Exploring Contraceptive Use Differentials in Sub-Saharan Africa through a Health Workforce Lens

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Extraordinary gains have been made over the past 50 years in meeting the family planning needs of millions of people throughout the world. Currently, 56% of all married women are using a modern method of contraception (United Nations, Department of Economic and Social Affairs, Population Division 2011), up from less than 10% in 1960 (United Nations, Department of Economic and Social Affairs, Population Division 2004). This increase is driven by a growing demand for modern methods of contraception but has only been made a reality through the availability of and access to contraceptive supplies and health workers qualified to provide family planning services. Use of nearly all methods of modern contraception requires contact with a health worker—a doctor, nurse, midwife, community health worker, or pharmacist. As a result, access to trained health workers is a principal supply-side determinant of family planning service use. Although 13% of the world's population is located in sub-Saharan Africa (Population Reference Bureau 2011), less than 3% of the world's health workers are located on the subcontinent according to the most recent estimates (World Health Organization 2006). This lack of access to health workers is especially acute in sub-Saharan Africa where only 19% of married women use a modern method of contraception, the lowest regional contraceptive prevalence rate in the world (Population Reference Bureau 2011).

Sub-Saharan Africa's modern contraceptive prevalence rate (CPR) of 19% masks the important diversity in CPR values that exists across countries, ranging from 1% in Somalia to 60% in South Africa (Population Reference Bureau 2011). Distinct regional differences are also observed, with western and central Africa lagging far behind eastern and southern Africa. In a 2010 study, Cleland, Ndugwa, and Zulu examined trends and differentials in contraceptive readiness (percentage of women who wanted to have no more children or who wished to postpone childbearing for at least two years), willingness (percentage of women who expressed their approval of family planning and who believed that their partners were also in favor of it), and ability (percentage of women who knew about both contraceptive pills and injectables and where to seek family planning services) between eastern and western Africa (Cleland, Ndugwa, and Zulu 2011). Multiple rounds of data were analyzed from Demographic and Health Surveys (DHS) implemented between 1988 and 2007. Their analysis revealed that current use of modern contraception rose from an average of 7% in western Africa in 1991 to 15% in 2004, and from 16% to 33% in eastern Africa over a similar time period. Median values for the indicators of readiness, willingness, and ability were higher in eastern Africa than in western Africa at all time points, with eastern Africa showing impressive gains in all three measures over the time period studied. Western Africa experienced minimal gains in readiness and willingness but a pronounced increase in ability. For all three measures, the median value of the indicator for western Africa *at the end of the time period* was lower than the median value of the indicator for eastern Africa *at the beginning of the time period* studied.

The readiness, willingness, and ability measures of the Cleland, Ndugwa, and Zulu (2011) paper tap into both demand- and supply-side determinants of contraceptive use. The supply-side metric used in their analysis, *ability*, is a measure derived from women's *knowledge* of methods of contraception and where to obtain them, but it does not measure availability of and access to providers, commodities, and services. Therefore, we sought to build on the findings of Cleland, Ndugwa, and Zulu by undertaking additional analyses of supply-side differences between countries in eastern and western Africa, all of which are classified as having a health workforce crisis as measured by the health worker density ratio (World Health Organization 2006). Specifically, our study's objective was to explore if and how health workforce measures differ between eastern and western Africa, in an effort to identify factors that may have helped one group of health workforce crisis countries in eastern Africa to achieve important gains in CPR, while another group of crisis countries in western Africa has not.

It is important to note that many factors other than health workforce variables are critical in determining levels and trends in CPR, including demand for family planning, contraceptive commodity supply, and sociocultural factors such as female education. However, the investigation of non-health workforce variables or the interaction between health workforce and non-health workforce variables is beyond the scope of this study.

Analytic approach

Ten countries in sub-Saharan Africa were selected for this analysis—five from eastern Africa and five from western Africa. All 10 countries implemented a DHS in each of the following time periods: time 1, 1995–2000; time 2, 2001–2005; time 3, 2006–2011. In the 1995–2000 period, all of the countries had low or very low CPRs, ranging from 3% to 26% of married women of reproductive age. The five eastern African countries—Ethiopia, Madagascar, Malawi, Rwanda, and Zambia—had marked improvements in their CPRs over the 10–15 year time period, with gains ranging from 16 percentage points in Malawi to 39 percentage points in Rwanda. This group of five countries is herein referred to as the CPR-improved countries. The CPRs of the five western African countries—Benin, Ghana, Mali, Nigeria, and Senegal—remained low and, for the most part, stagnant with increases of less than five percentage points over the same time period. This latter group is herein referred to as the CPR-stagnant countries.

In our first analysis, we investigated trends and differentials in access to health workers in relation to use of modern methods of contraception among married women for the two groups of countries. The Health Workers Reach Index (HWRI) (Save the Children 2011) was used as the measure of health worker access. The index incorporates indicators on health worker density and use of health workers as measured by skilled birth attendance (SBA) and DPT3 immunization coverage. Index scores range in value from zero to one, with one being the best score for health worker reach. See sidebar for a more in-depth description of the HWRI and values of the HWRI for all 10 countries included in this study.

Next, we examined levels and trends in the values of two of the HWRI components (SBA and DPT3) in relation to levels and trends in CPR for the 10 countries. For several reasons, the health worker density ratio was excluded from the in-depth analysis. The DHS collects information on skilled birth attendance and DPT3 coverage, thus we had access to high-quality data on these two variables over a period of time. However, data for the health worker density ratio are not collected in DHS surveys. The health worker density ratio is considered to be of poor validity and reliability in that the data required for its estimation are highly variable with respect to timeliness, comprehensiveness, accuracy, and other dimensions of data quality.

The analysis of trends in SBA and DPT3 for the 10 countries over the 10–15 year period produced somewhat surprising results in that the countries did not fall neatly into the same two CPR groupings (e.g., SBA and DPT3-improved/stagnant countries). Consequently, we disaggregated CPR by geography (urban/rural), method type, and source of method (public/private), and then analyzed how trends and differentials in the disaggregated values varied between the two CPR groupings of countries.

Health Workers Reach Index

The Health Workers Reach Index (HWRI) is an additive index that incorporates three indicators: 1) health worker density ratio (number of doctors, nurses, and midwives per 1,000 population); 2) skilled birth attendance rate; and 3) DPT3 immunization rate.

The HWRI was proposed in 2011 as a more comprehensive measure of health worker access than the commonly used health worker density ratio by capturing both the availability and utilization of health workers. The HWRI incorporates measures of actual use of services provided by health workers (e.g., skilled birth attendance, DPT3) with health worker availability (e.g., health worker density ratio).

As is the case with the health worker density ratio, a significant disadvantage of the HWRI is its focus on doctors, nurses, and midwives. It does not directly capture the role that other cadres of health workers, such as community health workers and pharmacists, play in providing services.

Country HWRI values:

Ethiopia (0.287); Madagascar (0.414); Malawi (0.494); Rwanda (0.505); Zambia (0.438)

Benin (0.537); Ghana (0.523); Mali (0.416); Nigeria (0.303); Senegal (0.468)

Source: Save the Children 2011.

Potential health workforce explanations for the findings of these analyses were then developed.

The absence of high-quality data on health workforce variables in eastern and western Africa limits our ability to move beyond exploratory, descriptive analysis into explanatory analysis and to provide subsequent programmatic recommendations. However, we hope that the proposals we generate on potential health workforce underpinnings of differences between the two groupings of countries will encourage additional data collection and analysis on the association between health workforce variables and CPRs.

Results and discussion

Macrolevel trends in use of services provided by health workers: Given that health workers are needed to provide contraception, one might expect countries with higher HWRI scores to have higher CPRs. As shown in Figure 1, this is the case overall. As HWRI scores increase among the health workforce crisis countries, the CPR also tends to increase. *However, it is also apparent that there are countries with almost identical HWRI scores but very different CPRs.* This finding is illustrated more vividly in Figure 2, which shows the HWRI scores and CPR values for the 10 sub-Saharan African countries selected for this analysis. Unexpectedly, the HWRI scores for the CPR-improved countries cover the same range as do the scores for the CPR-stagnant countries. In fact, for every country in the CPR-improved grouping, there is a country in the CPR-stagnant grouping with approximately the same HWRI score.

To further explore this finding, we examined the two subcomponents of the HWRI derived from the DHS (SBA and DPT3) with a focus on trends in the values of these indicators for the two groupings of countries. Our intent was to ascertain if levels and trends in these two measures of health worker access were moving in the same or different direction as the CPRs: 1) for individual countries; and 2) for each grouping of countries over the 10–15 year time period. As stated previously, due to poor data quality issues and the fact that the health worker density ratio is not a DHS indicator that can be associated with a definitive time period and systematically analyzed over time, the health worker density ratio was not included in this subanalysis.

Skilled birth attendance and receipt of DPT3 require access to a health worker, as does the use of most methods of modern contraception. Yet Figures 3, 4, and 5 reveal that the CPR-improved countries did not necessarily experience greater percentage point increases in or higher levels of skilled birth attendance and DPT3 coverage than the CPR-stagnant countries over the study period. In fact, with respect to the most recent DHS values for these two indicators, many of the CPR-stagnant countries have been able to maintain or achieve similar levels of SBA and DPT3 coverage as have the CPR-improved countries (see appendix). Furthermore, in some instances, the CPR-stagnant countries have been able to establish better population coverage for specific health services. For example, Benin, a CPR-stagnant country, has achieved the highest national skilled birth attendance rate (78%) among all 10 countries for the most recent time period. Both Ghana and Senegal, CPR-stagnant countries, have higher national DPT3 immunization coverage (89% and 83%, respectively) in the most recent time period than three CPR-improved countries—Ethiopia (37%), Madagascar (73%), and Zambia (80%). Among the 10 countries, Rwanda, a CPR-improved

Figure 1. Contraceptive Prevalence Rate[1] and Health Workers Reach Index[2] in the Health Workforce Crisis Countries[3]
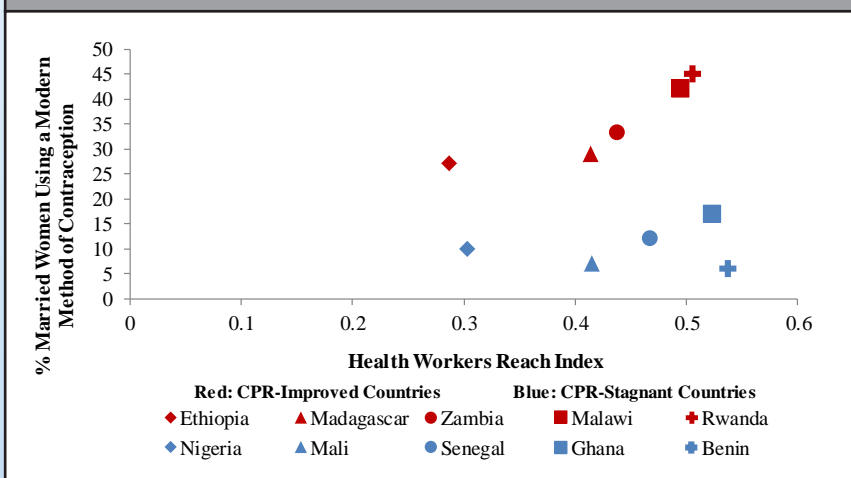
[1]Data source: Population Reference Bureau 2012.
[2]Data source: Save the Children 2011.
[3]Data source: World Health Organization 2006.
Note: Haiti, Angola, and Guinea-Bissau are excluded from the figure due to unavailable data.

Figure 2. Contraceptive Prevalence Rate[1] and Health Workers Reach Index[2] in Sub-Saharan African Countries

Red: CPR-Improved Countries   Blue: CPR-Stagnant Countries
◆ Ethiopia   ▲ Madagascar   ● Zambia   ■ Malawi   ✚ Rwanda
◆ Nigeria   ▲ Mali   ● Senegal   ■ Ghana   ✚ Benin

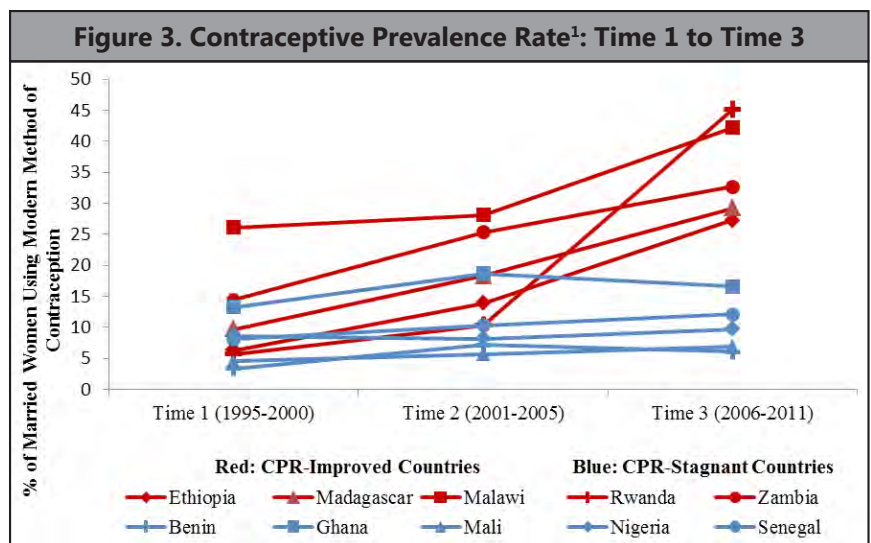[1]Data source: ICF International 2012.
[2]Data source: Save the Children 2011.

country, achieved the highest percentage point increase in SBA coverage (38) over the study period; however, Mali, a CPR-stagnant country, achieved the highest percentage point increase in DPT3 coverage (30).
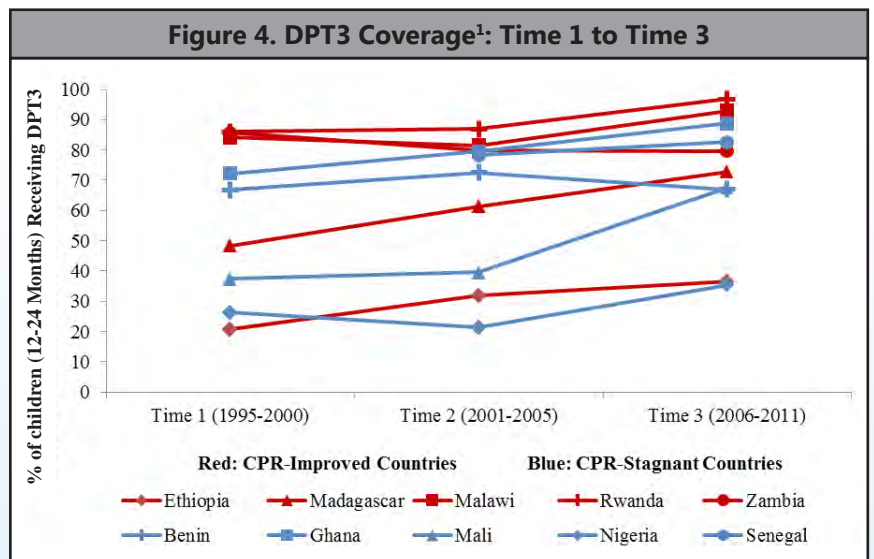
One implication of these findings is that *how* health workers are trained, distributed, and supported may be as important as *how many* health workers are available at the national level. CPR-improved countries may have made different decisions than CPR-stagnant countries about how to develop, deploy, and support their family planning health workforce, just as some CPR-stagnant countries with improved SBA and DPT3 rates may have made different decisions related to their maternal and child health workforces. To further explore this question, we examined differences in urban/rural contraceptive use, method type, and source of method among the 10 countries using DHS data.

Urban/rural differentials in use of family planning services: There are noteworthy differences between the CPR-improved countries and the CPR-stagnant countries in urban/rural CPR levels and trends (see appendix). Increases in modern contraceptive use among urban residents in CPR-improved countries are notable; however, it is the increase in contraceptive use in rural areas that is most impressive in these countries. Among the CPR-improved countries, all but Ethiopia had greater percentage point increases in contraceptive use in rural areas than in urban areas over the 10–15 year time span. In the CPR-stagnant countries, the increase in CPR was minimal at the national level during the time period, but more importantly, the small gains that did accrue resulted mainly from rural gains. Overall, very slight increases in urban use of contraception were experienced in the CPR-stagnant countries, with each of the five countries experiencing a decline in urban use of contraception over one of the observed time periods (between time 1 and time 2 or time 2 and time 3).
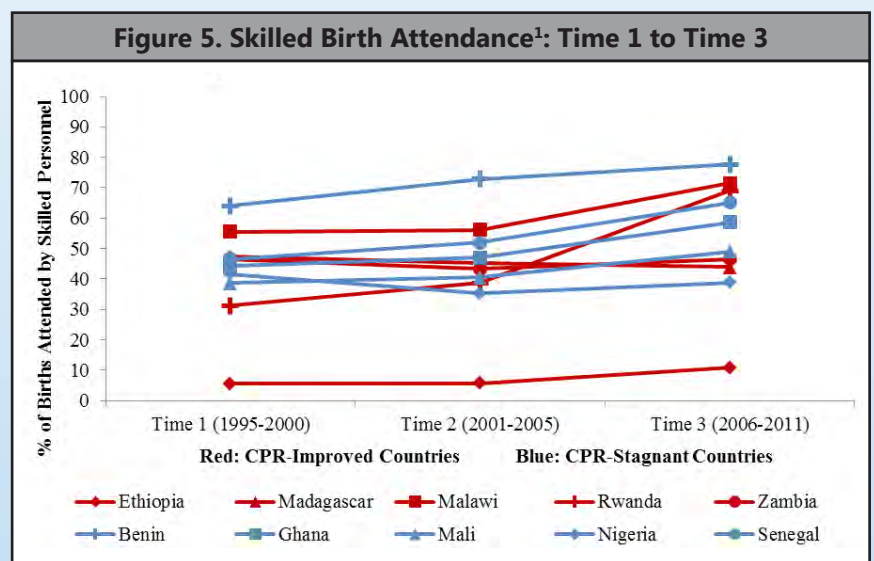
In order to fully understand the impact of these urban/rural differentials on the national value of CPR, it is also important to take into account each country's degree of urbanization (see appendix). In a country that is predominantly rural, increasing access to family planning service providers in rural areas will have a greater impact on the national value of CPR than it would in a predominantly urban country, all else being equal (e.g., urban/rural demand for family planning). Overall, the

Figure 3. Contraceptive Prevalence Rate[1]: Time 1 to Time 3

[1]Data source: ICF International 2012.

Figure 4. DPT3 Coverage[1]: Time 1 to Time 3

[1]Data source: ICF International 2012.

Figure 5. Skilled Birth Attendance[1]: Time 1 to Time 3

[1]Data source: ICF International 2012.

percentage of the population that is urban is much higher in the CPR-stagnant countries than in the CPR-improved countries. Over 40% of the population is urban in four out of the five CPR-stagnant countries, whereas none of the CPR-improved countries has reached this level of urbanization. In fact, the percentage of population that is urban falls below 20% in Ethiopia, Malawi, and Rwanda.

- *Health workforce determinants at play?* Urban contraceptive use remains higher than rural contraceptive use in all five of the CPR-improved countries. However, given that these countries are predominantly rural, the magnitude of the gains in rural areas may indicate a growing ability to provide access to contraception in these underserved areas through a more equitable distribution of health workers and/or a redefinition of which cadres are legally able and trained to provide various family planning methods. On the other hand, observed declines in CPR in urban areas in the CPR-stagnant countries, which are relatively urban, may be an indication of national-level challenges in ensuring access to contraception, neglect of certain urban populations through unequal distribution of health workers, and/or an inability of the urban health workforce to keep pace with rapid rates of urbanization.

Table 1. Short-Acting Method Use and Long-Acting and Permanent Method Use by Country[1]								
CPR-Improved Countries	**Short-Acting Method Use[2]** (% of Currently Married Women)				**Long-Acting and Permanent Method Use[3]** (% of Currently Married Women)			
	DHS 1	DHS 2	DHS 3	% Point Change in SAM use (DHS3-DHS1)	DHS 1	DHS 2	DHS 3	% Point Change in LAPM use (DHS3-DHS1)
Ethiopia	5.9	13.4	23.1	17.2	0.4	0.6	4.2	3.8
Madagascar	7.9	16.2	26.0	18.1	1.9	2.0	3.1	1.2
Malawi	21.1	21.8	30.8	9.7	5.0	6.4	11.4	6.4
Rwanda	4.7	8.8	36.8	32.1	1.0	1.0	7.6	6.6
Zambia	11.8	23	30.5	18.7	2.4	2.4	2.4	0
CPR-Stagnant Countries								
Benin	2.5	5.8	4.6	2.1	0.9	1.4	1.4	0.5
Ghana	11.1	14.9	13.7	2.6	2.1	3.8	2.7	0.6
Mali	3.8	5.2	6.3	2.5	0.7	0.6	0.5	-0.2
Nigeria	6.2	7.1	8.3	2.1	2.4	0.9	1.4	-1
Senegal	5.8	8.7	10.1	4.3	2.3	1.6	1.9	-0.4

[1]Data source: ICF International 2012. Ethiopia: DHS1=2000; DHS2=2005; DHS3=2011 Prelim; Madagascar: DHS1=1997; DHS2=2003-2004; DHS3=2008-2009; Malawi: DHS1=2000; DHS2=2004; DHS3=2010; Rwanda: DHS1=2000; DHS2=2005; DHS3=2010 Prelim; Zambia: DHS1=1996; DHS2=2001-2002; DHS3=2007; Benin: DHS1=1996; DHS2=2001; DHS3=2006; Ghana: DHS1=1998; DHS2=2003; DHS3=2008; Mali: DHS1=1995-1996; DHS2=2001; DHS3=2006; Nigeria: DHS1=1999; DHS2=2003; DHS3=2008; Senegal: DHS1=1997; DHS2=2005; DHS3= 2010-2011
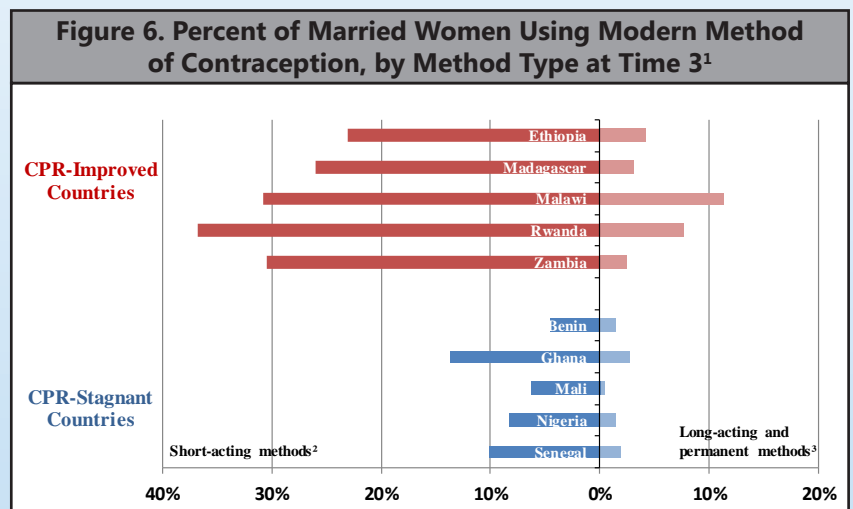
[2]Short-acting methods include injectables, pills, condom, diaphragm, foam, jelly, and lactational amenorrhea method (LAM).

[3]Long-acting and permanent methods include IUD, implants, male sterilization, and female sterilization.

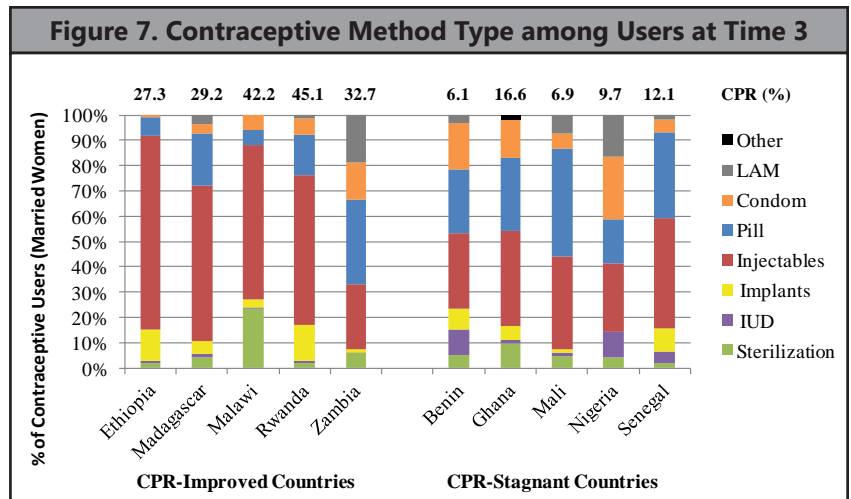Note: Respondents who reported using an "other modern method" were excluded.

Contraceptive method type: Short-acting methods (injectables, pills, condoms, diaphragm, foam, jelly, and lactational amenorrhea method [LAM]) are by far the most commonly used methods in both CPR-improved and CPR-stagnant countries at time 3 (Table 1 and Figure 6). Injectable contraception is the most common method of contraception in eight out of the 10 countries, whereas the pill is the most common method of contraception in Mali and Zambia (Figure 7). Injectable contraception is the method of choice for 50% of all users in four out of the five CPR-improved countries. None of the CPR-stagnant countries has any method that makes up more than 50% of users, and married women in CPR-stagnant countries use injectable contraception less frequently (27%–43% of users) than do those in CPR-improved countries. Also of note, the method mix is more varied in the CPR-stagnant countries, with higher proportions of users adopting methods such as pills, condoms, and LAM that traditionally require fewer highly skilled providers or no provider at all.

Long-acting and permanent methods (LAPM) include male and female sterilization, IUDs, and implants. Administration of LAPM typically requires access to more highly skilled health workers, such as doctors, nurses, or midwives. Steady increases in urban and rural LAPM use are

Figure 6. Percent of Married Women Using Modern Method of Contraception, by Method Type at Time 3[1]

[1]Data source: ICF International 2012.
[2]Short-acting methods include injectables, pills, condom, diaphragm, foam, jelly, and lactational amenorrhea method.
[3]Long-acting and permanent methods include IUD, implants, male sterilization, and female sterilization.

observed in several of the CPR-improved countries, except for Madagascar and Zambia, which experienced only slight changes in LAPM use over the 10–15 year period (Table 1). At time point 1 (1995–2000), the percentage of married women reporting use of an LAPM in Ethiopia, Malawi, and Rwanda was 0.4%, 5%, and 1% respectively. Over the next 10–15 years, use had risen to 4.2%, 11.4%, and 7.6% respectively. On the other hand, use of LAPM at the most recent time point is less than 3% among married women in all five of the CPR-stagnant countries. In fact, several of the CPR-stagnant countries show declines in LAPM use over the 10–15 year time period, especially in urban areas. For example, 2.3% of married women in Senegal reported use of a LAPM in 1997 but only 1.9% did so in 2011.
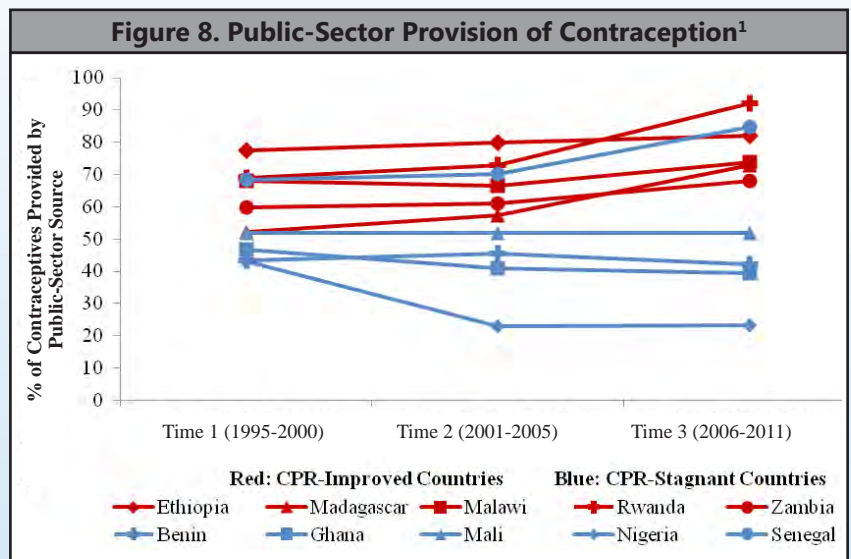

Figure 7. Contraceptive Method Type among Users at Time 3

[1]Data source: ICF International 2012.

• *Health workforce determinants at play?* Ensuring that populations have equitable access to a range of contraceptive methods requires that barriers related to which cadres can provide family planning methods be reduced by redefining legal scopes of practices, and that health workers who are then legally able to provide different types of contraception are appropriately trained, distributed, and retained throughout the country according to population needs. Since the type of health worker needed to provide contraception varies by method, the differentials in contraceptive use by method between countries may reflect, in part, differentials in access to specific cadres of trained health workers, especially in rural and underserved periurban areas. Use of certain types of methods may also partly reflect differences in health worker training, qualifications, and preferences, even within a given cadre.

Provision of contraception: Public versus private sector: One of the key challenges in efforts to assess health workforce access as a determinant of contraceptive use is the range of cadres that can potentially provide different contraceptive methods and the variation between countries in this regard. In the absence of specific information in the DHS on the type of provider by method choice, we explored variation in method source (public versus private sector).

Public- and private-sector provision of contraception varies by country and by method; however, this analysis revealed a notable distinction between the CPR-improved and CPR-stagnant countries (Figure 8). Ten to fifteen years ago, all of the CPR-improved countries had higher levels of public-sector provision than the CPR-stagnant countries, with the exception of Senegal. In addition, the CPR-improved countries all experienced an increase in public-sector provision relative to the private sector in the observed time period. By contrast, other than Senegal, the CPR-stagnant countries experienced declining or stable proportions of public-sector provision of contraception.

Figure 8. Public-Sector Provision of Contraception[1]

[1]Data source: ICF International 2012.
Note: Includes all modern methods except lactational amenorrhea method.

Furthermore, we identified differences in the type of private-sector source between the two groups. Specifically, the proportion of private-sector provision of contraception that is from a pharmacy is much higher among CPR-stagnant countries than CPR-improved countries, whereas the major private-sector sources among the CPR-improved countries are largely medical facilities such as hospitals and clinics and/or nongovernmental organizations. Additionally, the CPR-stagnant countries have higher proportions of contraceptive provision via shops, vendors, and friends/family (data not shown).

• *Health workforce determinants at play?* Relatively high levels of public-sector provision may be an indication of political will and favorable government support for developing a strong health workforce that is able to generate demand for, as

well as expand and improve access to, a diverse mix of contraceptive methods. Additionally, differences in the type of private-sector source may be a result of method preference, as well as availability and affordability of certain methods, and the level of health personnel required to provide the various methods.

Conclusion

In the late 1990s, 10 sub-Saharan African health workforce crisis countries had similar modern method CPRs among married women. Although the 10 countries currently share comparable Health Workers Reach Index scores at the national level, five of the countries emerged as family planning success stories over the following 10–15 year time period, while five made no or only scant improvements in the CPR. Acknowledging that there are many important factors besides health worker access that determine levels of contraceptive use, this exploratory analysis nonetheless raises questions about whether government commitment and certain policy choices vis-à-vis health workforce distribution and qualifications—*even when absolute levels of health worker density are low*—could make a difference in the provision of family planning services in resource-constrained countries.

In July 2012, global leaders—including the UK Government, the Bill & Melinda Gates Foundation, and the United Nations Population Fund, among others—came together and committed in partnership "[...] to support the rights of an additional 120 million women and girls in the world's poorest countries to use contraceptive information, services and supplies, without coercion or discrimination, by 2020" (Family Planning 2020 n.d.). Increased political commitment to and investment in the health workforce—numbers, types, distribution, qualifications, and support—will be needed to achieve this unassailable goal.

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Appendix: Health Outcomes of 10 Sub-Saharan African Countries

CPR-Improved Countries (% Urban)[2]		Contraceptive Use among Married Women (%)[1]				DPT3 Coverage (%)[1]				Deliveries Assisted by Skilled Birth Attendant (%)[1]			
		DHS 1	DHS 2	DHS 3	% Point Change in CPR (DHS3-DHS1)	DHS 1	DHS 2	DHS 3	% Point Change in DPT3 (DHS3-DHS1)	DHS 1	DHS 2	DHS 3	% Point Change in SBA (DHS3-DHS1)
Ethiopia (17%)	Total	6.3	13.9	27.3	21	20.8	31.9	36.5	15.7	5.6	5.7	10.8	5.2
	Urban	28.3	42.2	49.5	21.2	51.3	65.7	60.5	9.2	34.5	44.6	51.6	17.1
	Rural	3.3	10.6	22.5	19.2	17.2	29.0	32.5	15.3	2.3	2.6	4.8	2.5
Madagascar (31%)	Total	9.7	18.3	29.2	19.5	48.4	61.4	72.8	24.4	47.3	45.3	43.9	-3.4
	Urban	17.6	26.5	35.6	18.0	59.2	80.0	88.7	29.5	68.3	70.6	81.6	13.3
	Rural	7.1	15.9	28.0	20.9	45.5	57.4	70.9	25.4	42.1	39.6	39.3	-2.8
Malawi (14%)	Total	26.1	28.1	42.2	16.1	84.2	81.5	93.0	8.8	55.6	56.1	71.4	15.8
	Urban	38.2	34.7	49.6	11.4	92.4	89.8	94.1	1.7	81.6	83.1	84.0	2.4
	Rural	24.1	26.9	40.7	16.6	82.8	80.3	92.8	10.0	51.9	52.0	69.2	17.3
Rwanda (19%)	Total	5.7	10.3	45.1	39.4	86.0	87.0	96.8	10.8	31.3	38.6	69.0	37.7
	Urban	16.1	21.2	47.0	30.9	86.5	84.9	95.7	9.2	68.2	63.1	82.4	14.2
	Rural	3.9	8.6	44.9	41.0	85.9	87.3	97.0	11.1	24.9	34.6	67.2	42.3
Zambia (36%)	Total	14.4	25.3	32.7	18.3	85.7	80.0	79.7	-6.0	46.5	43.3	46.5	0
	Urban	23.6	41.2	42.0	18.4	90.2	87.9	89.4	-0.8	76.9	79.0	83.0	6.1
	Rural	8.2	16.6	27.6	19.4	82.7	76.8	76.1	-6.6	26.4	27.6	31.3	4.9
Benin (43%)	Total	3.4	7.2	6.1	2.7	66.9	72.5	67.0	0.1	64.0	72.9	77.7	13.7
	Urban	5.8	9.8	9.0	3.2	69.3	80.1	76.8	7.5	79.9	83.0	85.6	5.7
	Rural	2.1	5.8	4.5	2.4	65.8	68.4	61.7	-4.1	56.5	68.4	73.5	17.0
Ghana (52%)	Total	13.3	18.7	16.6	3.3	72.2	79.5	88.8	16.6	44.3	47.1	58.7	14.4
	Urban	17.4	24.2	18.6	1.2	83.7	86.2	87.2	3.5	76.3	79.7	84.3	8.0
	Rural	11.4	14.9	15.1	3.7	67.7	75.8	89.8	22.1	34.1	30.9	43.0	8.9
Mali (33%)	Total	4.5	5.7	6.9	2.4	37.5	39.6	67.6	30.1	38.7	40.6	49.0	10.3
	Urban	11.6	14.7	13.0	1.4	64.1	68.4	75.8	11.7	79.0	83.7	80.0	1.0
	Rural	1.9	2.8	4.2	2.3	28.0	30.1	64.3	36.3	24.8	27.8	37.6	12.8
Nigeria (51%)	Total	8.6	8.2	9.7	1.1	26.3	21.4	35.4	9.1	41.6	35.2	38.9	-2.7
	Urban	15.7	13.9	16.7	1.0	44.7	40.2	54.8	10.1	57.9	58.5	65.4	7.5
	Rural	5.6	5.7	6.5	0.9	19.6	12.8	27.0	7.4	35.3	25.7	27.7	-7.6
Senegal (43%)	Total	8.1	10.3	12.1	4.0	N/A	78.3	82.6	N/A	46.6	51.9	65.2	18.6
	Urban	19.3	18.0	20.2	0.9	N/A	79.6	83.6	N/A	80.9	84.6	90.7	9.8
	Rural	2.1	5.0	6.5	4.4	N/A	77.5	81.9	N/A	29.6	33.2	49.1	19.5

[1]Data source: ICF International 2012.
Ethiopia: DHS1=2000; DHS2=2005; DHS3=2011 Prelim; Madagascar: DHS1=1997; DHS2=2003-2004; DHS3=2008-2009; Malawi: DHS1=2000; DHS2=2004; DHS3=2010; Rwanda: DHS1=2000; DHS2=2005; DHS3=2010 Prelim; Zambia: DHS1=1996; DHS2=2001-2002; DHS3=2007; Benin: DHS1=1996; DHS2=2001; DHS3=2006; Ghana: DHS1=1998; DHS2=2003; DHS3=2008; Mali: DHS1=1995-1996; DHS2=2001; DHS3=2006; Nigeria: DHS1=1999; DHS2=2003; DHS3=2008; Senegal: DHS1=1997; DHS2=2005; DHS3=2010-2011
[2]Data source: Population Reference Bureau 2011.

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