

# DEMOGRAPHY AND FAMILY PLANNING



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

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# DEMOGRAPHY

- ▶ The scientific study of human populations, including their sizes, compositions, distributions, densities, growth, and other characteristics, as well as the causes and consequences of changes in these factors.

# DEMOGRAPHY

- ▶ It focuses on three readily observable human phenomena:
  - Changes in population size (**growth or decline**)
  - **Composition** of the population and,
  - **Distribution** of the population.
  
- ▶ It deals with five demographic processes: **fertility, mortality, marriage, migration and social mobility.**

# Demographic cycle

## ▶ Stage I: High Stationary

- Characterized by High birthrate and high death rate which cancel each other and population remains stationary. E.g. India till 1920.

## ▶ Stage II: Early Expanding

- Death rate begins to decline but birth rate remains unchanged as the result of improvement of health condition. E.g. many South Asian and African country currently.

# Demographic cycle

## ▶ Stage III: Late Expanding

- Death rate declines still further and the birth rate tends to fall resulting continuous growth of population. E.g. India has entered in this phase and China & Singapore are already in this phase.

## ▶ Stage IV: Low stationary

- Characterized by low birth rate and low death rate resulting stationary population (Zero growth rate). E.g. Austria during 1980–85, UK, Denmark, Sweden 1980–85 GR: ,0.1)



# Demographic cycle

## ▶ Stage V: Declining

- Population becomes to decline because **birth rate is lower than the death rate**. E.g. Germany and Hungary.



# Growth Rate

- ▶ The number of **persons added to** (or subtracted from) a **population in a year due to natural increase and net migration** expressed as a percentage of the population at the beginning of the time period.

Rating	Annual rate of growth %	Population doubling time in years
Stationary pop	No growth	---
Slow growth	<0.5	>139
Moderate growth	0.5–1.0	139–70
Rapid growth	1.0–1.5	70–47
Very rapid growth	1.5–2.0	47–35
Explosive growth >2	2.0–2.5	35–28
	2.5–3.0	28–23
	3.0–3.5	23–20
	3.5–4.0	20–18

# World population trends

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**TABLE 4.1**

## World Population Growth and Doubling Times

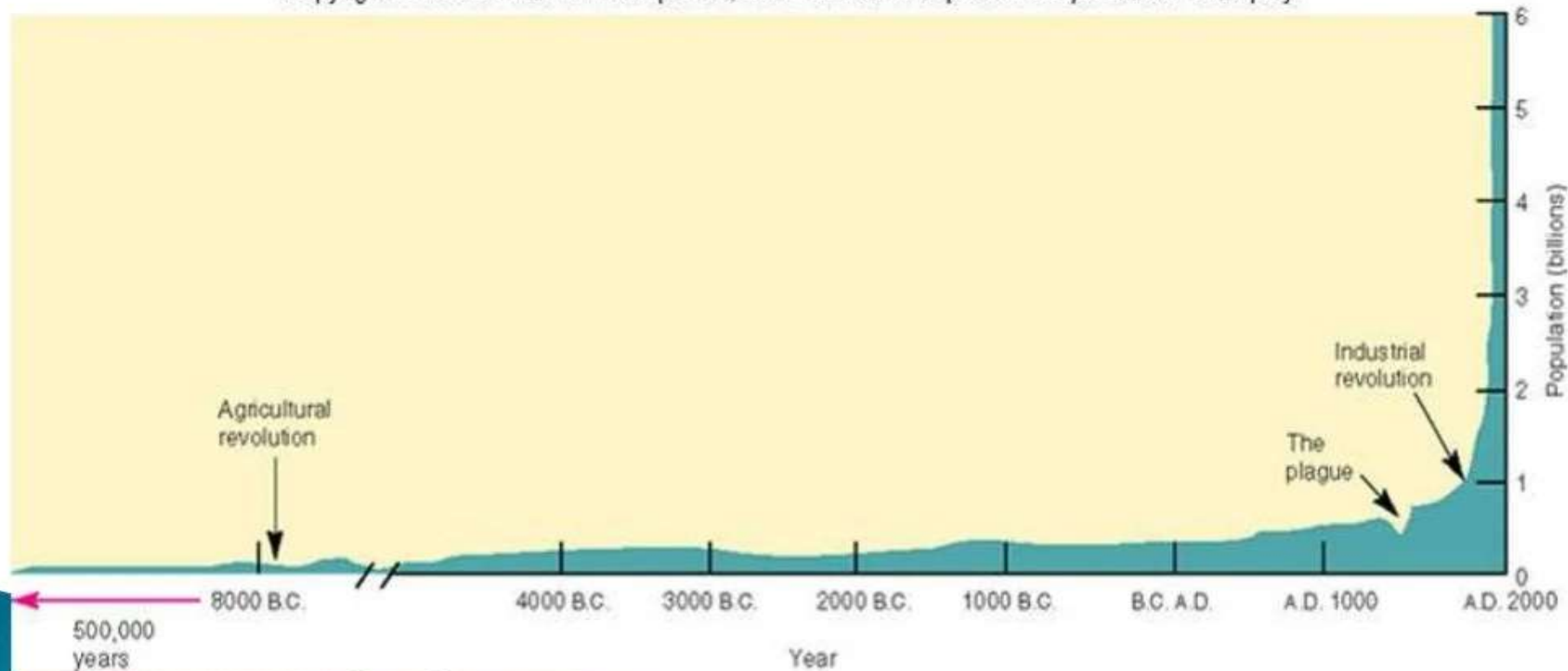
<b>Date</b>	<b>Population</b>	<b>Doubling Time</b>
5000 B.C.	50 million	?
800 B.C.	100 million	4,200 years
200 B.C.	200 million	600 years
A.D. 1200	400 million	1,400 years
A.D. 1700	800 million	500 years
A.D. 1900	1,600 million	200 years
A.D. 1965	3,200 million	65 years
A.D. 2000	6,100 million	51 years
A.D. 2050 (estimate)	8,920 million	215 years

Source: United Nations Population Division.



# World population trends

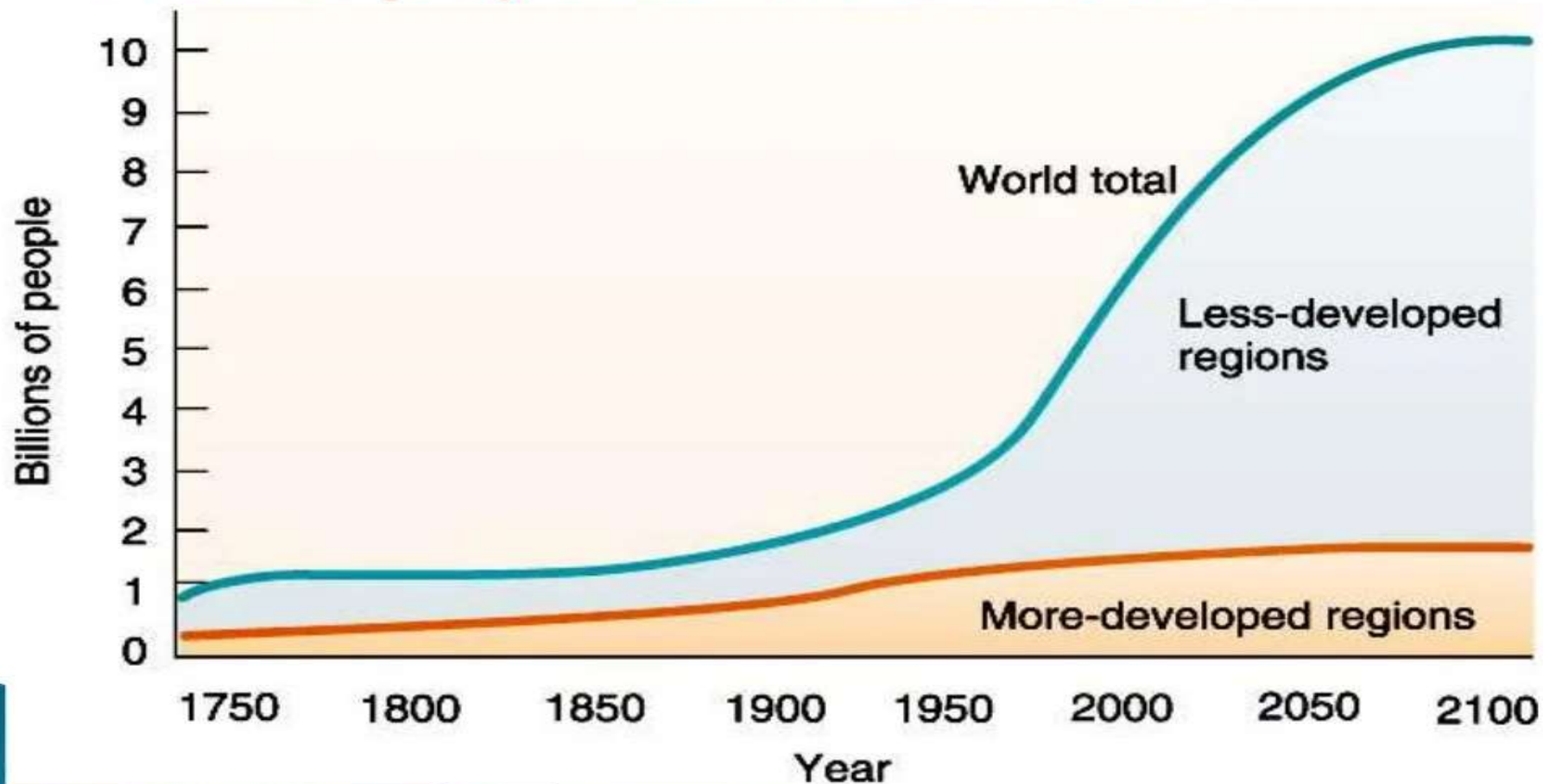
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# World population trends

Year	Population (million)	Average annual growth rate in %
1750	791	--
1800	978	0.4
1850	1262	0.5
1900	1650	0.6
1950	2526	1.1
1960	3037	1.79
1970	3696	1.92
1975	4066	1.89
1980	4432	1.72
1987	5000	1.63
1991	5385	1.7
1998	5884	1.6
2000	6054	1.4
2003	6313	1.1
2008	6737	1.3

# World population trends



# World population trends

- ▶ Up to 1800 AD: 1 billion
- ▶ Around 1930: 2 billion 130 years
- ▶ Around 1960: 3 billion 30years
- ▶ In 1974: 4 billion 15years
- ▶ In 1987: 5 billion 12years
- ▶ In 1999: 6 billion 12 years
- ▶ In 2025: 8 billion 26 years



**TABLE 4.2**

**The World's Largest Countries**

2005		2050	
Country	Population (millions)	Country	Population (millions)
China	1,304	India	1,628
India	1,104	China	1,437
United States	297	United States	420
Indonesia	222	Indonesia	308
Brazil	184	Pakistan	295
Pakistan	162	Brazil	260
Bangladesh	144	Nigeria	258
Russia	143	Bangladesh	231
Nigeria	132	Congo, Dem. Rep. of	183
Japan	128	Ethiopia	170

Source: Data from Population Reference Bureau, 2005.

By 2050, India will probably be the world's most populous country.

# Silent features of population growth

- ▶ Approximately 95% population growth is occurring in developing countries.
- ▶ Currently 1/3<sup>rd</sup> of world's population is <15; when they reached to reproductive age growth rate will further increases.
- ▶ UNFPA estimates world's population will be 10 billion by 2050 and 20.7 billion by 2100.
- ▶ Fertility rate for developed, developing and least developed country is 1.6, 12.9 and 4.9 per woman respectively.
- ▶ World's population has been growing at 176 people/minute, 10564/hour, 253542/day and 92543000 /year.

# Family Planning

- ▶ The conscious effort of couples to regulate the number and spacing of births through artificial and natural methods of contraception. Family planning connotes conception control to avoid pregnancy and abortion, but it also includes efforts of couples to induce pregnancy.



# Family Planning

- ▶ An expert committee of the WHO (1971) defined Family Planning as “a way of thinking & living that is adopted voluntarily, upon the basis of knowledge, attitude & responsible decisions by individual & couples, in order to promote the health & welfare of the family group & this contribute effectively to the social development of a country.”



## **Family planning helps individuals or couples to attain certain objectives:**

- ▶ To avoid **unwanted births**
- ▶ To bring about **wanted births**
- ▶ To regulate the **intervals between pregnancies**
- ▶ To control the time at which birth occurs in relation to the **age of the parent**
- ▶ To determine the **number of children in the family.**

# Scope of Family Planning

1. The proper spacing and limitation of birth
2. Advice on sterility
3. Education for parenthood
4. Sex education
5. Screening for pathological conditions of RH
6. Genetic counseling
7. Premarital consultation and examination
8. Carrying out pregnancy test
9. Marriage counseling
10. Preparation of couple for the arrival of their 1<sup>st</sup> child
11. Providing service to unmarried mothers
12. Teaching home economics and nutrition
13. Providing adoption services

# Benefit of family planning

- ▶ FP is the one of the most effective and inexpensive way of improving the present and future quality of life on earth.
- ▶ FP could save the life of  $1/4^{\text{th}}$  –  $1/2$  of 5,00,000 maternal deaths.
- ▶ Also prevent the damage caused by high risk and undesired pregnancies.
- ▶ Could prevent most or all 50,000 illegal abortion/day and resulting 1,50,000 death/year.




# Benefit of family planning

- ▶ Decrease the physical and mental exhaustion resulting from large family and poorly time pregnancy.
- ▶ Women would have more time for: education, vocational development, income production, recreation and care of existing children.
- ▶ Save millions of infant lives per year by reducing the number of high risk births.
- ▶ Lead to significant improvement in infants nutrition and health.

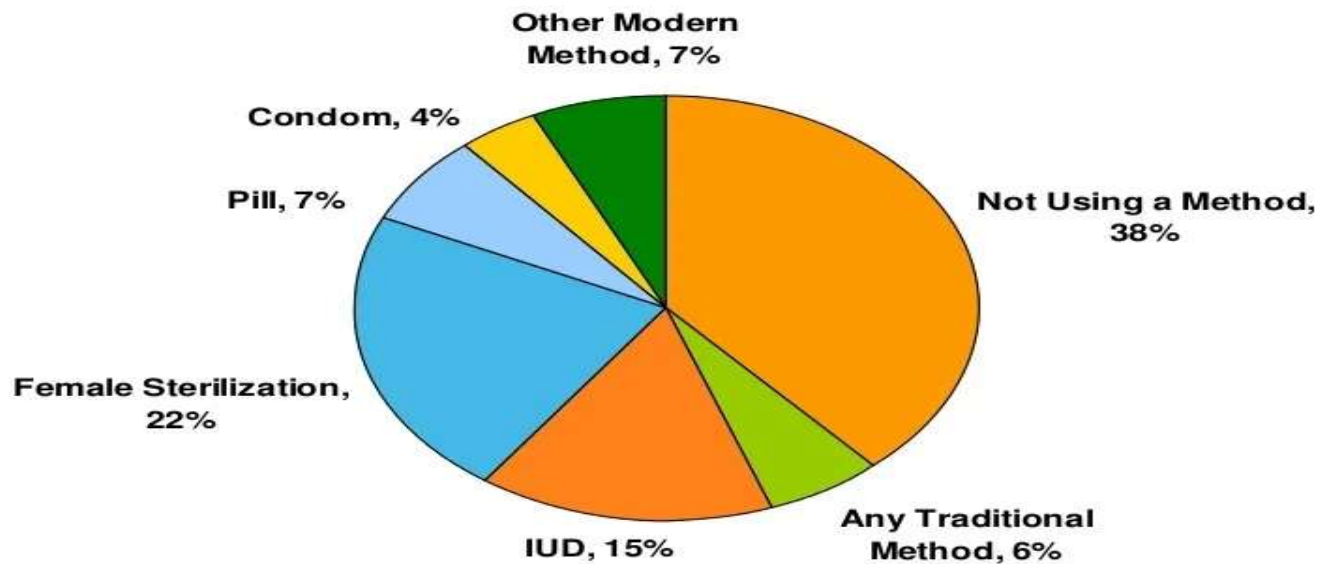


# Benefit of family planning

- ▶ Decrease the number of **teenage pregnancies**
  - ▶ Decrease the incidence of **cervical cancer**
  - ▶ Decrease the incidence of **sexually transmitted diseases.**
- 

# Family Planning Methods in Developing Countries, 2007

Married Women of Reproductive Age Using Family Planning



Source: United Nations Population Division, *World Contraceptive Use, 2009*.

# Contraceptives methods

- ▶ Contraceptive methods are preventive methods to help women avoid unwanted pregnancies including all temporary and permanent measures to prevent pregnancy resulting from coitus.

# Contraceptives methods

## 1. Spacing methods

- i. Barrier method: Physical, Chemical, combined
- ii. Intrauterine devices
- iii. Hormonal methods
- iv. Post-conceptual methods
- v. Miscellaneous

## 2. Terminal methods

- i. Male sterilization
- ii. Female sterilization

## 3. Hormone Based Contraceptives



# 1. Barrier method

- ▶ Include both physical and chemical barriers.
  - Condoms (male & female)
  - Cervical barriers (diaphragm & cervical cap)
  - Spermicidal (foam, sponge)
- ▶ Work by preventing sperm from reaching an ovum.
- ▶ Only condoms provide protection against STIs.



# Male Condom



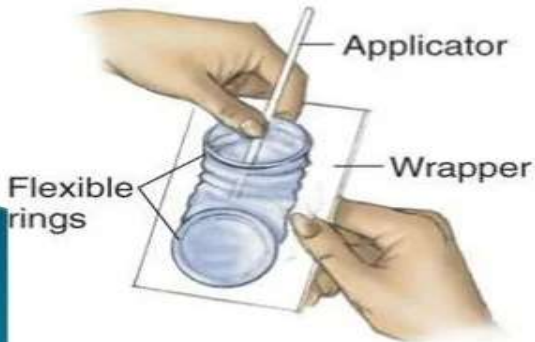
- ▶ Sheath that fits over the erect penis
- ▶ The only temporary method of birth control for men
- ▶ Only form of contraception that effectively reduces STI transmission
- ▶ Made of thin latex, polyurethane, or natural membrane



# Female condom



- ▶ Consists of **two flexible polyurethane rings** and a soft, loose-fitting polyurethane sheath
  - One ring at closed end fits loosely against **cervix**;  
other ring at open end encircles the **labial area**
- ▶ **Can be inserted several hours before** sexual activity; don't need to remove it immediately following ejaculation.



# Female Condoms





# Advantages and disadvantages

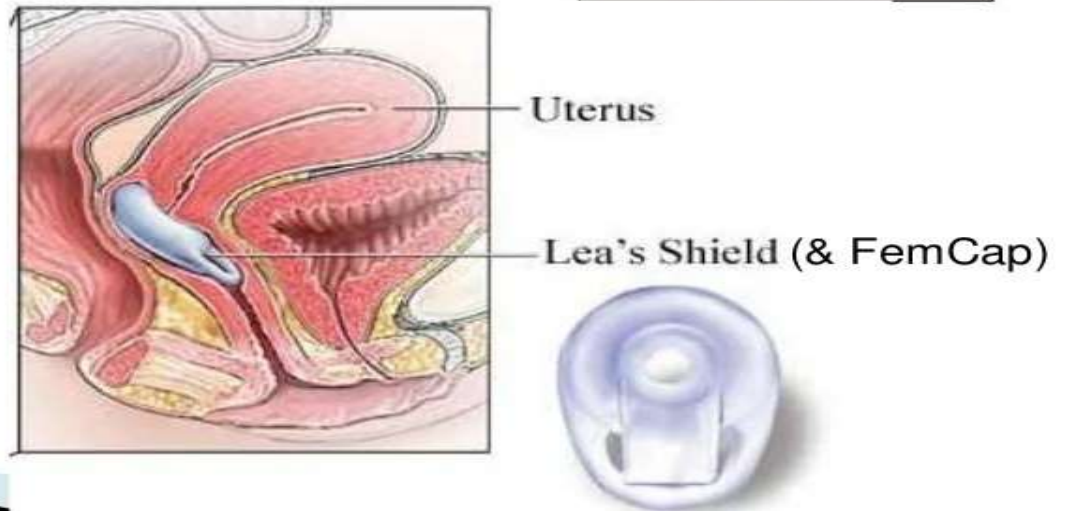
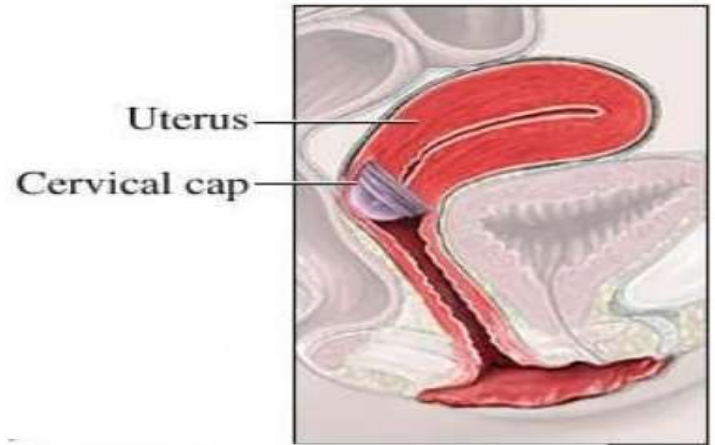
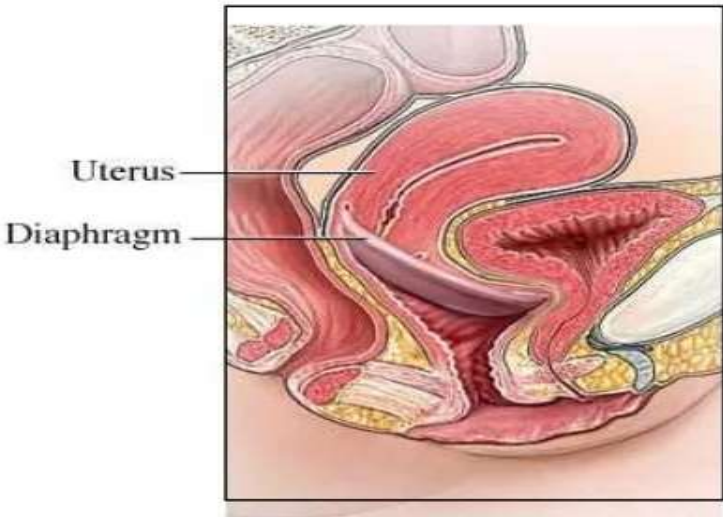
Advantages	Disadvantages
<ul style="list-style-type: none"><li>▪ Easily Available</li><li>▪ Inexpensive</li><li>▪ Easy to use</li><li>▪ No side effective</li><li>▪ Disposable</li><li>▪ STI protection</li></ul>	<ul style="list-style-type: none"><li>▪ Can reduce sensation<ul style="list-style-type: none"><li>▪ Polyurethane transmits heat well, so some say that the female condom has less reduction in sensation</li></ul></li><li>▪ Interruption of sexual experience</li><li>▪ May slip off or tear out during coitus</li></ul>

# Cervical barrier devices

- ▶ Covering the cervix is one of the oldest methods in contraceptive history.
- ▶ **Cervical cap**: covers cervix only
- ▶ **Diaphragm**: covers upper vaginal wall behind cervix underneath pubic bone
- ▶ **Fem-cap & Lea's shield** have removal straps
- ▶ **Lea's Shield** allows a one-way flow of fluid from cervix to vagina
- ▶ Method is usually combined with spermicidal



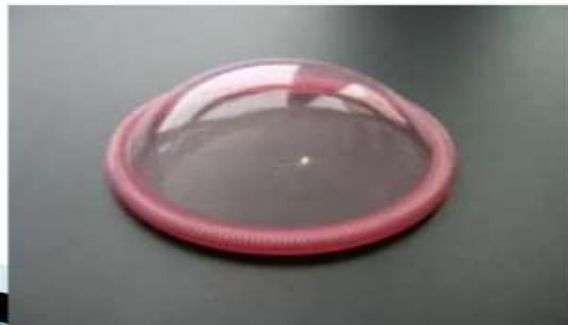
# Placement of cervical barrier devices





# Advantages and Disadvantages

- ▶ **Advantages:** absence the risk of pregnancy and medical contraindication.
- ▶ **Disadvantages:** initially need trained health person to demonstrate the technique; may cause toxic shock syndrome if left in vagina for several hours.





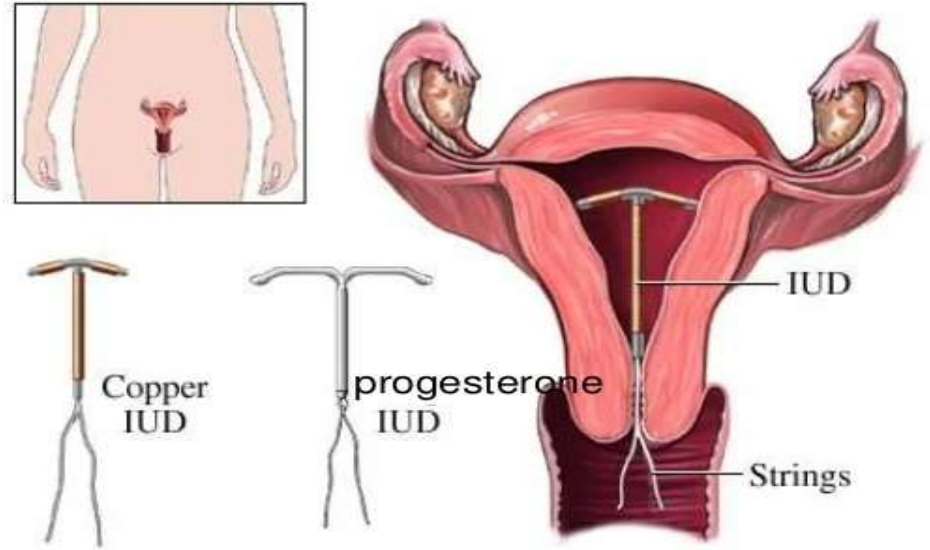
# Vaginal spermicides

- ▶ **Include:** foam, sponge, suppositories, creams, film
- ▶ **Spermicidal:** chemical that kills sperm (nonoxynol-9)
- ▶ **Advantage:** no prescription necessary
- ▶ **Disadvantages:**
  - **Interruption of sexual experience** (except for the sponge)
  - **Skin irritation** (which can increase susceptibility to STI infection)
  - **No protection from STIs**
  - **Not effective enough to be used with other a condom or other method**

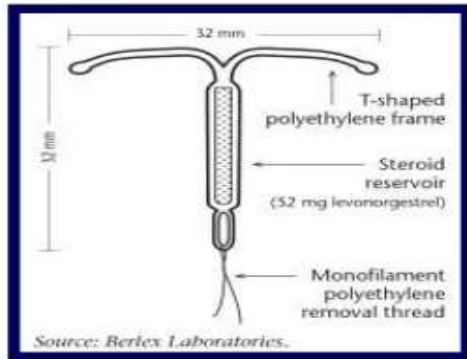


## 2. Intrauterine Devices (IUDs)

- ▶ Small plastic objects inserted into uterus.
- ▶ **2 types**
  - Hormone-releasing (progesterone)
  - Copper-releasing
- ▶ Have fine **plastic threads** attached that hang slightly out of cervix into vagina for removal.



# IUD Mechanisms of Action



## Levonorgestrel-Releasing IUD (LNG-IUS, Mirena®)

- Inhibits fertilization
- Thickens cervical mucous
- Inhibits sperm function
- Thins and suppresses the endometrium

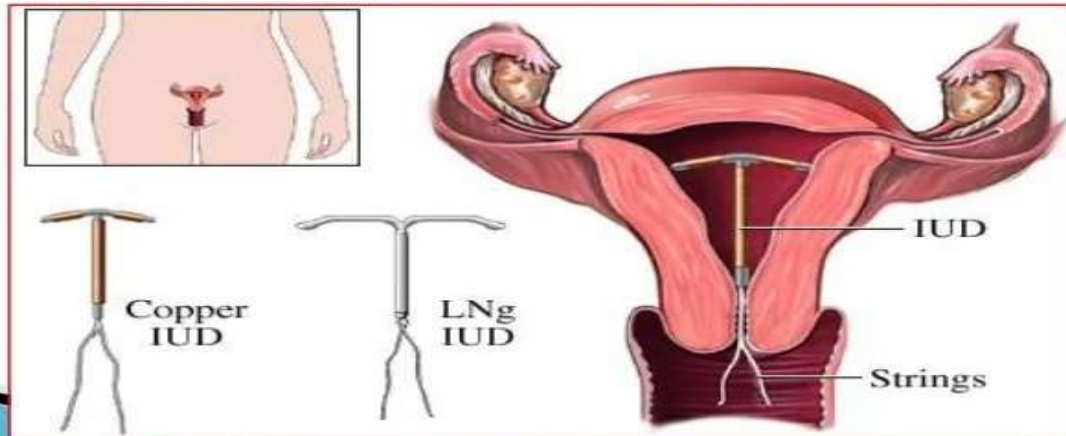
## Copper-Releasing IUD (ParaGard® T380A)

- Inhibits fertilization
- Releases copper ions ( $\text{Cu}^{2+}$ ) that reduce sperm motility
- May disrupt the normal division of oocytes and the formation of fertilizable ova



# Intrauterine Devices (IUDs)

- ▶ Very high continuation rate compared with other methods
- ▶ Duration
  - Copper: good for up to 10 years
  - Hormone: good for up to 5 years





# Intrauterine Devices

- ▶ Bleeding and Pain
- ▶ Pelvic infection: 2–8 times higher than normal
- ▶ Uterine perforation: 1;150 to 1: 9000 insertion
- ▶ Ectopic pregnancy: 0.2/10000
- ▶ Expulsion: 12–20%
- ▶ Cancer and teratogenicity
- ▶ Mortality : 1 /100000 women – years of use
- ▶ Suspected pregnancy
- ▶ Undiagnosed vaginal bleeding
- ▶ Ca cervix, uterus
- ▶ Previous ectopic pregnancy
- ▶ Anaemia
- ▶ PIDs
- ▶ Congenital malformation of Reproductive organs

Side effects

Contraindication

# Advantages and Disadvantages

## ▶ Advantages

- Very effective (essentially no “user error”)
- Long-term protection
- No interruption of sexual activity
- Don't have to remember to use
- Can be used during breast-feeding

## ▶ Disadvantages

- No STI protection
- Risk of PID (usually within first 1–2 months following insertion)
- Rare incidence of perforating uterine wall

# 3. Hormone-based contraceptives

two types hormone based contraceptives

1) Oral contraceptives Pills (OCPs)

- 1) Combined pills
- 2) Progesterone only pill (POP)
- 3) Once a month (long acting pill)
- 4) Male pill

2) Depot (slow release) formulations

- 1) Injected hormones
- 2) Vaginal ring
- 3) Transdermal patch
- 4) Hormonal IUDs



# Oral contraceptives Pills (OCPs)

## ▶ Combined pill

- Contains both **estrogen and progestin**
- At present most of combined pills contain **30–35 mcg of synthetic estrogen and 0.5–1.0 mg of progesterone.**
- Given daily for **21 consecutive days** beginning on the fifth day of the menstrual cycle, followed by 7 days breaking during which period menstruation occurs.

## ▶ Progestin-only pill

- Low dose of progestin and **no estrogen**
- For women who should not take estrogen (breastfeeding, high blood pressure, at risk for blood clots, smoke)

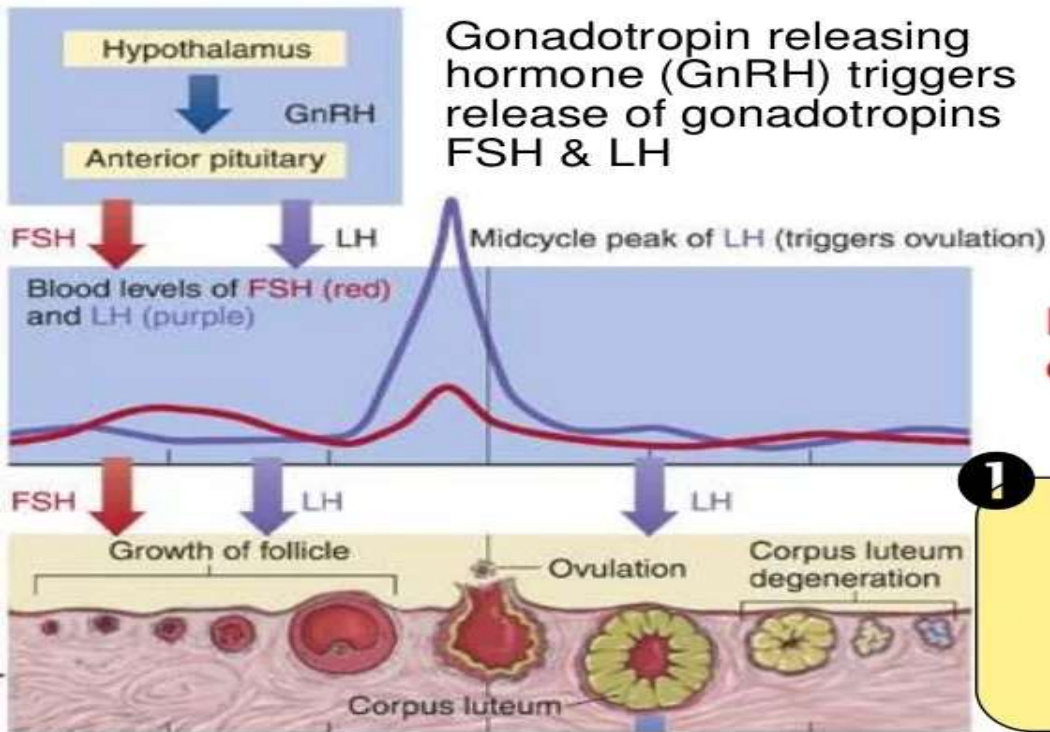


# Oral contraceptives Pills (OCPs)

- ▶ **Once a month pill**
  - Contains **quinestrol**, a long acting estrogen is given in combination with a short acting progesterone.
  - High pregnancy rate and also high irregular bleeding.
- ▶ **Male pill**
  - Preventing **spermatogenesis**
  - Interfering sperm storage and maturation
  - Preventing sperm transport to vas
  - Affecting constituents of the seminal fluids
  - **Under investigation**

# How hormonal contraceptives work?

Gonadotropin releasing hormone (GnRH) triggers release of gonadotropins FSH & LH



FSH & LH trigger ovulation

1

Estrogen & progesterone in hormonal contraceptives inhibit LH, FSH, and GnRH secretion, preventing ovulation

2

Progesterone also:

- thickens cervical mucus to prevent Passage of sperm into the uterus
- changes uterine lining to inhibit implantation

# How to use oral contraceptives

- ▶ Different types of OCPs will differ in how to begin, and other instructions: read instructions carefully & talk with health workers
- ▶ **Don't skip pills**, regardless of whether or not you are having sex
- ▶ Take pill at the **same time each day**
  - If you miss 1 pill: take missed pill as soon as you remember, and then take next pill at the regular time
  - If you miss > 1 pill: consult health care practitioner for advice; use a **backup method** for remainder of your cycle



# Possible side effects & health issues

- ▶ **Women who should not take OCs:**
  - History of blood clots, strokes, heart/circulation problems, jaundice, breast or uterine cancer, liver disease
  
- ▶ **Women considered risky for taking OCs:**
  - Women who smoke, have migraines, depression, high BP, epilepsy, diabetes, asthma, varicose veins



# Possible side effects & health issues

- ▶ Side effects of OCs can include:
  - Weight gain, decreased sexual interest, headaches, mood changes, nausea, bleeding between periods
  - May clear up after 2–3 cycles on the pill
- ▶ Rare side effect include carcinogenesis, metabolic disorder, liver disorders etc.

# Depot Formulations



## ▶ Injected Contraceptives

- DMPA or Depo-Provera contains 150mg/ml Depot medroxy-progestrone acetate.
- Dose: 150mg/ml every 3 weeks.
- Constraints: no STD protection, weight gain, bleeding, mood change, frequent clinic visits.
- Takes up to 10 months for a woman to get pregnant after stopping. injections



# Depot Formulations



- ▶ **Contraceptive Implants**
  - Also known as **Norplant**, 6 silicon capsule containing **35 mg levonorgestrol** each capsule.
  - Inserted under skin of upper arm
  - Progestin-only
  - Effective for up to **5–8 years**
  - No need to daily intake
  - No STD protection, weight gain, bleeding, mood change, need of surgical procedure



# Depot Formulations



- ▶ **Vaginal ring**
  - 2" ring inserted into the vagina during period
  - Containing levonorgestrel.
  - Worn for 3 weeks, removed for 1 week, then replaced with new ring
  - No STD protection, not effective for all women .



# Miscellaneous

## Abstinence

- This is the total avoidance of sexual activity.
- It carries a 0 (zero) percent chance of getting pregnant.
- The mystery of Aspirins
- Question arising to possibilities.

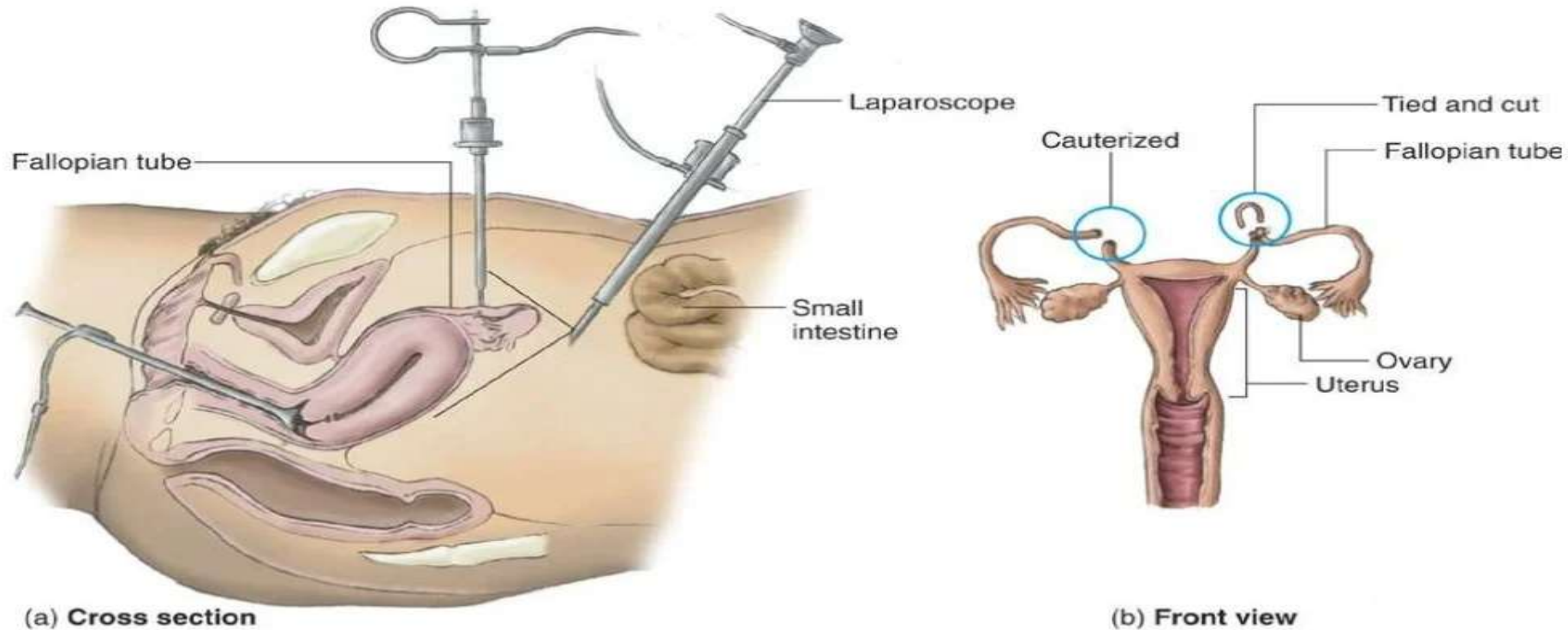
# Sterilization

- Essentially permanent, although vasectomies are sometimes reversible.
- Does not affect hormones, desire, sexual functioning.
- Only one time method in life.
- Provides most effective protection against pregnancy.
- Very low risk of complication if performed according to the accepted medical standards.
- Includes vasectomy and minilap and laparoscopy .

# Female sterilization

- ▶ Two procedure are most common: laparoscopy and minilaparatomy
- ▶ **Laparoscopy:** specialized instrument Laparoscope inserted through abdominal approach and fallopian tubes are blocked with clip or rings.
- ▶ **Minilap:** 2.5–3 cm incision in abdomen is done under local anesthesia and fallopian tubes cut and blocked in both sides.

# Female sterilization procedure



- ▶ **Laparoscope**: narrow, lighted viewing instrument that is inserted into abdomen to locate the fallopian tubes.



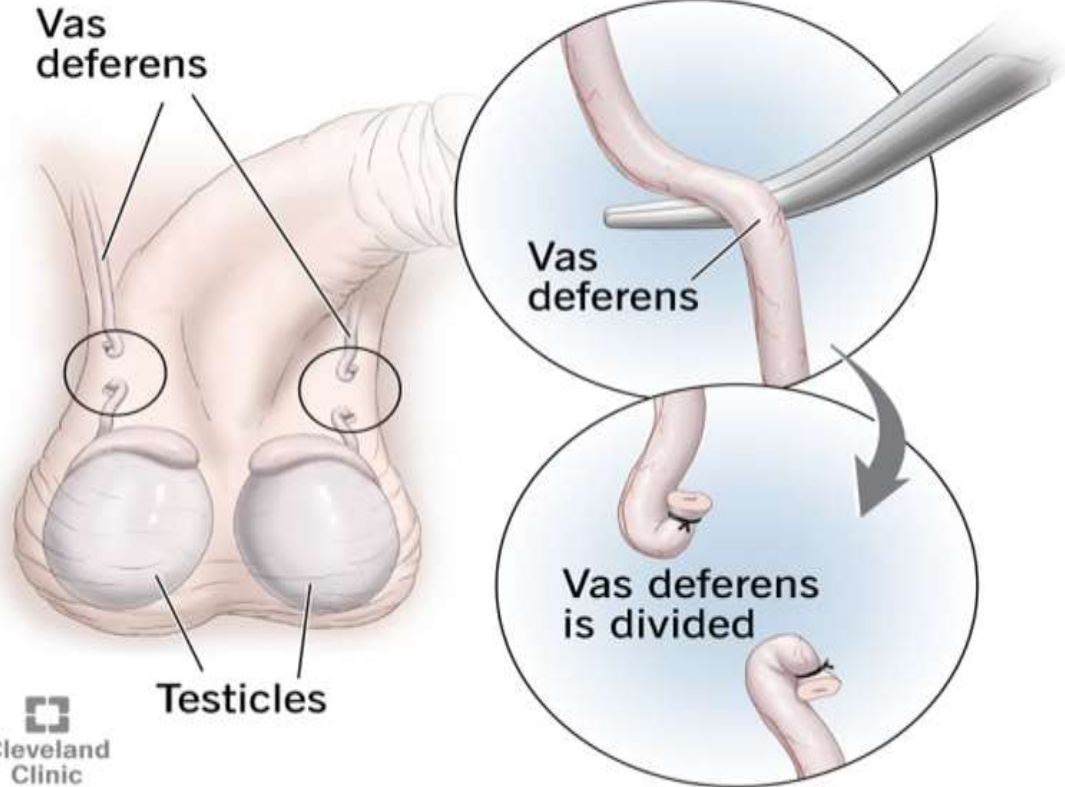
# Male sterilization: Vasectomy

- ▶ Simple operative procedure can be conducted even in rural PHCCs by trained junior medical officers
- ▶ Removal of 1 cm of vas after clamping.
- ▶ Needs backup method for at least 30 ejaculations.
- ▶ Approximately 100% effective method.
- ▶ Non scalpel vasectomy new technique applied today's is more effective.

# Male sterilization procedure

- ▶ Vas deferens on each side is cut; small section is removed, and the ends are tied off or cauterized.

## Vasectomy



**THANK YOU**