000 females aged 15–19 years (measured)	Demand for modern contraception satisfied, age 15–24 years (%)	Maternal mortality rate per 100 000 females aged 15–19 years	Married family planning users who make decisions about contraception, age 15–19 years (%)	Married females who make decisions on own health care, age 15–19 years (%)	Expected-to-estimated female infant mortality rate ratio	Expected-to-estimated female under-5 mortality rate ratio	Physical or sexual intimate partner violence in past 12 months, age 15–19 years (%)	Females aged 20–24 years who experienced forced sex before age 18 years (%)	Married females in paid work who can decide spending, age 15–19 years (%)	Married females who can decide household purchases, age 15–19 years (%)	Married females who make decisions about visiting family or friends, age 15–19 years (%)
Central Asia	Kazakhstan	31	72	0.42			1.1	1.1					
	Kyrgyzstan	42	47	1.3		70	1	1	2.7			55	58
	Tajikistan	47	28	1.1		14	1	1	5.6			9.8	14
	Turkmenistan	21	43	0.25			1.2	1.2					
	Uzbekistan	26	68	0.5			1.1	1.1					
East and Southeast Asia	Cambodia	57	55	1.9		89	1	1	7	1.7	97	87	95
	China	6.2	85	0.22			0.93	0.93					
	North Korea	0.7	67	3.8			1	1					
	Indonesia	47	83	6.8		76	1	1			91	80	81
	Laos	94	57	11			1	1					
	Malaysia	13	75	0.63			0.99	0.98					
	Mongolia	40	65	1.7			1.2	1.2					
	Myanmar	17	79	6		70	1	1	22	1.3	77	54	81
	Philippines	59	44	2.9	89	95	1	1	11	2	97	83	92
	Thailand	60	85	0.46			1.1	1					
	Timor-Leste	54	39	10		91	0.98	0.98	38	3.3		82	88
Vietnam	36	67	0.47			1	1.1						
Pacific	Cook Islands	56					1	1					
	Fiji	28	79	2.3			0.94	0.94					
	Federated states of Micronesia	33	69	2.7			1	1					
	Kiribati	49	53	4.3			1	1					
	Marshall Islands	85	66	3.7			1	1					
	Nauru	110					1	1					
	Niue	16					1	1					
	Palau	27					1	1					
	Papua New Guinea	65	45	19			0.99	1					
	Samoa	39	55	1.7		86	0.96	0.96				68	82
	Solomon Islands	62	52	5.7		83	0.97	0.97				76	72
Tokelau	30												
Tonga	30	67	5.2		80	0.59	0.64				80	68	
Tuvalu	42					1	0.98						
Vanuatu	78	61	5.2		73	0.96	0.96				64	76	
South Asia	Afghanistan	90	27	22		41	0.96	0.97	29	1.3	81	33	42
	Bangladesh	83	74	5.5		49	0.95	0.94			78	41	44
	Bhutan	28	55	6.9			0.99	0.99					
	India	38	53	7.6		61	0.81	0.78	18	1.1	66	55	
	Maldives	14	72	1.2		81	1	1	3.5	0.4		84	96
	Nepal	87	38	10	82	27	0.94	0.92	17	3.1	75	14	19
	Pakistan	48	34	16	91	24	0.97	0.94	24	1.8	81	16	19
	Sri Lanka	24	75	1.3			1	0.99					

**Figure 5: Country-level estimates for indicators of health and wellbeing specific to females**  
 Estimates are shown as a heatmap, with countries shaded on a scale from green (best value observed for each indicator) to red (worst value observed); white spaces mean data are not available. Indicator definitions and data sources are detailed in the table.

girls aged 10–14 years experienced higher rates of morbidity due to self-harm, most markedly in South Asian and Central Asian countries, where rates were also higher for girls aged 15–19 years. For morbidity related to interpersonal violence (which includes assault and sexual violence), the greatest disparities were evident during adolescence: girls aged 15–19 years had higher rates than boys in the majority of countries, and more than double that of boys in Kiribati (RR 2.4), North Korea (2.7), and China (5.3). Adolescent boys had greater risk of morbidity relating to alcohol and other drugs in all countries.

Age-specific health indicators revealed a similar pattern of gender disparity across the first two decades (figure 3; appendix p 77). As biologically expected, boys had higher infant and under-5 mortality rates in all countries, with the exception of Tonga and India. Estimates for Tonga might reflect quality of data and underlying mortality distributions (uncertainty estimates for comparable indicators of mortality are shown in appendix p 72); however, data for India are more robust and are likely to reflect male preference.<sup>25</sup>

There were few gender differences for other health outcomes and risks during childhood. In particular, rates of vaccination, stunting, and care-seeking were similar for boys and girls in all countries. Disparities became most prominent during late adolescence. For adolescent boys, the prevalence of health risk behaviours was substantially greater than that of girls in most countries. This was particularly so for daily tobacco smoking, with boys aged 10–19 years twice as likely as girls to report smoking on average and four times so in east Asian countries. Rates of binge drinking were also greater for boys in most countries; however, this was not the case in Mongolia and Afghanistan, and in Central Asian countries where rates of binge drinking were high overall for both genders (figure 4A). Of note, substantial gender inequalities in these health risks and injuries occurred in countries where broader measures of societal gender inequality (SIGI, GII) and development (HDI) were otherwise favourable (figure 4).

Gender disparities in other health indicators were less marked. The prevalence of thinness was low (≤15%) in all

regions except South Asia (figure 4). In this region, prevalence of thinness was higher among boys, and more than double for boys in Nepal and Afghanistan. Girls aged 15–19 years in all Pacific countries had a higher prevalence of overweight, with the prevalence of overweight exceeding 50% for girls in ten of 14 Pacific countries with available data. Adolescent girls had considerably lower comprehensive HIV knowledge in 13 of 18 countries with data available for girls and boys; knowledge was eight times higher among boys than girls in Afghanistan and ten times higher in Pakistan, although overall knowledge in each of these countries was very low.

Poor outcomes and risks around sexual and reproductive health and rights were prevalent among girls, particularly in Pacific and South Asian countries (figure 5). Very high rates of adolescent fertility were found in Nauru, Laos, Afghanistan, Nepal, Marshall Islands, Bangladesh, Vanuatu, and Papua New Guinea. Countries with higher adolescent fertility also had higher rates of adolescent maternal mortality, with the highest rates reported in Afghanistan, Papua New Guinea, and Pakistan. Most countries with high fertility rates also had considerable unsatisfied demand for contraception: less than half of married girls aged 15–24 years had their demand for modern contraception satisfied in Afghanistan, Tajikistan, Pakistan, Nepal, Timor-Leste, Turkmenistan, the Philippines, Papua New Guinea, and Kyrgyzstan. Married adolescent girls' autonomy in decision making about their own health care was low in many countries, particularly in South Asia.

#### Education and transition to employment

With regard to education, there was little gender disparity in pre-primary, primary, and lower secondary education participation and completion (figure 3), with the exception of Pakistan, Laos, and Afghanistan, with the proportion of girls not in lower secondary school 1.4 times higher than for boys in Pakistan and Laos and 2.2 times higher in Afghanistan. Gender disparities became more prominent during late adolescence; however, the pattern was mixed. Rates of upper secondary school attendance and completion were higher among boys in 12 (48%) of 25 and nine (56%) of 16 countries with available data, respectively (figure 4A). Completion of upper secondary school was less than 50% for both genders in nine countries, particularly those in South Asia, and was less than 6% in Myanmar (figure 4A). In Cambodia, Myanmar, Nauru, Tokelau, Tonga, and Tuvalu, the majority of both boys and girls were not in upper secondary education, and the majority of girls were not in upper secondary education in Afghanistan, Bangladesh, and Pakistan. Literacy among 15–24 year olds was similar for boys and girls in most countries, with the exception of Afghanistan, where the literacy rate for boys was nearly double that of girls (figure 3; figure 4A).

The proportion of girls aged 15–24 years not in education, employment, or training (NEET) was higher than for boys in 17 of 19 countries for which data were available (figure 3). Rates of NEET among girls were more than double those of boys in Thailand, Myanmar, Kyrgyzstan, Fiji, Sri Lanka, Bangladesh, and Pakistan, and more than 15 times higher in India (figure 4A). Rates of NEET among girls were highest in Pacific and South Asian countries, most notably India and Pakistan where 54% of girls were NEET (figure 4A).

In most countries with data on access to information technologies, girls aged 15–19 years were less likely to have used the internet in the past 12 months, and had lower mobile phone ownership (figure 3; figure 4A). The greatest disparities were in South Asian countries: rates of internet use among boys were double those of girls in Nepal and quadruple those of girls in Pakistan, and mobile phone ownership was 1.4–3.9 times higher among boys in Nepal, Pakistan, and Bangladesh. Weekly access to information media was also substantially lower among adolescent girls in Nepal, India, Afghanistan and Timor-Leste, but substantially higher in Kyrgyzstan and Indonesia.

#### Protection

We found that the sex ratio of males to females at birth in India, Vietnam, and China was greater than 1.10 (compared with an expected ratio of 1.05; appendix p 86). In China, Fiji, Bangladesh, Nepal, and Pakistan, infant and child mortality rates among girls were higher than expected, and substantially so in India and Tonga (figure 5). Other indicators of protection during childhood showed little gender disparity: girls and boys had similar rates of birth registration, adequate supervision, and violent discipline (figure 3).

Gendered disparities were more prominent during early adolescence. Girls aged 5–14 years spent more time on household chores than boys in eight of nine countries with data (figure 4B). There was substantial inequality in child marriage. In 14 of the 16 countries where male comparator data were available, the prevalence of marriage among girls by age 15 years and age 18 years was more than triple that of boys, Tonga and the Maldives being the exceptions (figure 3). The proportion of girls married by age 18 years was highest in South Asian countries, and more than 25% in Afghanistan, Bangladesh, Bhutan, India, Nepal, and Laos (figure 4B). Consistent with high rates of child marriage, girls aged 0–17 years in South Asia were between 1.4 and 1.9 times less likely to be living with a biological parent compared with boys (figure 4B). Married girls in South Asia and Tajikistan had low rates of financial protection, with little autonomy in decision making about household spending and spending their own earnings (figure 5). High prevalence of physical or sexual intimate partner violence in the past 12 months among ever-partnered girls aged 15–19 years was evident, particularly in South Asian countries such as Afghanistan,

Pakistan, India, and Nepal, although highest in Timor-Leste (figure 5). In all five countries with available data for females and males, the number of trafficked girls younger than 18 years was substantially higher than boys, most notably in Tajikistan (13 times) and Indonesia (22 times; figure 4B); the precision of these estimates was not available.

Being a victim of bullying in the past month was more common among boys aged 13–17 years in 15 (60%) of 25 countries, with little difference between genders in other countries (figure 3, 4B). Child labour was more common among boys in eight (57%) of 14 countries, with the highest gender disparity in Philippines (1.8 times higher among boys), and the highest prevalence of child labour among boys ( $\geq 20\%$ ) in Kyrgyzstan, Cambodia, Samoa, Afghanistan, and Nepal (figure 4B). Of those in child labour, boys had a higher prevalence of hazardous work in all countries with data, except Nepal. In the Philippines, Vietnam, Bangladesh, and Sri Lanka, the majority of all child labour was hazardous work.

### Safe environment

Available indicators and data related to safe environment were scarce. Disability-adjusted life-years attributable to water and sanitation, and air pollution were reported as proxy indicators for this domain across childhood and adolescence. Girls living in South Asia appeared to be at excess risk from these environmental exposures, whereas in east Asia, boys were at greater risk than girls (figure 3). However, these modelled estimates varied little by age. The proportion of households where girls collected water were more than double those for boys in Nepal, Myanmar, Laos, and Timor-Leste (figure 3, 4B). The proportion of households where boys collected water was 1.5 times higher in Afghanistan and three times higher in Mongolia.

With the exception of China, the Philippines, and Mongolia, there were higher numbers of male refugees or displaced or stateless people younger than 18 years compared with females, most notably in Kazakhstan, Indonesia, and Cambodia where the number of boy refugees was 1.3–2.0 times higher than girls. Boys were also more likely to be international migrants in 26 (65%) of 40 countries, with the number of boy migrants younger than 18 years double that of girls in Bhutan, Tuvalu, and the Maldives (figure 4B). In Central Asia and South Asia, married adolescent girls had little autonomy in terms of mobility: less than half of married girls aged 15–19 years in Pakistan, Nepal, Bangladesh, Afghanistan, and Tajikistan made their own decisions about visiting family or friends (figure 5).

### Discussion

Son preference remains evident in some settings, signified by higher than expected male-to-female sex ratios at birth in India, Vietnam, and China (which might indicate prenatal sex determination and sex-selective abortion), and a higher than expected mortality among

female children in some South Asian and Pacific nations. Gender inequalities in other indicators of wellbeing across early childhood were otherwise not observed; gains made in child mortality, undernutrition, and primary education have been, for the most part, equally shared by boys and girls in this region. Progress, however, has not continued through the second decade of life, with gender inequalities in wellbeing emerging most markedly and increasing during adolescence.

Adolescent girls continue to face considerable disadvantage in relation to sexual and reproductive health and rights, including protection from child marriage and intimate partner violence. Despite near universal commitments to end child marriage, a substantial proportion of girls in the Asia-Pacific region were married by age 18 years, and rates of adolescent childbearing remain high in many countries. Girls have poor access to modern contraception and experienced high rates of intimate partner and sexual violence. Discrimination and disadvantage affecting girls was most notable in South Asia, reflected in the highest rates of child marriage, adolescent births, intimate partner violence, and suicide mortality, and lower education participation and completion. Despite having achieved educational parity in many countries, girls are not transitioning to further training or employment at the same rate as boys. Unpaid domestic work, early parenthood, and care-giving responsibilities are likely to be important contributors to girls' unemployment, suggesting that despite improved education participation, girls commonly remain in traditional gender roles following school completion and experience profound gendered barriers to participation in paid employment.<sup>26</sup>

Adolescent boys have greater all-cause mortality and substantially higher mortality due to unintentional injury, interpersonal violence, and alcohol and other drugs, and higher prevalence of harmful drinking and tobacco smoking. In all but some South Asian countries (Bangladesh, India, and Pakistan), boys also had substantially higher rates of suicide mortality than their female counterparts. Although rates of upper secondary school participation and completion were similar for boys and girls in most countries, boys were more likely to be out of school in several East and Southeast Asian and Pacific countries, and were more likely to be engaged in child labour and hazardous work.

Puberty is transformative in the health and development trajectories of girls and boys. While physical, hormonal, and neurodevelopmental pubertal processes contribute to biological sex differences in some health outcomes and risks, puberty is also characterised by an intensification of gender socialisation, during which gender identity, roles, and norms sharply diverge and take on increasing prominence.<sup>27</sup> These norms are consolidated during adolescence and profoundly shape the lives of adolescents, with consequences for health that extend into adulthood and for the next generation.<sup>11</sup> Gender norms vary across

sociocultural contexts; however, common gender stereotypes underpin disadvantage for both girls and boys across the Asia-Pacific region. Underlying patriarchal systems that reinforce gender norms assigning higher status and power to boys over girls, and reward hegemonic (dominant) constructs of masculinity, contribute to boys' risk taking, use of and exposure to violence, and poor care seeking. These same systems police restrictive feminine norms that limit girls' opportunities and agency, and increase vulnerability to harmful practices (such as child marriage), intimate partner violence, and poor sexual and reproductive health.<sup>3,28</sup> Non-conformity with rigid norms can lead to sanctions and punishment, which also have negative health and wellbeing outcomes.<sup>3</sup>

These findings substantially extend our understanding of gender inequality during childhood and adolescence. They challenge the narrow focus on women in existing gender indicators, policies, and programmes, and draw attention to the need to prioritise adolescents, an age group where few investments have been made to date. This analysis also highlights the substantial regional and national variation in the impacts of gender inequality, emphasising the need for context-specific programming and policy. Such a response will require investments across many sectors. Action is required to prevent child marriage and adolescent pregnancy; remove policy, financial, and regulatory barriers limiting adolescents' access to sexuality education and sexual and reproductive health services; and reform workplaces to address gendered barriers that limit opportunities for girls to enter and remain in employment.<sup>3</sup> Greater attention is also needed to understand and address harmful norms and constructs of masculinity, as these not only contribute to adverse health outcomes and risks for boys into adulthood, but also have profound impacts on girls' health and wellbeing.<sup>29</sup> By early adolescence, girls and boys have attitudes that support gender inequality, and these norms are strongly influenced, and enforced, by family, peers, and societal structures.<sup>27</sup> They are therefore amenable to intervention, with some evidence that gender-transformative approaches combining strategies at the individual, social, and structural level might promote equitable gender attitudes and related behaviours during adolescence.<sup>30</sup>

Measuring and monitoring gender inequality during these key formative years is crucial. Of the 54 gender-sensitive SDG indicators (defined by UN Women),<sup>2</sup> only 13 relate specifically to childhood and adolescence and are focused largely on education, harmful practices affecting girls (child marriage, female genital mutilation), intimate partner and sexual violence, and child labour. A further 16 indicators related to poverty, employment, harassment, trafficking, homicide, and conflict call for disaggregation by sex and age. However, the extent to which these will be reported by both age and sex to allow for gender inequalities in this age group to be identified is unclear. Some key gender differences identified by this analysis (ie, suicide, injury, child mortality, alcohol use, and

tobacco smoking) are not currently tracked as gender-sensitive indicators, nor do these SDG indicators explicitly require disaggregation by sex or age. Additionally, current summary measures of societal gender inequality, such as the GII and SIGI, primarily reflect disadvantage and discrimination against adult women. A small number of studies have shown that increasing societal gender inequality is associated with poor child health outcomes.<sup>31-33</sup> Although this analysis did not specifically explore the relationship between these indices and gender inequalities in first two decades of life, there was a suggestion that existing gender indices correspond to inequalities in sexual and reproductive health and rights and some indicators of education, but less so to health risk behaviour or injury that predominantly affect males. An index of gender inequality that is specific to children and adolescents represents an important research agenda.

This study has some limitations. We used modelled data to populate some indicators relating to health to improve data coverage, consistent with analyses in the *Lancet* Series;<sup>34,35</sup> however, wide uncertainty estimates for some indicators suggest poor-quality primary data and a heavy reliance on modelling, which might affect our estimated gender inequalities. Nonetheless, it is reassuring that the findings of figure 2 (based on modelled data) are consistent with figure 3 (based largely on primary data). Even with the inclusion of modelled data, some potentially relevant aspects of health and wellbeing were not able to be examined due to the lack of internationally agreed and defined indicators, or lack of data disaggregated by age and sex. These include individual-level measures of poverty, food security, menstrual health, conflict, freedom of movement and share of public spaces, harassment and discrimination, and feeling of safety. There were also fewer indicators available for children than adolescents, and fewer indicators for the domains of protection and safe environment than those of health and education. These gaps, and the limitations of quantitative data to describe gender inequality and its effects, have also been noted by other authors.<sup>23</sup> The reporting of national data did not allow for important gender inequalities at a subnational level to be identified, or for analysis of intersecting inequalities related to ethnicity, poverty, disability, migrant status, or sexual orientation. Additionally, because of the lack of indicators and national-level comparable data, estimates for individuals with non-cisgender or non-binary identity could not be included, despite the substantial discrimination experienced by young people with diverse gender identity.<sup>3</sup>

This analysis has identified some important gender inequalities and trends emerging in the first two decades of life and further research is required to examine the drivers of gender inequality and gender socialisation, and the sociocultural context of gender norms and impacts in this diverse region. In the immediate term, the alignment of the reporting framework to UNICEF's strategic plan

helps to inform gender-responsive programming for children and adolescents. Although the developed framework was specific to the Asia-Pacific region, the heterogeneity of this region in terms of development and societal gender inequality (appendix p 3), coupled with this region being home to more than half of the world's young people, underscores its global relevance.

The SDGs have brought attention to gender equality as a global human right and health and development priority. The current focus on girls' sexual and reproductive health and elimination of harmful practices is well justified, as data from the Asia-Pacific region show that much remains to be achieved. However, there is a need to broaden the measurement and response to gender inequality arising during the first two decades of life, with much greater attention to adolescence as well as the effects of harmful gender norms on boys. The indicators included in this analysis are harmonised with available data collection efforts and might therefore serve as a foundation to this task. Action is clearly required to address the gender norms and structural determinants that not only drive poor sexual and reproductive health for girls, but also contribute to girls' poor outcomes across other domains of health and wellbeing, and underpin the excess mortality and health risks experienced by adolescent boys. Gender inequality remains one of the most pervasive challenges in global health and development. Early adolescence, when gender socialisation intensifies and key gender inequalities emerge, presents a crucial opportunity to address harmful gender norms before they are crystallised, and to advance gender equality for all.

#### Contributors

EK, GB, KH-W, and PA conceptualised and led this study. EK, PA, TT, KF, and KC contributed to data extraction and analysis. All authors contributed to data interpretation and drafting the manuscript. All authors approved the final manuscript and were responsible for the decision to submit for publication.

#### Declaration of interests

We declare no competing interests.

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