

# Reproductive Health Interventions

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## Description of condition and intervention

Reproductive health (RH) interventions are a cluster of interventions, typically provided at different levels of all health systems, with impact on aspects of human reproduction. For now, RH interventions in FairChoices: DCP Analytic Tool focus only fertility impact and not the full array of consequences from RH interventions. The aim of the modelling is to assess the demographic impact in various populations by scaling-up these services as part of Essential Health Care Packages in low- and low-middle-income countries. Table 1 provides an overview of all RH interventions included in the FairChoices tool. [This evidence brief covers modern contraception \(RH01-RH03\) and key parameters needed in the FairChoices demographic model.](#)

Table 1: Overview of reproductive health interventions in FairChoices: DCP Analytic Tool

<b>RH01</b>	<b>Provision of condoms and hormonal contraceptives (incl. emergency contraceptives)</b>				
RH01-01		Combined oral contraceptive pill			
RH01-02		Pill - Progestin only			
RH01-03		Pill - Peri-coital contraception (PCC)			
RH01-04		Condom			
RH01-05		Emergency contraceptives			
<b>RH02</b>	<b>Insertion and removal of modern long-lasting contraceptives, of client choice</b>				
RH02-01		Injectable - 3 month (Depo Provera)			
RH02-02		Injectable - 2 month (Noristerat)			
RH02-03		Injectable - 1 month (Lunelle)			
RH02-04		Injectable - 6 month			
RH02-05		Injectable - Uniject			
RH02-06		IUD - Copper-T 380-A IUD (10 years)			
RH02-07		IUD - LNG-IUS (5 years)			
RH02-08		Implant - Implanon NXT (3 years)			
RH02-09		Implant - Jadelle (5 years)			
RH02-10		Implant - Sino-Implant (4 years)			
<b>RH03</b>	<b>Permanent contraception</b>				
RH03-01		Vasectomy			
RH03-02		Tubal ligation			
<b>RH04</b>	<b>Family planning (antenatal and postpartum)</b>				
<b>RH05</b>	<b>Safe abortion</b>				

RH05-01		Removal of retained products following miscarriage, incomplete abortion or conception			
RH05-02		Management of post abortion complications (sepsis, lacerations)			
RH05-03		Induced abortion			
RH05-03-01			Medical abortion		
RH05-03-02			Surgical abortion		
<b>RH06</b>	<b>Identification and management of infertility</b>				

### Contraceptive interventions, mechanisms of action:

Method	How it works
<b>Combined oral contraceptives (COCs) or “the pill”</b>	Prevents the release of eggs from the ovaries (ovulation)
<b>Progestogen-only pills (POPs) or “the minipill”</b>	Thickens cervical mucous to block sperm and egg from meeting and prevents ovulation
<b>Implants</b>	Thickens cervical mucous to blocks sperm and egg from meeting and prevents ovulation
<b>Progestogen only injectables</b>	Thickens cervical mucous to block sperm and egg from meeting and prevents ovulation
<b>Monthly injectables or combined injectable contraceptives (CIC)</b>	Prevents the release of eggs from the ovaries (ovulation)
<b>Combined contraceptive patch and combined contraceptive vaginal ring (CVR)</b>	Prevents the release of eggs from the ovaries (ovulation)
<b>Intrauterine device (IUD): copper containing</b>	Copper component damages sperm and prevents it from meeting the egg
<b>Intrauterine device (IUD) levonorgestrel</b>	Thickens cervical mucous to block sperm and egg from meeting
<b>External (male) condoms</b>	Forms a barrier to prevent sperm and egg from meeting
<b>Internal (female) condoms</b>	Forms a barrier to prevent sperm and egg from meeting
<b>Vasectomy (male sterilization)</b>	Keeps sperm out of ejaculated semen
<b>Tubal ligation (female sterilization)</b>	Eggs are blocked from meeting sperm
<b>Emergency contraception pills (ulipristal acetate 30 mg or levonorgestrel 1.5 mg)</b>	Prevents or delays the release of eggs from the ovaries. Pills taken to prevent pregnancy up to 5 days after unprotected sex

Source: <https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception>

## International guidelines

Organization	Guidelines for contraceptive use	Applicability
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		in LIC & Lower MIC settings
WHO	Medical eligibility criteria for contraceptive use	✓
	Selected practice recommendations for contraceptive use	✓

## Intervention attributes

### Type of interventions

Fertility reduction

### Delivery platform

Primary care outpatient setting is the main delivery platform for all RH interventions, for example at health centre and hospital level. However, other RH interventions will also be included, but at smaller scale.

Community workers or health post: Provision of condoms and hormonal contraceptives.

Primary health center: Tubal ligation, vasectomy, and insertion and removal of long-lasting contraceptives.

### Equity

All RH interventions strengthens women rights and their right to free choice with all consequences following from these.

### Time dependence

Low level of urgency, meaning no harmful effects of delaying start-up of contraceptives for a couple of weeks.

### Population in need of interventions

Women and girls of reproductive age (15-54 years) who want to avoid pregnancy.

### Coverage

**Contraceptive prevalence, all modern methods (mCPR):** Percentage of all women of reproductive age who are using a modern contraceptive method. Assumption about contraceptive prevalence, all modern methods: Low-income countries: 23.9 % (22.4 – 25.5); and Lower-middle-income countries: 35.5 % (32.2-38.9) (Source: [Kantorová et al \(2020\)](#)).

**Total demand for family planning:** Defined as the proportion of women of reproductive age who want to avoid pregnancy.

**Demand for family planning met by modern methods (coverage):** mCPR/total demand for family planning.

Assumption about baseline coverage of contraceptives in FairChoices: Low-income countries: 54%; and Lower-middle-income countries: 70% (Source: [Sully EA et al \(2020\)](#)).

## Intervention effect

Modern contraceptives have low failure rates with perfect use of the contraceptive. However, inconsistent or incorrect use gives higher typical use failure rates, especially for short-acting contraceptives. Pregnancy rates during typical use show how effective a contraceptive method is during actual use, including inconsistent and incorrect use.

For the comparison pregnancy rate for women not using contraceptives, a commonly used estimate is based on couples attempting to get pregnant after discontinuing contraceptive use, where 85% experience a pregnancy within one year. However, this estimate is not representative of all women who have an unmet need of contraception, with varying levels of sexual activity and fecundity. In the Guttmacher Institute's analysis "Adding it up: Investing in Sexual and Reproductive health 2019", an estimated pregnancy rate of 40 % is used for women wanting to avoid pregnancy who are not using a contraceptive method. This is likely to be a more realistic estimate for a general population with couples wishing to avoid a pregnancy, but who are not currently using a contraceptive method.

Sources: Riley et al., Askew et al.

Table 1: Effect of modern contraceptives

Contraceptive method	Women experiencing an unintended pregnancy within the first year of use (%) <i>Typical use</i>		Transferability of evidence
No method	40 <sup>1</sup>		
<b>Provisions of condoms and hormonal contraceptives</b>			
Pill	6.3 (5.9-6.8) <sup>2</sup>		
Condom	8.6 (7.6-9.6) <sup>2</sup>		
Other hormonal methods	6.3 (5.9-6.8) <sup>3</sup>		
<b>Insertion and removal of modern long-lasting contraceptives, of client choice</b>			
Injectable	2 (1.7-2.3) <sup>2</sup>		
IUD	1.2 (0.9-1.5) <sup>2</sup>		
Implants	0.3 (0.1-0.9) <sup>2</sup>		
<b>Permanent contraception</b>			
Female sterilization	0.5 <sup>4</sup>		
Vasectomy	0.15 <sup>4</sup>		

1 Riley T et al. Estimated pregnancy rate for non-users at risk of unintended pregnancy from Adding it up 2019

2 Bradley et. al (2019) estimated contraceptive failure rates based on self-reported data from 15 reliable DHS surveys from a range of low- and middle-income countries

3 Other hormonal method includes patch/ring and emergency contraceptive pills. We use the pill use-failure rate from Bradley et al., similarly to the Adding it up 2019 analysis.

4 Trussell 2011

## Model assumptions

Table 2: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Category	Model parameter	Notes
Treated population Gender Age	Women 15-49 years old	
Affected Population	Women 15-49 years old who want to avoid pregnancy	
Intervention	Contraceptive method	
Comparison	No intervention	
Incidence reduction (pregnancies)*		1 – failure rate (effectiveness <u>not</u> compared to pregnancy rates of women who do not use contraception: (this is what we use as input in FairChoices)
Pill and other hormonal methods	0.937	
Injectable	0.98	
IUD	0.988	
Implants	0.997	
Female sterilization	0.995	

Category	Model parameter	Notes
Treated population Gender Age	Men  Provision of condoms: 15-99 years old  Vasectomy: 25 years onwards	
Affected Population	Women 15-54 years old who want to avoid pregnancy	
Intervention	Contraceptive method	
Comparison	No intervention	
Incidence reduction (pregnancies) *		1 – failure rate (effectiveness <u>not</u> compared to pregnancy rates of women who do not use contraception:
Condom	0.79	0.914
Vasectomy	0.99	0.9985

\*Equal to fertility reduction under the assumption that the proportions of unintended pregnancies ending in live births, abortions, miscarriages and stillbirths remain constant

## Contraception and total fertility rate

Several studies have shown a strong linear relationship between the contraceptive prevalence rate (CPR) and the total fertility rate (TFR). Tsui et al. (2001) found that an increase of 15 percentage points in CPR among married women reduces TFR by 1 birth per woman. Regression line:  $y = -0.07x + 7.29$  where a 1 percentage point increase in CPR correlates to a 0.07 decline in TFR.

Cleland et al. (2012) estimate that a rise of about 17 percentage points reduces fertility by one birth per woman, and that the level of contraceptive use among women of reproductive age accounts for 74% of the variation in national fertility rates.

$$\text{TFR} = -0.0597x + 6.695$$

According to Bongaarts (2017), the total fertility rate is typically around 6-7 births per woman with no contraceptive use, while fertility is near two births per woman in countries where the CPR for women in union is around 75%. However, the relationship between CPR and TFR has not followed this pattern in several countries where the CPR has increased, but the TFR has declined at a slower pace than expected, especially in Sub-Saharan Africa. Choi et al. (2018) examined whether the association between CPR and TFR has changed over time in LMICs. They found that a decrease in TFR of 1 was associated with a CPR increase of 15.4 percentage points in the time-period 1985-2000, and 17.2 during 2001-2016, and with a 20 percentage point increase in sub-Saharan Africa.

## Intervention Cost

Lince-Deroche et al. annualized contraceptive method unit costs to reflect couple-years of protection (CYP) through multiplying the unit costs by a conversion factor which represents the number of units required for one year of contraceptive protection:

Intervention	Cost components in US\$			Average direct cost in US\$ (A+B+C)
	Drug & supplies (A)	Contraceptive commodities (B)	Personnel (C)	
Female sterilization	0.49	0	1.62	2.11
Male sterilization	0.15	0	1	1.15
IUD	0.18	0.09	0.65	0.92
Implant	0.18	3.24	2.66	6.08
Injectable	0.57	4.58	5.14	10.29
Pill	0	5.09	4.12	9.21
Patch/ring	0	5.09	4.12	9.21
Emergency contraceptive pills	0	5.55	4.12	9.67
Male condom	0	2.53	3.37	5.9

\* The cost is assumed to be equivalent to annual costs for male condom usage due to a lack of data on the costs of other supply methods in most low- and middle-income countries.

Source: Lince-Deroche et al. (2020). Supplementary table 2 (modified, the original table has information for different regions).

# References

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## Appendix

### Supplementary details for intervention effect calculations

Incidence reduction (pregnancies)*	Relative risk of becoming pregnant with intervention
Pill and other hormonal methods	0.84
Injectable	0.95
IUD	0.97
Implants	0.99
Female sterilization	0.99



# Appendix

## Literature Review for effectiveness & safety

Level 1: intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention). This is the «quick and dirty» approach.

Level 2: structured, non-systematic review of literature and guidelines. A scoping process that involves searching certain high-yield databases in a time-limited manner.