Annex

Table A.1 Data sources and variables in costing exercise

Data source	Countries	Indicators	
Demographic Health Surveys (DHS)	Egypt (2014),a Jordan (2002, 2017/2018), Mauritania (2019–2021), Morocco (2003/2004), Yemen (2013)	Marriage	Age at first marriage, percentage of women in union
		Age at first birth	Mean age at first birth
		Fertility level	Total fertility rate, age-specific fertility rate, age and birth order, birth interval
		Contraception use	Contraceptive prevalence rate, method mix and source mix, percentage of sterility, unmet needs, method attributes (average age of acceptance of permanent method, average duration of use of long-term and short-term method which are non-permanent in nature)
		Maternal health care/Morbidity	Percentage of births with high risk, miscarriage rate, maternal mortality ratio
			Pregnancies wanted later, unwanted pregnancies, postpartum insusceptibility, unintended pregnancies terminated/ induced abortions
		Child health	Infant mortality rate, under-5 mortality rate
Multiple Indicator Cluster Surveys (MICS)	Algeria (2018/2019), Iraq (2018), State of Palestine (2018/2019), Qatar (2012), Somalia (2006), the Sudan (2014), Syrian Arab Republic (2006), Tunisia (2018)	Marriage	Age at first marriage, percentage of women in union
		Age at first birth	Mean age at first birth
		Fertility level	Total fertility rate, age-specific fertility rate, age and birth order, birth interval
		Contraception use	Contraceptive prevalence rate, method mix and source mix, sterility, unmet needs, method attributes (average age of acceptance of permanent method, average duration of use of long-term and short-term method which are non-permanent in nature)
		Maternal health care/Morbidity	Percentage of births with high risk, miscarriage rate, maternal mortality ratio
			Pregnancies wanted later, unwanted pregnancies, postpartum insusceptibility, unintended pregnancies terminated/ induced abortion
		Child health	Infant mortality rate, under-5 mortality rate

Census of the Arab countries	Algeria (2018), Egypt (2006), Iraq (2009), Jordan (2004), Mauritania (2013), Morocco (2004), State of Palestine (2017), Qatar (2010), Somalia (2002/2003 Survey and Population Estimation Survey (PESS), 2014), the Sudan (2008), Syrian Arab Republic (2004), Tunisia (2014), Yemen (2004)	Population	Total population, age-specific population
United Nations	Algeria, Egypt, Iraq, Jordan, Mauritania, Morocco, State of Palestine, Qatar, Somalia, the Sudan, Syrian Arab Republic, Tunisia, Yemen (respective years)	Population prospectus	Projected population
		Model Life Table	United Nations Model Life Table
World Development Indicators (WDI), World Bank and Labour Force Surveys (LFS)		GDP growth rate	GDP, annual growth rate in GDP
		Urbanization	Percentage of population living in urban areas, percentage of urban population in a major city, persons per urban household
		Education	Primary/secondary level school: age at entry; enrollment rate (percentage); students per school teacher; students per school; recurrent expenditure per school student (dollars)
		Employment	Labour force participation rate: male and female
		Migration	Net migration
		Agriculture	Arable land (million hectares), base year production of major crop (thousand metric tons), annual growth in production of major crop (percentage), annual per capita consumption of major crop (kilograms)
Global Health Observatory, World Health Organization (WHO)		Life expectancy	Life expectancy at birth: male and female
			Health workforce
			(Population per doctor, population per hospital bed, population per nurse, population per health centre, population per hospital)
			Annual health expenditure per person

Official and private statistics and reportsb,c,d	Algeria, Egypt, Iraq, Jordan, Mauritania, Morocco, State of Palestine, Qatar, Somalia, the Sudan, Syrian Arab Republic, Tunisia, Yemen (respective years)	Family planning	Expenditure (cost and fee), effectiveness, impact rates
		Post-abortion care	Percentage of abortions that are legal, percentage of illegal abortions that need treatment, percentage of maternal deaths due to abortion, relative risk of mortality for untreated versus treated abortions, cost per abortion complication treated, cost for family planning counselling/ service per case

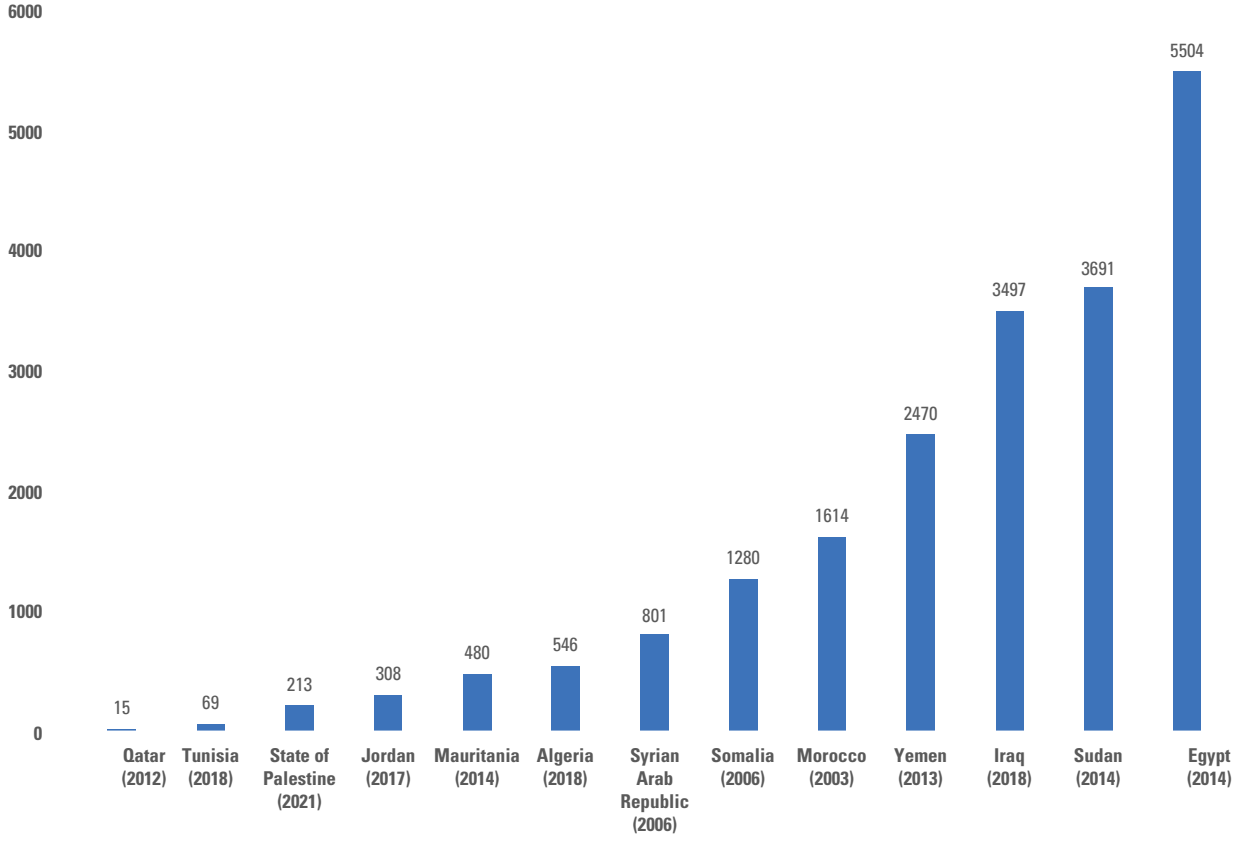
Sources: Inner City Fund (ICF), (2000–2020); United Nations Children's Fund (UNICEF), (2011–2014); The World Bank Group (2000–2021); World Health Organization (WHO) (2000–2020); United Nations (2022b).

a A more recent version of the Egypt Family Health Survey was launched in 2021 but is not included in this report due to the timing.

b Rana and Goli, 2017.

c Guttmacher Institute,2021.

Figure A.1 Total number of women who married before age 18 in Arab countries (in thousands)



Source: Estimated using a triangulation of DHS, MICS and United Nations Population Prospects.

Table A.2 Methodological note: Detailed explanation of methods and assumptions in DemProj, FamPlan and RAPID modules of spectrum-based simulation approach

Estimation of input indicators and assumptions

The study used three key modules of the spectrum-based simulation approach: DemProj, FamPlan and RAPID. The input indicators and their assumptions in these three modules are described below.

DemProj module

Population projections

Population projection is a scientific tool that integrates various components of change to project future population and composition. For the projection of population for the Arab region from 2001 to 2050, the DemProj module of the spectrum projection function has been used. The population of 2001 has been used as the base year for the projection. This study used 2001 as a base year which allows for evaluating the validity and suitability of the model by comparing the projected and actual populations for the period 2001–2021.

Age-sex distribution of a population

The age-sex distribution of the population for the base year is compiled from the censuses of the respective countries and the World Population Prospects, updated by the United Nations. For a high-quality base year input, the age-sex disaggregated data obtained for the base year from the respective country censuses have been adjusted for non-sampling errors, and those who did not state their correct age have been distributed proportionately across other age groups.

Fertility levels

In this study, fertility levels are measured by a widely used indicator of fertility: total fertility rate (TFR). The trajectory of fertility for the Arab region is the most contested component in its population projections. Keeping this in mind, the study used standard methods for deriving TFR levels for all three different scenarios for both base year and goal post year. This method comprises three steps: (1) The study estimates fertility differences for three different scenarios (i.e. child marriage scenario, non-child marriage scenario, and overall scenario (as usual scenario)) in the base year using microdata from the surveys; (2) the study considers the TFR level for the goalpost year (i.e. 2050) from the median variant projection of World Population Prospects (2019) for the "as usual" scenario; and (3) the study derives the TFR level for child marriage scenario by subtracting the base year difference between the child marriage scenario and the as usual scenario. Similarly, for the non-child marriage scenario, the study derives the TFR level for the child marriage scenario by adding the base year difference between the child marriage scenario and the as usual scenario.

Age distribution of fertility

With significant improvement in family planning and consequent fertility decline in countries, a definite shift in the age distribution for births is also observed. However, such a shift varies for child married women compared to non-child married women. We estimate the age-specific fertility rate for the women in age-group 15–49 years from 2001 to 2021 using survey data from the respective Arab countries. DemProj routinely optimizes the distribution of births as per the imputed assumption of the TFR. Thus, under the usual fertility scenarios, the distribution of births post-optimization process is mainly concentrated in the age group of 24–34 years, whereas a significant decline in births is observed in women aged below 20 and above 40 years. However, this distribution varies significantly for child married women compared to non-child married women. This study used three separate age distributions of fertility for three different scenarios (i.e. scenario of child married women, non-child married women, and total women or as usual scenario) assumed for the model.

Sex ratio at birth

Country-level sex ratio at birth approximations in the model for all three scenarios are estimated from the microdata, while the projected figures for the goalpost year in the case of the "as usual" scenario are adopted from World Population Prospects (2019). Keeping the difference found in microdata for sex ratio at birth estimates for child married and non-child married mothers constant up to the goalpost year, the study derives the sex ratio at birth estimates for the child marriage scenario by subtracting the difference found in the base year from the median variant sex ratio at birth estimate for the respective countries from the World Population Prospects (2019). Similarly, for the non-child marriage scenario, we have added the difference found in the base year from the median variant sex ratio at birth estimate for respective Arab countries from the World Population Prospects (2019).

Life expectancy at birth

Construction of a life table for populations with no or the least number of child marriages and those with the highest number of child marriages would be the ideal condition to derive the life expectancy at birth differences across the women who married below age 18 and those who married at 18 and above. However, construction of the life table for these sub-populations is not only a tedious job but also time- and resource-consuming. This study derived life expectancy at birth estimates for three different scenarios based on the experience of two different sets of geographies: the life expectancy at birth levels in provinces with the least number of child marriages are assumed to have the standard as non-child married women, while the life expectancy at birth of countries with the highest number of child marriages are assumed to have the standard as child married women. For the overall or as usual scenario, we considered a country's overall life expectancy at birth value of females.

Model life tables

The study used the Coale-Demeny model life table West regional patterns for underlying mortality patterns for estimation and projection. Previous literature suggests that mortality estimates using the West model have been more consistent in comparison with actual data for Arab countries (Stover, Heaton and Ross, 2006).

International migration

Migration is the third-most important component of population projection. The country-specific international migration (along with refugee population) is estimated using censuses, World Development Indicators of the World Bank and other official statistics.

Single-year age estimates of population, fertility and mortality

The spectrum simulation procedure also requires inputs of single-year age estimates of population, fertility and mortality rates and thus necessitates a transformation of estimates from a five-year age cohort to a single-year age. The base year population in the five-year age group has been converted into single-year age population using Beers's (1945) methodology. Following the same methodology, age-specific mortality rates, age-specific fertility rates and age-specific net migration rates have been split into a single-year age distribution. For the subsequent years, the population is projected using the cohort component method as follows:

$$P_{a,s,t,j} = P_{a-1,s,t-1,j} + 0.5 * (Mig_{a-1,s,t-1,j} + Mig_{a,s,t,j}) - Death_{a,s,t-1,t,j}$$

where $P_{a,s,t,j}$ is the population of a particular sex s at age a, at time t under the j^{th} scenario. $Mig_{a,s,t,j}$ refers to the migrant population of a particular sex s at age a, at time t under the j^{th} scenario. The $Death_{a,s,t-1,t,j}$ indicates the number of persons of a particular sex s that died at age a, between midyear and midyear under the j^{th} scenario, which is given as follows:

$$Death_{a,s,t-1,t,j} = P_{a-1,s,t-1,j} + 0.5 * (Mig_{a-1,s,t-1,j} + Mig_{a,s,t,j}) * (1 - (Survi_{a-1,a,s,t-1,j} + Survi_{a-1,a,s,t,j}) * 0.5)$$

where $Survi_{a-1,a,s,t,j}$ indicates age-specific survival rates between age a-1 and a for the person of a particular sex (s = male or female). Once the male and female populations between two time periods have been estimated, it becomes important to estimate the number of births that occurred between two midyears. The mathematical formula for estimation of births is given as follows:

$$B_{t,t-1,j} = \sum_{a=15}^{49} [Fp_{a,t-1,j} + Fp_{a,t,j} * 0.5] * [TFR_{t-1,j} + TFR_{t,j}] * 0.5 * [ASFR_{a,t-1,j} + ASFR_{a,t,j}] * 0.5$$

where $Fp_{a,t,j}$ is the female population at age a and time t and $ASFR_{a,t,j}$ is the age-specific fertility rate corresponding to age a at time t in the j^{th} scenario.

On multiplying the number of births by the corresponding sex ratio at birth, the number of male and female births is estimated. The births are then multiplied by their corresponding survival functions and placed in the initial age group 0–1 year. So, the population in the age group 0–1 is given as follows:

$$P_{0,s,t,j} = (P_{0,s,t-1,j} + P_{0,s,t,j}) * 0.5 * Survi_{0,s,t,j}$$

The population in the age zero bracket is replaced and projections for the subsequent years are carried out using the same iterative procedure until the final projection year is reached.

FamPlan module

This module is very useful in the sense that it captures various demographic and health parameters of the costing model for a country, especially in the context of child marriages and reproductive age group women. The key dimensions include fertility and use of different family planning methods, the impact of family planning, demographic events, fertility-related risks, mortality rates, post-abortion care, and associated costs and revenues. The spectrum module DemProj is integrated with other modules such as FamPlan and RAPID (Stine and Schmitz, 2013). Unlike other modules, FamPlan is an impact assessment module linked with DemProj that undertakes assumptions for reaching the family planning and fertility goals in a country. Specifically, it integrates the age-sex disaggregated population obtained from DemProj and applies it to two data types: first, the proximate determinant of fertility, and second, programme characteristics such as methods and source mix of modern contraception. The approach here is based on achieving desired fertility rates. The estimation in FamPlan is based on the famous proximate determinant of fertility framework (Bongaarts, 1978; Bongaarts and Stover, 1986; Bongaarts and Potter, 2013). The desired fertility levels and corresponding trajectories are provided in the DemProj and FamPlan modules (as explained in the previous section on DemProj). The goal for each year for the identified jth scenario (j=1 for TFR of child married women; j=2 for TFR of overall women; j=3 for TFR of non-child married women) until the final year is estimated as follows:

$$TFR_{t,j} = TFR_{2001} - (TFR_{2001} - TFR_{g}) \times PercentReductiont,k$$

where $TFR_{g,j}$ is the value of TFR at the end years (2050) in j^{th} scenario, and percentage reduction refers to the gap between actual TFR and TFR at the goalpost year of 2050. However, we assume that the differences in TFR across the three scenarios are persistent till the goalpost year, 2050. So, once the TFR at year t is estimated, the corresponding prevalence of contraception is computed from the proximate determinant frameworks as follows:

$$C_{prev,t,j} = (1 - TFR_{t,k,j} / (C_{m,t,j} \times C_{i,t,j} \times C_{a,t,j} \times C_{s,t,j} \times TF)) / (1.08 \times C_{eff,t})$$

where $C_{prev,t,j}$ = contraceptive prevalence at time t; $C_{m,t}$ index of marriage; $C_{i,t}$ index of insusceptibility; $C_{a,t}$ index of abortion; $C_{s,t}$ index of sterility; TF is total fecundity; and $C_{eff,t}$ the average effectiveness of all contraceptive methods at time t.

Proximate determinants of fertility

The proximate determinants of fertility include a set of behavioural and biological variables that have a direct impact on the fertility outcome. These include the percentages of women who are married or in a union, postpartum insusceptibility, total abortion rate and sterility. For the base year of the projection, i.e. 2001, the values for the percentage of women who are married or in a union and the duration of postpartum insusceptibility have been estimated from the survey data for three different scenarios, and the values between the surveys have been interpolated. The percentage of women who will be married or in a union in 2050 is assumed to be lower than the percentage in 2001 because of the increasing median age at marriage. Similarly, postpartum insusceptibility is assumed to be lower than the estimate in 2001 because of a decreasing trend in the duration of breastfeeding practices. The total abortion rate and sterility remain the same

as those estimated for India throughout the projection period (Stover, Heaton and Ross, 2006) because these values are less likely to change over time.

Contraceptive method mix and source mix

Contraceptive method mix refers to the percentage of contraceptive users by a method to the total number of users. Thus, the sum of the contraceptive methods is 100 per cent. The method mix has been calculated from contraceptive users as reported in microdata from the surveys. For the base year, the estimates from the respective country survey data have been used. During the inter-survey period, the values are interpolated using the linear interpolation method. For the year 2050, a contraceptive method mix has been taken from the developed countries for the overall scenario, but differences observed between child married and non-child married women are retained for the goalpost year as well. Values between 2021 and 2050 are filled with the interpolated estimates obtained for all contraceptive methods separately and the corresponding method mix and users of each method. It can be expressed as follows:

$$CP_{a,m,t,j} = MethodMix_{a,m,t,j} \times CP_{a,t,j}$$

where $CP_{a,m,t}$ is the contraceptive prevalence for a particular method m among users of age a at time t under j^{th} scenario; $MethodMix_{a,m,t}$ refers to the share of all users using specific method m, at time t; and $CP_{a,t}$ contraceptive prevalence among users aged a at period t.

Also, the numbers of users of each method are estimated by multiplying method-specific prevalence $CP_{a,m,t}$ with married women of the reproductive age group.

$$USERs_{a,m,t,j} = CP_{a,m,t,j} \times MWAR_{a,t,j}$$

where $USERs_{a,m,t}$ refers to users of a particular method m among users of age a at time t and $MWAR_{a,t}$ married women of reproductive age a at time t.

The source mix is the percentage of contraceptive users who receive their services from different sources. The sum of the source mix is 100 per cent. For this study, the sources are defined as public, private and non-governmental organizations (NGOs). The information from 2001 to 2021 on the source mix is collected and estimated from the microdata. For the information during the inter-period projection, the values have been interpolated: various sources p for contraceptive method m is computed as follows:

$$USERs_{a,m,p,t,j} = USERs_{a,m,t,j} \times SourceMix_{m,p,t,j}$$

where $USERs_{a,m,s,t,j}$ is the number of methods that users of reproductive age a at time t rely upon source s for specific contraceptive method m under scenario j; $SourceMix_{m,p,t,j}$ refers to the share of users receiving specific contraceptive method m from sources s at time t under j^{th} scenario. For the final year of the projection (2050), the share of public sources has been reduced, and the share of private sectors and NGOs has been increased based on the current scenario in developed countries. Thus, over the year, expenditure on family planning may be reduced in the

public sector and the share may be increased in both the private sector and NGOs in the future. Thus, the source of contraceptive methods in the final year of the projection may be equivalent to that of developed countries.

Child survival

The inputs for child survival are needed for the base year, i.e. 2001. The indicators for child survival include the percentage of births with any risk involved, the infant mortality rate (IMR) and under-5 mortality rate (U5MR) in the survey years, the relation of risky births to contraceptive use, the relation of IMR to risky births and the relation of under-5 mortality to risky births. Using microdata, the IMR, U5MR and percentage of risky births have been estimated for three scenarios: child married women, non-child married women and overall women. All coefficients for the relationships are assumed to be the default (Stover, Heaton and Ross, 2006).

Cost of services and consultation fees

The cost of services on contraceptive methods is taken from country-specific official reports for the year 2001. The "regression" option of the FamPlan module allows for the projection of future costs per user assuming a certain relationship. It assumes that the cost of services will decrease with an increased number of users or acceptors for a particular method (Stover, Heaton and Ross, 2006). The consultation fees for the contraceptive methods are varied across the sources of supply. The public sector supply is free of cost. The fees for NGOs are assumed to be half of those of the private sector because NGOs are generally non-profit organizations while health institutions are for-profit. The consultation fees for male and female sterilization may be equivalent to those for a C-section delivery, which are estimated by using country-specific microdata. The fees for other modern methods of contraception are collected from the country-specific official reports on health statistics.

Method attributes

Method attributes refer to the durability of each contraceptive method. For the limiting methods, the average age of female and male sterilization is considered to be 26 years throughout the projection period. For long-acting reversible contraceptive methods, the average durations for Implanon (implant), copper T intrauterine device (IUD) and levonorgestrel-releasing intrauterine system (LNG-IUS) are two years five months, four years six months and three years three months, respectively. The method attributes for the short-term contraceptive methods are defined as the number of units required for one-year protection of a couple. The number of units for condoms, daily pills (one cycle), injectables (Depo-Provera for three months) and the lactational amenorrhea method are 120, 4, 15 and 0.3, respectively.

Lactational amenorrhea method

Lactational amenorrhea method is a one-time input for the base year (one-time entry). The percentage of women who use the lactational amenorrhea method by months has been estimated from the survey data of the respective countries.

The effectiveness of contraceptive methods, impact rates and miscarriage rate

The information on the effectiveness of contraceptive methods has been taken as standard rates proposed by Stover, Heaton and Ross (2006) based on observation of the data from global experiences. All indicators of impact rates (one-time entry) have been either estimated from the country-specific microdata, or taken from official statistics of the respective countries. The miscarriage rate varies between 10 per cent and 20 per cent across the globe (Stover, Heaton, and Ross, 2006). For the Arab region, at the base year (one-time entry), this rate is considered to be 15 per cent (0.15).

Post-abortion care

The percentage of legal abortions has been calculated from the sex ratio of each decennial census assuming that the imbalanced sex ratio at birth is the result of illegal abortions. The percentage of legal and illegal abortions that require treatment is taken from published reports (Cohen, 2009; Singh and others, 2018). The percentage of maternal deaths due to abortion (5.9 per cent) is taken from a study by Say and others (2014). The annual expenditure for post-abortion care at the base year of projection (single entry) is assumed to be the same as the cost of postnatal care and delivery cost reported in the previous studies (Cohen, 2009). The cost per abortion complications treated is assumed to be the same as in the Cohen (2009 references). The cost of annual family planning counselling or service per case has been assumed to be the same as the fees for medical consultation in the previous studies (Singh and others, 2018). The cost of abortion complications treated and family planning counselling or service fees are adjusted with inflation for the following years and deflated for the previous years during the projection period.

Distribution of fertility-related risk

The distribution of fertility-related risk is represented by the percentage of women at different age groups and birth order and by the percentage of children at groups of birth interval. These percentages have been estimated from the country-specific microdata.

RAPID module

The RAPID module of the spectrum simulation model is an organized tool for estimating the workforce and economic outcomes aiming to meet the desired social and economic goals in a country. At the same time, it also provides the socioeconomic requisites to enable achieving various country-specific targets within the stipulated time frame. In the RAPID module, we use the projected age-sex population totals and other demographic parameters from the DemProj for different sectors such as the economy, health, education agriculture and urbanization. We discuss two major aspects (education and health) of the RAPID module in detail under the three costing projection scenarios.

Economic input indicators

For the RAPID module, we included an array of economic input indicators and those also recognized by previous eco-demographic studies as critical factors of determining and predicting a country's economy (Coale and Hoover, 1958; Barro, 1991; Lee, Mason and Miller, 2000; Bloom, Canning and Sevilla, 2001; Kelley and Schmidt, 2005). Our model includes the labour force participation rate for males 10–14 years old, labour force participation rate for males 15–64 years old, labour force participation rate for females 10–14 years old, labour force participation

rate for females 15–64 years old, GDP at the base year (one-time entry) in USD and percentage annual growth rate in GDP. The labour force participation rates for both males and females 10–14 years old are obtained from different census rounds, with 2001 as the base year; the estimates of the labour force participation rate obtained from the census rounds have been duplicated for the inter-census period. Among both male and female children 10–14 years old, we assume labour force participation rate to be 0.01 per cent in 2050, considering child labour may reduce to nearly zero under the best scenario as a result of the accelerated effort to eradicate child labour in the Arab region. Among the males 15–64 years old, under the best scenario, the labour force participation rate is assumed to be 86 per cent in 2050 despite the current trend showing a stagnation or decline. This is also equivalent to the labour force participation rate level in developed countries (World Bank, 2021). The highest labour force participation rate for females worldwide is observed in developing countries such as the United Republic of Tanzania and Zimbabwe, where it has reached approximately 79 per cent; for the developed countries, the labour force participation rate is approximately 65 per cent (World Bank, 2021). Since we always use developed nations as a benchmark, we assume that Arab countries will reach a labour force participation rate of 65 per cent in 2050. The assumption concerning the GDP growth rate is the most complex and uncertain process considering that it is the most volatile indicator that depends on several economic, political, health elements and related shocks. In the light of the past growth trajectory and current growth rate, we have set short-term growth targets. The goalpost, meanwhile, has been set based on the GDP growth rate of large developed economies. Hence, the annual growth rate in 2050 has been assumed to be 4 per cent, with an initial growth rate of 8 per cent until 2035, 7 per cent until 2045 and 6 per cent until 2050. Similarly, the total GDP for the base year is taken from the official statistics of the respective countries. However, all the above said economic inputs are estimated for three different scenarios: child married women, non-child married women and as usual.

Educational input indicators

The educational input indicators for the RAPID module consider the age of entry into school (one-time entry), the number of years of schooling (one-time entry), the enrolment rates of schools (in percentages), the number of students per teacher, and the number of students per school separately for both primary and secondary schools. The age of entry into primary and secondary schools at the base year (2001) is 5 and 11 years, respectively. The number of years of schooling is five years each for both primary and secondary schools. The gross enrolment ratio is collected from country-specific official statistics. For 2050, the gross enrolment ratio is assumed to be 100 per cent for both primary and secondary schools, since, after more than four decades, almost all children in Arab countries are expected to enrol in schools up to the secondary level. The statistics on the number of students per primary and secondary school are obtained from country-specific official statistics. The student-to-teacher ratio is assumed to be 13, as observed among the developed countries. However, all the above said economic inputs are estimated for three different scenarios: child married women, non-child married women and as usual.

Health input indicators

The indicators of health for inputs in the RAPID module are population per doctor, population per nurse, population per health centre, population per hospital, population per hospital bed and annual health expenditure. The statistics on the population per doctor, nurse, health centre, hospital and hospital bed during 2001–2050 are taken from the World Development Indicators

database (World Bank, 2021). For the year 2061, the statistics have been taken from developed countries, as Arab countries may achieve an equivalent health infrastructure in the next four decades (World Bank, 2021). The annual health-care expenditure per capita for the year 2014–2015 is taken from the National Health Accounts of the respective Arab countries. The amount includes the expenditure from public and private sectors and donations from international agencies. For the estimates for the projected years until 2050, the expenditure has been adjusted with the current rate of inflation. However, all the above said health inputs are estimated for three different scenarios: child married women, non-child married women and as usual.

For more details, see supplementary material.