Evaluating the Impact of Millennium Development Goal 5 on Universal Access to Reproductive Health

Background and Research Question

Global initiatives and commitments to health and development inevitably call for evaluation of progress, and ultimately a review of impact. Timely reporting assists with evidence-based review and decision-making, but, can be challenging when – as is usually the case – end-line data are not immediately available.

The United Nations (UN) Millennium Declaration was adopted in 2000 by all the world's countries and leading development institutions, setting out eight Millennium Development Goals (MDGs) to be achieved by 2015 (UN General Assembly 2000). In 2000, there was no indicator associated with family planning. As a result of advocacy efforts, in 2005, MDG 5 (improve maternal health) included two new indicators (United Nations Statistics Division n.d.), MDG 5.3 Contraceptive Prevalence (Percentage of women age 15-49 years currently married or in union who are using (or whose partner is using) a contraceptive method, and MDG 5.6 Unmet Need (Percentage of women age 15-49 years who are currently married or in union who are fecund and want to space their births or limit the number of children they have and who are not currently using contraception), within Target 5.B "Achieve, by 2015, universal access to reproductive health". Both indicators were reported for any method (the sum of modern and traditional), and estimates were sourced from nationally representative household surveys.

In 2015, the United Nations published the Millennium Development Goals Report (UN 2015), in which it was reported that contraceptive prevalence (CP) increased from 55% in 1990 to 64% in 2015, worldwide, yet 12% still had an unmet need for family planning in 2015. A limitation of these results is that the surveys providing insights into these indicators for the end of the MDG period were not yet available and the estimates for year 2015 were projections based on surveys that took place in 2014 or earlier.

In this paper, we employ recently-developed methods using a Bayesian Hierarchical Model to provide insights to the question "Did the 2005 inclusion in the MDGs of Target 5.B, contribute to accelerated progress in family planning?". We develop a scenario based on "historical trend" in family planning indicators, that would have been expected based on data as of 2005. We compare the results of this scenario against the published Bayesian hierarchical model-based estimates (United Nations 2018a). By running the analysis in 2018, three years after the conclusion of the MDGs, we have a better and more precise understanding of the situation in 2015 than we had in the year 2015 (because the most recent surveys are now available, up to 2017), and so are better able to assess the progress between 2005 and 2015.

We argue that this approach can be used to assess the impact of other initiatives, such as Family Planning 2020 (FP2020) and the Sustainable Development Goals (SDGs). We stress the value of conducting evaluations several years after the end of an initiative and discuss the advantages and limitations of the statistical methods applied to the national and global assessments.

Data and Research Methods

Data were compiled from all nationally representative surveys that provide information on contraceptive prevalence, such as Demographic and Health Surveys (DHS), Multiple-Indicator Cluster Surveys (MICS), Performance, Monitoring and Accountability (PMA) 2020 surveys, and a wealth of national surveys. We obtained 1,200 observations of CP (of which 164 were MICS) across 195 countries, and 499 observations of unmet need, for married or in-union women over the period 1950-2017 (UN Population Division 2018b). Where available, we used micro data sets, otherwise we used estimates derived from the published tabulations and specially requested tabulations from data collecting institutions.

A Bayesian hierarchical model was used to produce national, sub-national, and global probabilistic estimates and projections of contraceptive prevalence and unmet need, for married or in-union women age 15-49 from 1970-2030 (Alkema 2013). Results from this model are published once a year (UN 2018a), using the latest survey data. Median and uncertainty intervals are used to examine the situation in 2015.

We use results from the published 2018 Revision (UN 2018a), to estimate the "true" situation in 2015; this is what actually happened, based on all available data. We then run a new scenario, in which observations from surveys that started field-work after 2005 were excluded. This scenario is the historic trend as of 2005, imagining a world in which there had been no MDG5B. It looks at what would have been expected to happen in 2015, prior to the inclusion of MDG5B. We compare results from this historic scenario, to results from the published 2018 Revision.

Expected Findings

Prior to 2005 there were 800 surveys providing an observation of CP across 190 countries, of which 57 were MICS. Following 2005, there were an additional 400 surveys. The majority of observations of unmet need (259) were after 2005. MICS surveys included estimates of contraceptive prevalence in early surveys, but unmet need for family planning was only included in MICS after 2005, motivated by unmet need becoming an official MDG indicator, and renewed interest in family planning. There are 72 observations of unmet need from MICS surveys in total, all of which are for surveys from 2006 onwards.

Medians and 95% uncertainty intervals of contraceptive prevalence and unmet need amongst married/in-union women aged 15-49, according to the 2018 Revision, and according to the new scenario (historic trend, pre-2005 data only) are presented in Figure 1. Overall, the historic scenario projected higher levels of CP and lower levels of unmet need in 2015, than what actually occurred in 2015. The historic scenario for the world projected a CP of 65.7% but the 2018 Revision indicates it was 62.5% in 2015, the respective figures for unmet need were and 11.6% and 11.7%, not too dissimilar from what was published in the 2015 MDG Report (UN 2015). In other words, the field of family planning did not perform as well in 2015 as had been expected at the time that Target 5B was included in the MDGs. The uncertainty intervals for the historic scenario are wider, which is to be expected, given the projections for 2015 were based on fewer and older data. As a result, the 2015 medians from the 2018 Revision tend to fall within the 2015 uncertainty intervals of the historic scenario for the majority of sub-regions (exceptions are discussed later). While not a formal test, this is an indication that after accounting for uncertainty, there is generally no significant difference between the estimates from the two model runs.

The sub-regions South America, Northern Europe, and Eastern Africa are different to the overall pattern; the 2018 Revision estimates slightly better performance in the family planning indicators than the historic scenario, but these differences are marginal. The good performance in South America (median of 77.4% CP in 2015 according to 2018 Revision, compared to 73.7% under historic scenario) is due to continued growth in contraceptive use even at higher levels, for example in Colombia.

Several countries in Eastern Africa are used as examples in which uptake of contraception has been exceptionally fast in recent years. The 2018 Revision estimate for 2015 exceeds the historic scenario projection in Ethiopia (37.0% actual versus 30.0% historic), Kenya (62.5% versus 55.4%, Figure 2), Malawi (58.2% versus 48.9%), and Rwanda (53.2% versus 27.9%). However, the performance overall for Eastern Africa in 2015 is no more exceptional according to the 2018 Revision (40.8%), than what had been projected in 2005 (40.7%, Figure 1), and the successes in these countries are tempered by under-performance in other populous countries of E. Africa.

Middle Africa and Western Africa stand out as sub-regions in which estimates from the 2018 Revision show progress to be significantly behind what would have been expected in 2005 under the historic scenario (21.8% versus 37.1% for Middle Africa, 17.8% versus 25.7% for Western Africa); the uncertainty intervals scarcely overlap, despite there being fewer input observations. For example, the 2018 Revision estimate for the Democratic Republic of Congo is 22.5% for 2015, but it had been projected to be 44.6% under the historic scenario (Figure 3).

Discussion

Despite the efforts of the MDGs, the world and most sub-regions did not perform as well in 2015 as what would have been expected in 2005. Some individual countries exceeded expectations, but our analysis demonstrates that a majority of sub-regions, most especially Middle Africa and Western Africa, are lagging behind compared to

what had been expected for them in 2005. For other regions, the uncertainty in the model-based estimates, particularly the historic model run, was large and this made it difficult to infer any difference between the runs.

It is not possible to attribute change in contraceptive prevalence or unmet need entirely to one initiative, such as the inclusion of Target 5.B to the MDGs. There were concurrent political, social, and economic changes during this period, for example changes in the USA administration, the global economy, and the launch of FP2020, which all could have impacted on progress in family planning, in differing ways.

The family planning community is now better equipped with the tools to evaluate change, than in 2005. The approach taken here could be used to provide insights on the impact of other initiatives, such as the SDGs and FP2020. We recommend conducting this type of analysis several years after the conclusion of an initiative, in order to make use of most recent data, which can take some years to become available, so as to provide insights on the end of the initiative. Our approach could also be used to set ambitious yet achievable targets for an initiative, by using all available data to produce family planning projections with uncertainty intervals for the conclusion year of an initiative. This could be at the national, regional or global level, for example as the family planning community looks to the post-2020 family planning agenda.

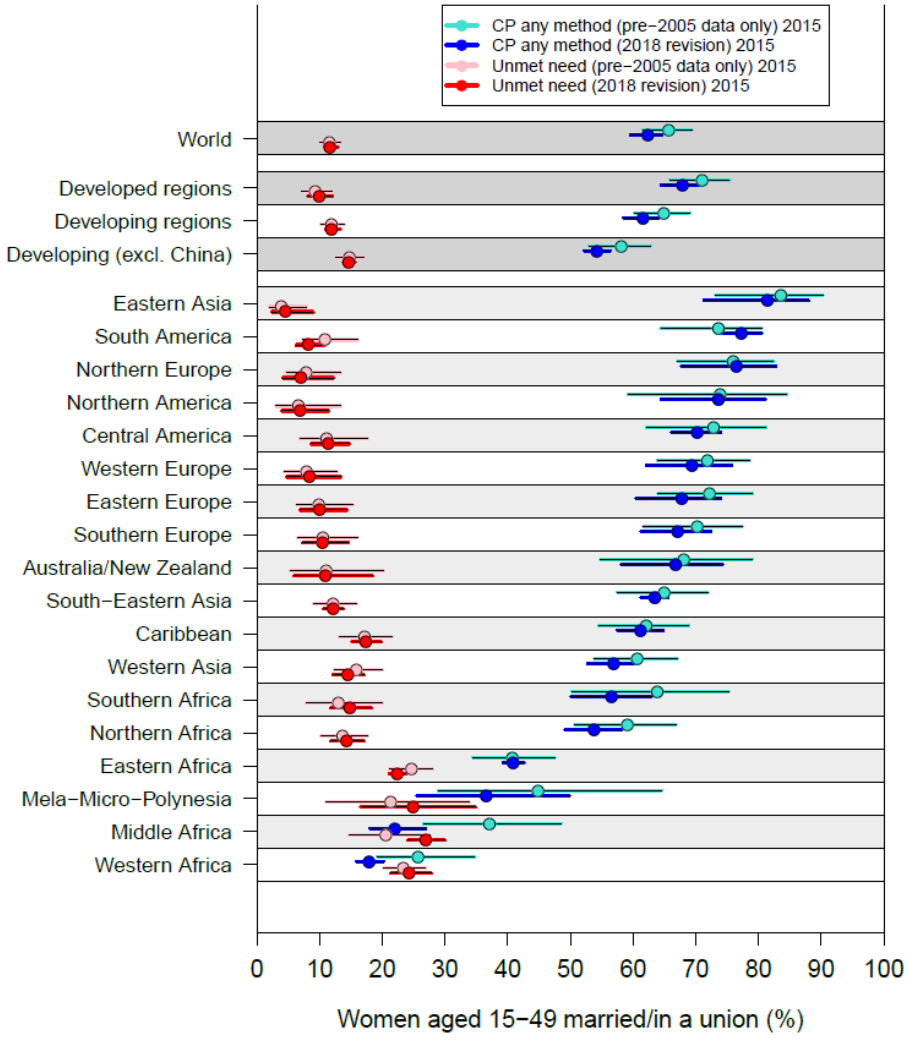

Figure 1: Percentage of married/in-union women aged 15-49 who used any contraceptive method (CP) or who had an unmet need for any method in 2015, according to: a) the 2018 Revision, b) new scenario with pre-2005 data only. The 95% uncertainty intervals are displayed by horizontal lines.

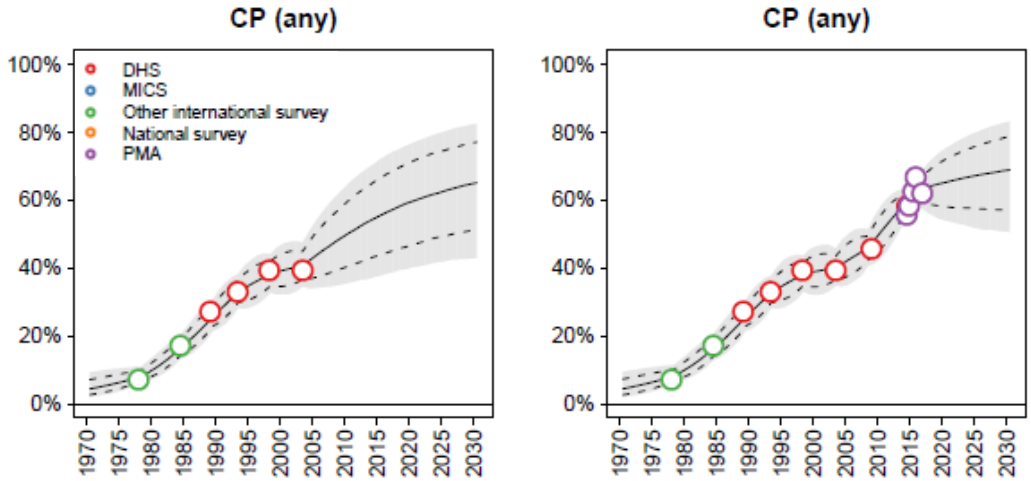

Figure 2: Percentage of married/in-union women aged 15-49 who used any contraceptive method, Kenya a) historic scenario (left panel), b) 2018 Revision (right panel). Colored circles indicate observations from surveys.

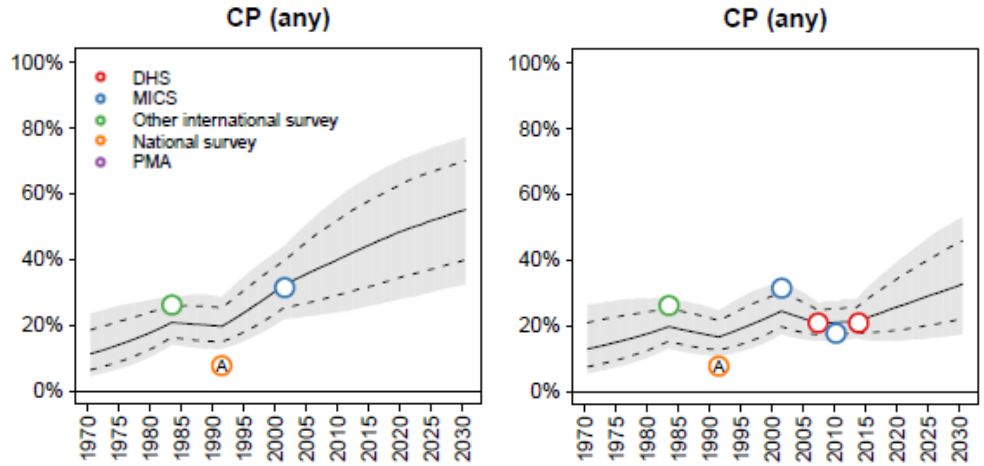

Figure 3: Percentage of married/in-union women aged 15-49 who used any contraceptive method, Democratic Republic of Congo a) historic scenario (left), b) 2018 Revision (right panel). Colored circles indicate observations from surveys. 'A' marks surveys that targeted an age group different from 15–49; potential biases due to this were addressed by including additional parameters in the model.

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