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Family Planning Commodities Requirement in Achieving Replacement-Level Fertility in Ethiopia

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Abstract- Ensuring the availability of modern contraceptive methods both by type and quantity is crucial in the provision of quality primary health care and designing appropriate intervention strategies toward reducing maternal and child mortality. This endeavor therefore, is designed to make family planning commodities requirement projection based on various assumptions with the target of achieving replacement level fertility by 2020 and also estimate costs of family planning commodities. Baseline data were obtained from 2007 census reports, 2011 EDHS and model data for Ethiopian context. The SPECTRUM by using FamPlan model was used to project these outcomes, with analysis restricted to the time period 2011–2020. Spectrum and MS Excel were used to analyze and producing report for this study. The projection result of the study showed that the 2011 CPR of 29% will therefore need to increase to 71% to attain the replacement-level fertility of 2 by 2020. In order to reduce fertility rate, users of contraceptives should also increase accordingly.

Keywords: family planning, commodities, replacement-level fertility, ethiopia.

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Keywords: family planning, commodities, replacement-level fertility, ethiopia.

I. Introduction

Ensuring the availability of modern contraceptive methods both by type and quantity is crucial in the provision of quality primary health care and designing appropriate intervention strategies toward reducing maternal and child mortality (Beta consulting and development firm and UNFPA, 2010).

The opportunity of deciding freely the number, spacing and timing of children is a basic human right with proven positive health effects, particularly for women and children, demographic and overall socio-economic benefits. Meeting unmet need for contraception prevents estimated 30% of maternal deaths, 20% child mortality and 36 million years of healthy life lost each year globally (Kennedy et al., 2013). Moreover, reducing unmet need for contraception prevents other adverse consequences. It is evident that access to family planning commodities contributes to universal education, women's empowerment, HIV prevention, poverty reduction and environmental sustainability; thus, it is one of the most cost-effective health and development interventions. To date, there has been little evidence exists regarding family planning commodities requirement including their potential cost (Stover et al., 2010).

Effective and efficient reproductive health programs depend on a reliable supply of essential commodities. However, lack of evidence has contributed to inadequate prioritization and funding for family planning methods and slow progress towards universal access to reproductive health interventions (Kennedy et al., 2013), particularly family planning services. Evidence-based understanding of family planning commodities requirement assists in planning services prioritization and funding.

In Ethiopia, a 50% funding gap was pointed as a predicament against the government's ambition of ensuring commodity security (London summit, 2012). Hence, projections for family planning requirements can help set realistic goals, plan for the service expansion required to meet program objectives and evaluate alternative methods of achieving goals (Stover et al., 2010). This endeavor therefore, is designed to make family planning commodities projection based on various assumptions with the target of achieving replacement-level fertility by 2020.

II. Materials and Methods

Ideally, quantification for projection is an activity that includes constant monitoring of inventory levels, product consumption rates and other information—including programmatic and environmental factors—that may affect future demand. If the logistics management information system (LMIS) is designed well and kept up-to-date, the staff responsible for quantification and procurement will have with them all the consumption and stock level information they need. While

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consumption data is considered as the gold standard for contraceptive projection, such data are not always accurate, reliable or readily available ((NIPORT, 2010).

As a result, using a FamPlan model, scenario was set to reduce totality fertility rate from 4.8 (EDHS, 2011) children per a woman reproductive age to 2.0 (Zelalem B and Gizachew A, 2014) by 2020.

Baseline data were obtained from 2007 census reports, 2011 Ethiopian Demographic and Health Survey, previous projection using the FamPlan model (Zelalem B and Gizachew A, 2014) and model data for Ethiopia context.

Primary outcomes of the projection included contraceptive prevalence rate, number of users and acceptors per methods, commodity requirement and associated costs. The SPECTRUM was used to project these outcomes, with analysis restricted to the time period 2011–2020. Spectrum and MS Excel were used to analyze and producing report for this study.

III. Results and Discussion

The total fertility rate for Ethiopian women was 4.8 in 2011 (EDHS, 2011). The total TFR is projected to attain replacement-level fertility, i.e., two children per women in 2020 (Figure 1).

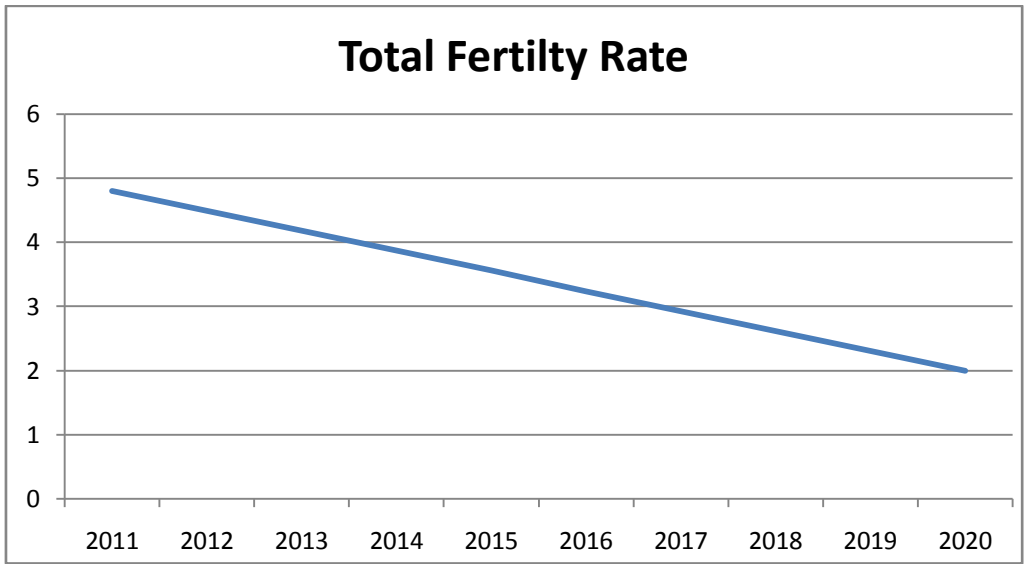

Figure 1: Projected total fertility rate, 2011-2020

a) Contraceptive prevalence rate

The turn down of fertility is accompanied by an increase in the use of family planning methods which is manifested by the contraceptive prevalence rate (CPR). While other factors like increase at the age of marriage, postpartum insusceptibility and sterility can affect fertility, it is unlikely that further reductions in fertility can be achieved unless there are also supplementary progress in Contraceptive use. Accordingly, the 2011 CPR of 29% will therefore need to increase to 71% to attain the replacement-level fertility in 2020. Figure 2 shows the projection of CPR that would be necessary to achieve a TFR of 2 by 2020.

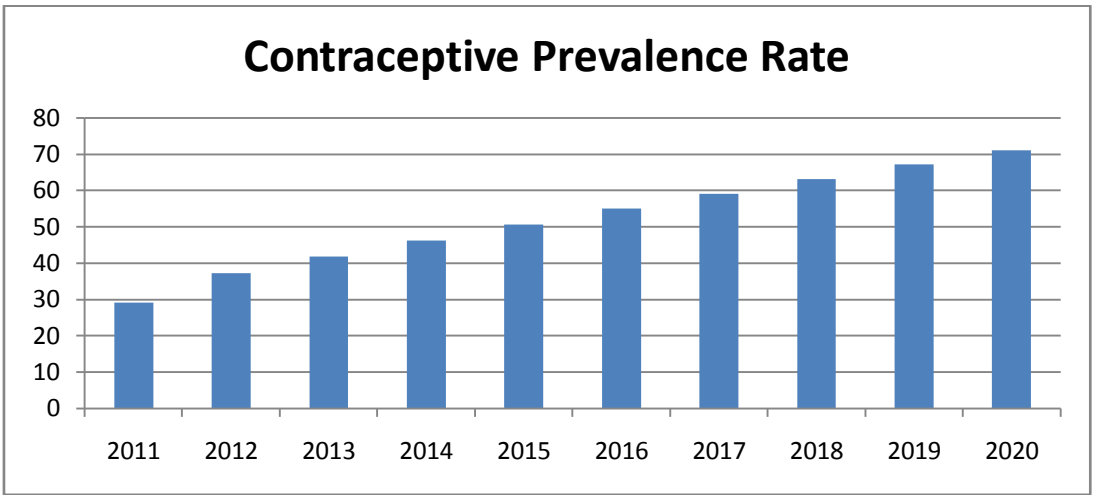

Figure 2: Trend of contraceptive prevalence rate, 2011-2020.

b) Users of family planning commodities

The number of women of reproductive age who seek services will affect future service delivery requirements for family planning commodities. In order to reduce fertility rate, users of contraceptives should also increase accordingly. Based on this projection, about 11.5 million women of reproductive age group are expected to use family planning methods in 2020 (Figure 3).

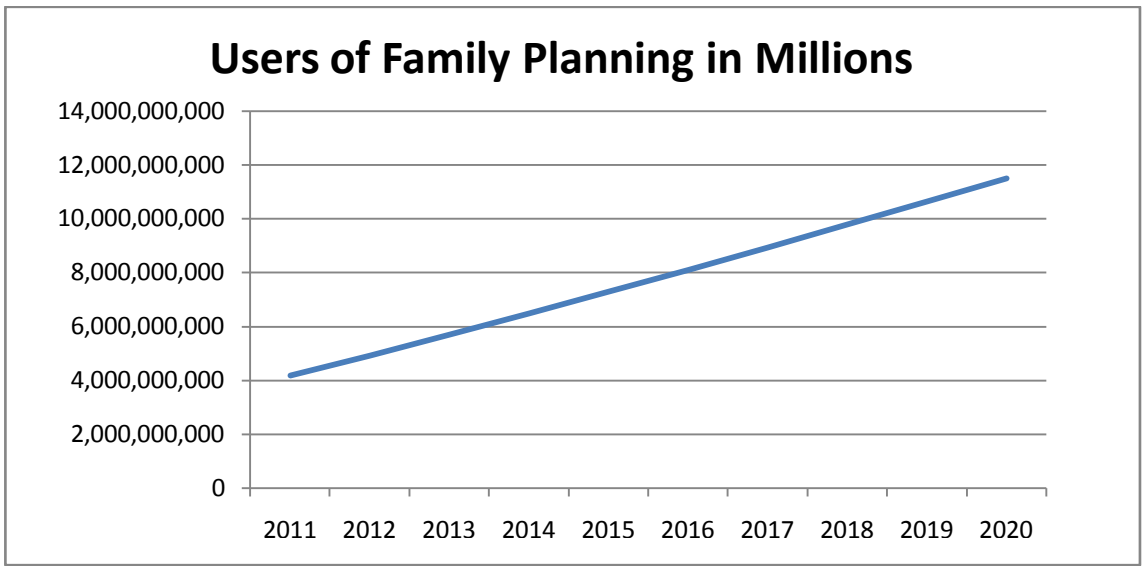

Figure 3: Users of family planning method, 2011-2020.

c) Acceptors of family planning

Expanding access to long-acting and permanent methods (LAPCMs) is a key to increasing women's contraceptive choice and addressing the high unmet need, and will contribute towards achievement of the FP2020 goals (Ngo TD, et al., 2013).

Therefore, the number of reproductive age women accepting long-acting and permanent family planning methods is estimated by this projection; accordingly, about 3 million more women accept family planning methods in 2020 (Figure 4).

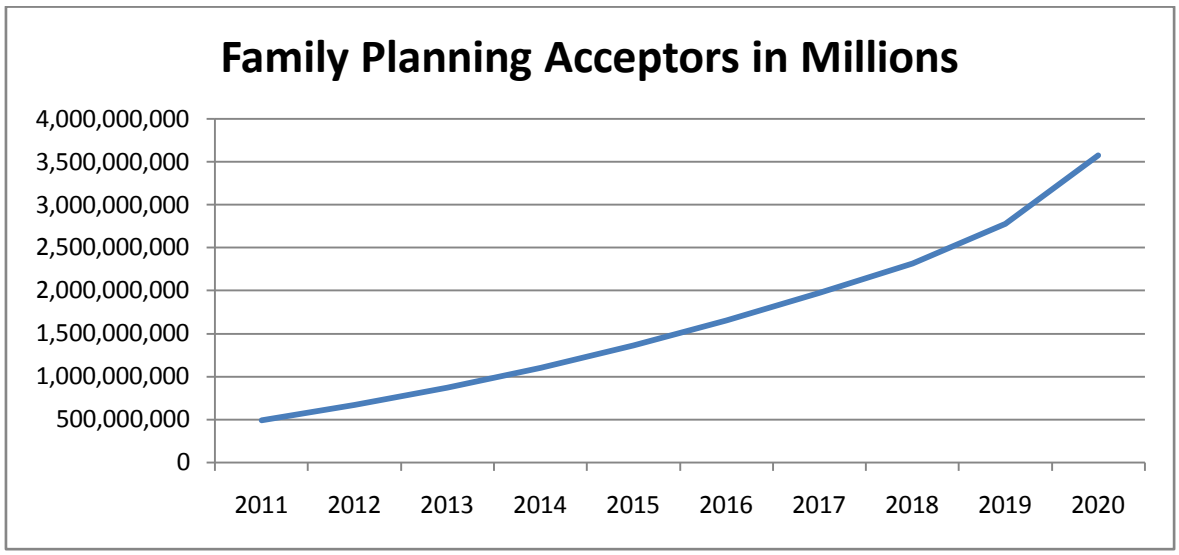

Figure 4: Family planning acceptors, 2011-2020.

d) Family planning methods requirement

To meet the growing needs of essential family planning service programs, contraceptives input is a must. This section presents the results of estimated future commodity requirements on the basis of the method-mix assumptions. Commodity requirements per user for condoms, pills, injectables, IUDs, implants, female sterilization are based on EDHS (2011) consumption per couple year of protection (CYP) assumptions.

Table 1 shows percentage distribution of users by method maintaining the base scenario of percentage distribution. The projection depicts the shift of methods from short-acting to long-acting family planning commodities (Table 1).

Table1: Distribution of family planning methods requirement by type, 2011-2020.

Distribution of methods by type						
Year	Condoms	Pills	Injectables	Implants	IUD	Female sterilization
2011	13.79	36.2	47.2	1.5	0.6	0.06
2012	14.2	35.7	47.4	1.8	0.79	0.06
2013	13.05	35.15	46.98	2.1	1.0	0.05
2014	15.25	34.52	46.47	2.45	1.24	0.048
2015	15.90	33.78	45.88	2.86	1.50	0.044
2016	16.67	32.93	45.20	3.33	1.81	0.041
2017	17.58	31.91	44.39	3.89	2.17	0.038
2018	18.68	30.68	43.41	4.56	2.60	0.036
2019	20.0	29.09	42.10	5.63	3.11	0.033
2020	21.46	26.83	40.07	7.60	3.98	0.034

e) Gross cost

Projection of the costs of family planning requires estimates of the costs of providing services to users including commodities costs. The model used for these projections employs a "cost per user" parameter from GAP analysis.

Accordingly, to reach the current objective of achieving replacement level fertility by 2020, the financial requirement for contraceptive commodities for Ethiopia is also estimated to increase from the current requirement. Consequently, there will be an increasing demand for contraceptives and an increasing requirement for government and donor funds for contraceptive procurement needs an additional ETB 42.7 billion from 2011 (Figure 5).

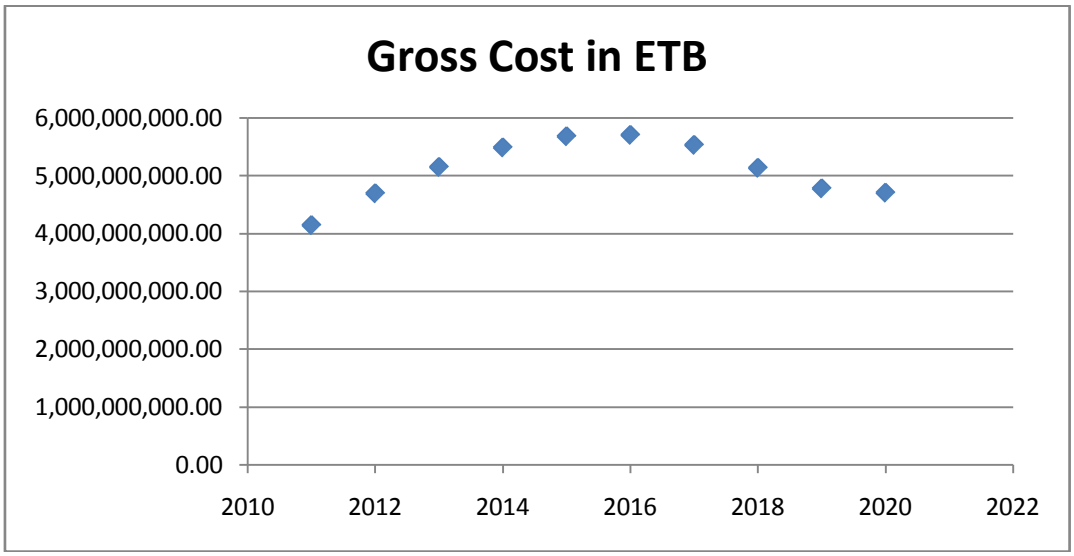

Figure 5: Gross cost of family planning commodities, 2011-2020.

IV. Conclusions and Recommendations

More family planning commodities are required to increase the current contraceptive prevalence rate of 29% (EDHS, 2011) to 71% in turn to achieving a replacement level-fertility by 2020. Hence, all stakeholders should do towards increasing access of family planning commodities in terms of both method mix and quality.

V. Acknowledgements

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Annex

Demographic Data for DemProj: Demographic data-FamPlan Commodity Requirement from 2011-2020

Note:

1. Almost all references mentioned under 'References' and 'Methods' sections above including census (2007) and EDHS (2011) were consulted during projection.
2. Interpolation and duplication were also used depending on the nature and purpose of input data.

Projection parameters
First year: 2011
Final year: 2020
Projection period: single year
Currency name: ETB
Urban/rural projection: Do not include urban/rural projection
Scale: Thousands
First year population (2011)

Age	Male	Female
0-4	6,034,500.1	5,933,000.0
5-9	5,820,880.0	5,756,160.1
10-14	5,515,680.0	5,473,900.3
15-19	4,944,479.9	4,925,539.9
20-24	4,117,860.1	4,125,400.0
25-29	3,296,740.0	3,338,719.9
30-34	2,673,300.1	2,697,080.1
35-39	2,229,860.0	2,224,640.0
40-44	1,841,400.0	1,858,600.0
45-49	1,491,680.0	1,546,500.0
50-54	1,179,960.0	1,260,240.0
55-59	945,380.0	1,034,340.0
60-64	772,940.0	846,840.0
65-69	575,480.0	645,300.0
70-74	382,680.0	446,600.0
75-79	220,360.0	269,960.0
80+	281,660.0	385,100.0
Total	42,324,840.3	42,767,920.3

TFR inputs for Family Planning Module

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
TFR	4.80	4.49	4.18	3.87	3.56	3.24	2.93	2.62	2.31	2.00

Age distribution of Fertility (%)

Age	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
15-19	6.78	6.45	6.16	5.91	5.65	5.39	5.13	4.91	4.73	4.55
20-24	21.83	21.93	22.01	22.07	22.14	22.20	22.27	22.33	22.39	22.45
25-29	29.11	29.88	30.57	31.18	31.78	32.39	33.00	33.52	33.96	34.40
30-34	22.40	22.52	22.63	22.73	22.84	22.94	23.05	23.13	23.19	23.25
35-39	12.41	12.13	11.89	11.69	11.49	11.30	11.10	10.92	10.76	10.60
40-44	5.49	5.23	5.00	4.80	4.60	4.40	4.20	4.03	3.89	3.75
45-49	1.98	1.86	1.74	1.62	1.50	1.38	1.26	1.16	1.08	1.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Birth ratio (male births per 100 female birth)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Birth Ratio	105.00	105.00	105.00	105.00	105.00	105.00	105.00	105.00	105.00	105.00

Life expectancy

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male	56.5	57.0	57.6	58.1	58.7	59.2	59.8	60.3	60.9	61.4
Female	60.0	60.4	60.9	61.3	61.8	62.2	62.7	63.1	63.6	64.0

Model life table

Coale Demeny North: IMR=72.7

Total Net Migrants

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FamPlan Input Data: Summary of inputs

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Method attributes										
Condoms/CYP	120	120	120	120	120	120	120	120	120	120
Female Ster. average age	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Injections/CYP	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
IUD duration of use (yrs)	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Implant duration of use (yrs)	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Pill cycles/CYP	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Effectiveness										
Condom	81	81	81	81	81	81	81	81	81	81
Female sterilization	100	100	100	100	100	100	100	100	100	100
Injectable	100	100	100	100	100	100	100	100	100	100
IUD	96	96	96	96	96	96	96	96	96	96
Implant	100	100	100	100	100	100	100	100	100	100
Pill	92	92	92	92	92	92	92	92	92	92
Traditional	50	50	50	50	50	50	50	50	50	50
Method Mix										
Condom	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5
Female sterilization	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0
Injectable	72.7	67.8	62.8	57.8	52.9	47.9	42.9	37.9	33.0	28.0
IUD	1.1	3.7	6.4	9.0	11.7	14.4	17.0	19.7	22.3	25.0
Implant	11.9	15.1	18.4	21.6	24.8	28.1	31.3	34.5	37.8	41.0
Pill	7.3	6.8	6.3	5.7	5.2	4.7	4.1	3.6	3.0	2.5
Traditional	4.5	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.3	2.0
Source Mix										
Condom										
Public	17.3	18.7	20.1	21.5	22.9	24.4	25.8	27.2	28.6	30.0
Private	82.7	81.3	79.9	78.5	77.1	75.6	74.2	72.8	71.4	70.0
Female sterilization										
Public	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
Private	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Injectable										
Public	85.2	84.6	84.0	83.5	82.9	82.3	81.7	81.2	80.6	80.0
Private	14.8	15.4	16.0	16.5	17.1	17.7	18.3	18.8	19.4	20.0
IUD										
Public	64.9	67.7	70.5	73.3	76.1	78.8	81.6	84.4	87.2	90.0
Private	35.1	32.3	29.5	26.7	23.9	21.2	18.4	15.6	12.8	10.0
Implant										
Public	10.0	18.9	27.8	36.7	45.6	54.4	63.3	72.2	81.1	90.0
Private	90.0	81.1	72.2	63.3	54.4	45.6	36.7	27.8	18.9	10.0
Pill										
Public	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Private	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Traditional										
Public	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Private	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Cost										
Condom										
Public	20.80	19.58	18.65	17.92	17.33	16.85	16.44	16.10	15.80	15.54
Private	89.80	84.54	80.53	77.38	74.84	72.74	70.99	69.49	68.21	67.09
Female sterilization										
Public	5.00	4.71	4.48	4.31	4.17	4.05	3.95	3.87	3.80	3.74
Private	596.40	561.44	534.84	513.92	497.03	483.12	471.46	461.55	453.02	445.60
Injectable										
Public	9.00	8.47	8.07	7.76	7.50	7.29	7.11	6.96	6.84	6.72
Private	42.60	40.10	38.20	36.71	35.50	34.51	33.68	32.97	32.36	31.83
IUD										
Public	4.00	3.77	3.59	3.45	3.33	3.24	3.16	3.10	3.04	2.99
Private	73.80	69.47	66.18	63.59	61.50	59.78	58.34	57.11	56.06	55.14
Implant										
Public	5.20	4.90	4.66	4.48	4.33	4.21	4.11	4.02	3.95	3.89
Private	73.80	69.47	66.18	63.59	61.50	59.78	58.34	57.11	56.06	55.14
Pill										
Public	20.80	19.58	18.65	17.92	17.33	16.85	16.44	16.10	15.80	15.54
Private	51.00	48.01	45.74	43.95	42.50	41.31	40.32	39.47	38.74	38.10
Traditional										
Public	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fees										
Condom										
Public	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Private	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Female sterilization										
Public	20.39	20.39	20.39	20.39	20.39	20.39	20.39	20.39	20.39	20.39
Private	20.39	20.39	20.39	20.39	20.39	20.39	20.39	20.39	20.39	20.39
Injectable										
Public	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Private	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
IUD										
Public	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Private	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Implant										
Public	24.64	24.64	24.64	24.64	24.64	24.64	24.64	24.64	24.64	24.64
Private	24.64	24.64	24.64	24.64	24.64	24.64	24.64	24.64	24.64	24.64
Pill										
Public	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Private	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Traditional										
Public	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Private	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proximate det.										
Percent of women 15-49 in union	62.0	61.8	61.6	61.3	61.1	60.9	60.7	60.4	60.2	60.0
Postpartum Insusceptibility (months)	16.7	16.5	16.3	16.1	15.9	15.8	15.6	15.4	15.2	15.0
Unintended preg. terminated/induced abortion (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sterility (%)	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.5
Reaching a goal for total fertility rate										
Prevalence (%)	29.0									
Total fertility rate	4.8	4.5	4.2	3.9	3.6	3.2	2.9	2.6	2.3	2.0