



HPV VACCINATION: IS PRE-ADOLESCENCE THE OPTIMAL TARGET AGE?

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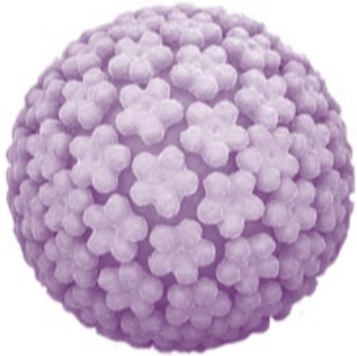
Outline

- **Human Papilloma Virus (HPV)**
- **HPV vaccine**
- **Target age of HPV vaccination**



Human Papilloma Virus

Human Papilloma Virus



- One of the most common sexually transmitted infections
- Over 150 genotypes of the virus
- Four out of five people: ~80% of the population will be infected at some point in their lives
- The virus infects men and women, of all ages and all nationalities
- Spread through intimate contact with genital skin

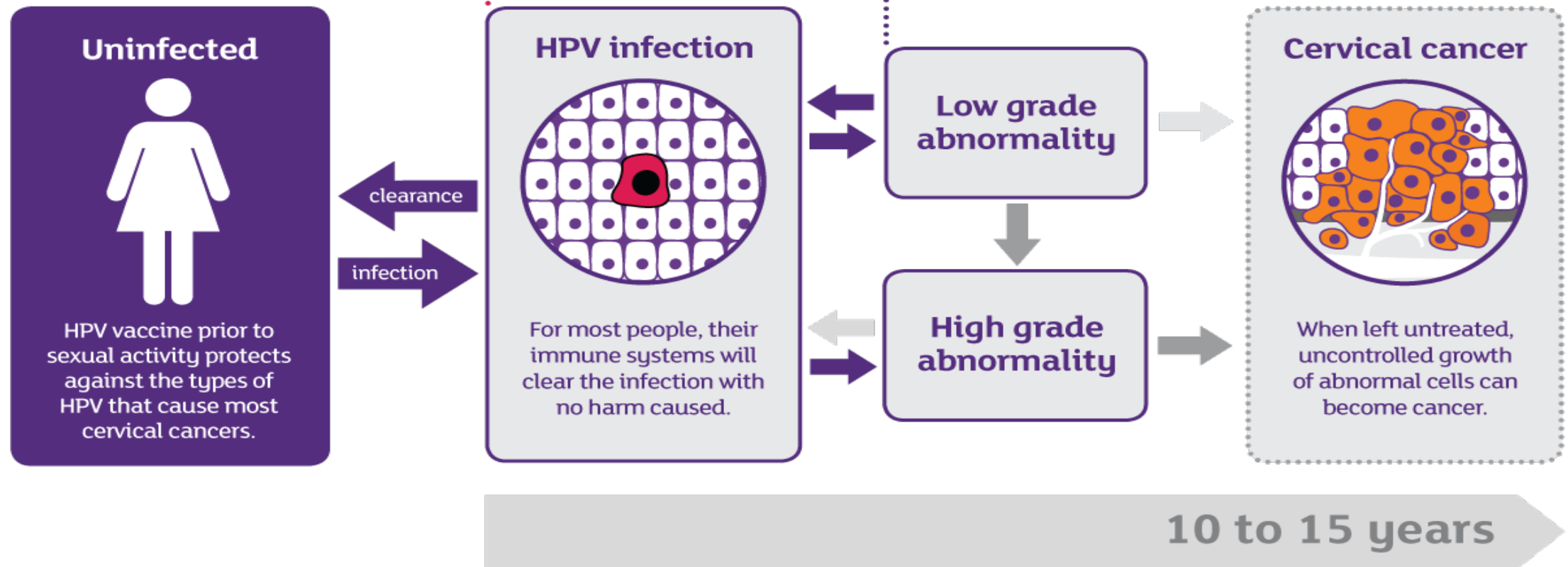
HPV-related cancers

- **Persistent infection with high-risk types of HPV can lead to cancer**
- **6 types of HPV-related cancer: Cervical, oropharyngeal, anal, vulvar, penile, vaginal**
- **Cervical cancer is the most common HPV-related cancer**

How does HPV cause cancer?

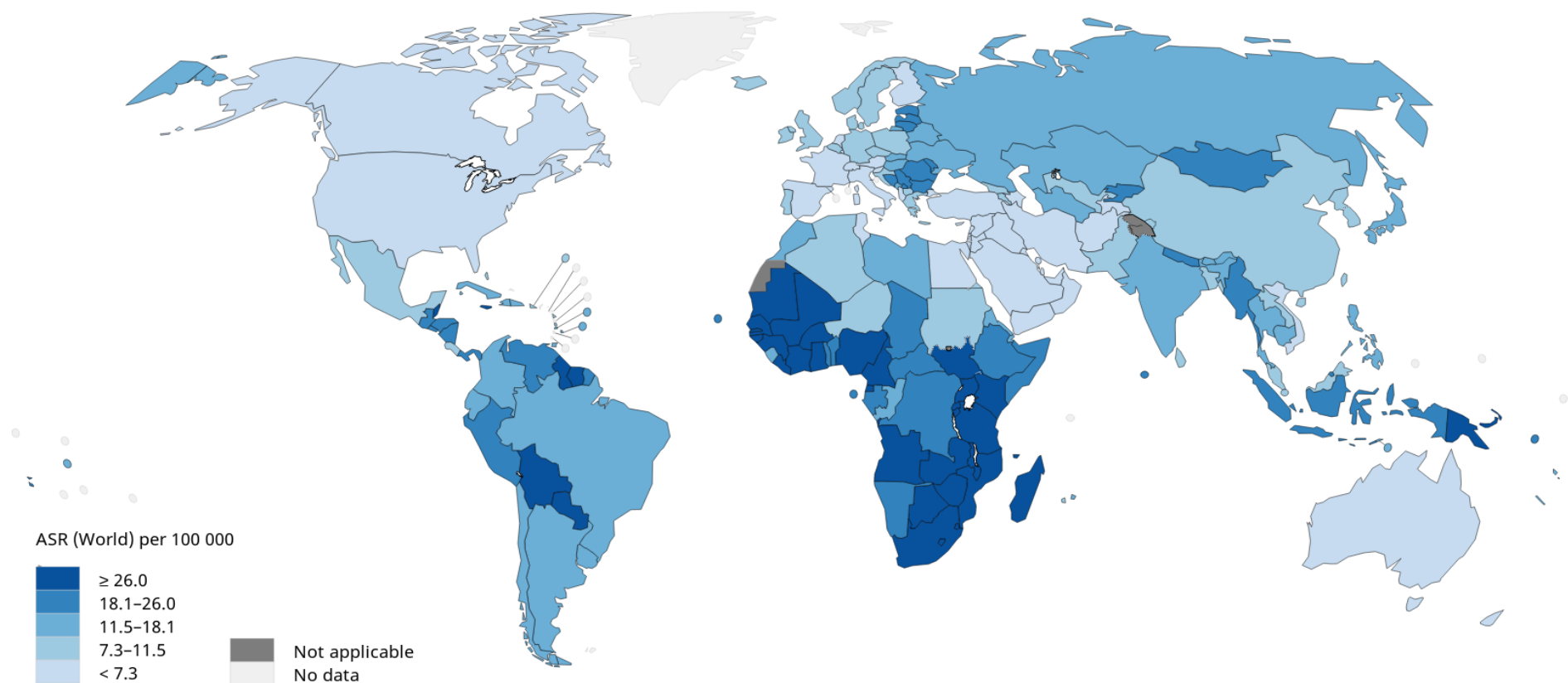
The Cervical Screening Test can detect HPV, even before cell changes occur

The Pap Test detected cell changes after they occurred



Cervical cancer incidence rate

Estimated age-standardized incidence rates (World) in 2018, cervix uteri, all ages

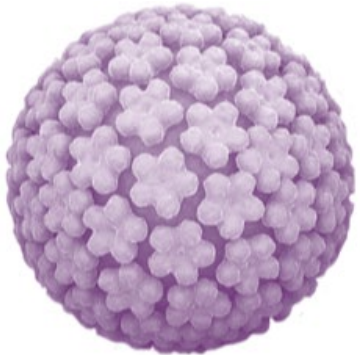


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Data source: GLOBOCAN 2018
Graph production: IARC
(<http://gco.iarc.fr/today>)
World Health Organization

HPV is responsible for:

- **100% of cervical cancer and genital warts**
- **90% of anal cancers**
- **65% of vaginal cancers**
- **50% of vulvar cancers**
- **35% of penile cancers**
- **60% of oropharyngeal cancers**



A world free of cervical cancer



- ▶ Dr Tedros Adhanom Ghebreyesus
Director-General, WHO
- ▶ United Nations General Assembly, New York, USA,
24 September 2018
- ▶ *“We have all the tools to consign cervical cancer to the history books – it is simply not acceptable that women are continuing to die from this avoidable cancer, failure is not an option”*

WHO cervical cancer elimination strategy

Example of definition and 2030 targets

Vision: A world without cervical cancer

Goal: below 4 cases of cervical cancer per 100,000 woman-years

2030
TARGETS

90%

of girls fully vaccinated
with HPV vaccine by 15
years of age

70%

of women screened with
an HPV test at 35 and 45
years of age and all
managed appropriately

30%

reduction in mortality
from cervical cancer

The 2030 targets and elimination threshold are subject to revision depending on the outcomes of the modeling and the WHO approval process



HPV vaccine

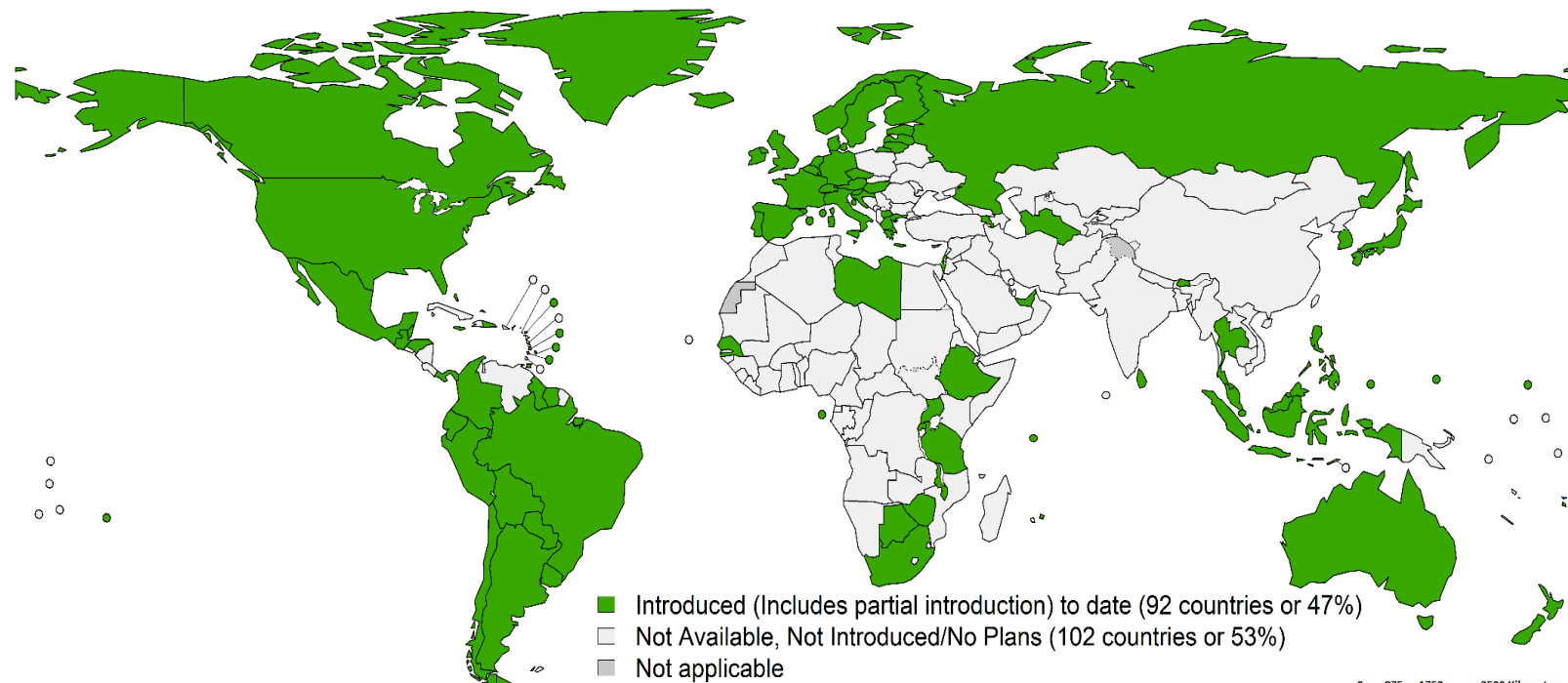
Internationally licensed HPV vaccines



- **Cervarix® 2vHPV: 16, 18**
- **Gardasil® 4vHPV: 16, 18, 6, 11**
- **Gardasil® 9vHPV: 16, 18, 6, 11, 31, 33, 45, 52, 58**

- **16, 18: linked to ~70% cervical cancers (high risk HPV)**
- **6, 11: linked to ~90% genital warts (low risk HPV)**
- **31, 33, 45, 52, 58: other HR-HPV linked to cancer**

Countries with HPV vaccine included in national schedule



Date of slide: 2019-02-15
Map production: Immunization, Vaccines and Biologicals (IVB), World Health Organization(WHO)
Data source: IVB database as at 14th February 2019

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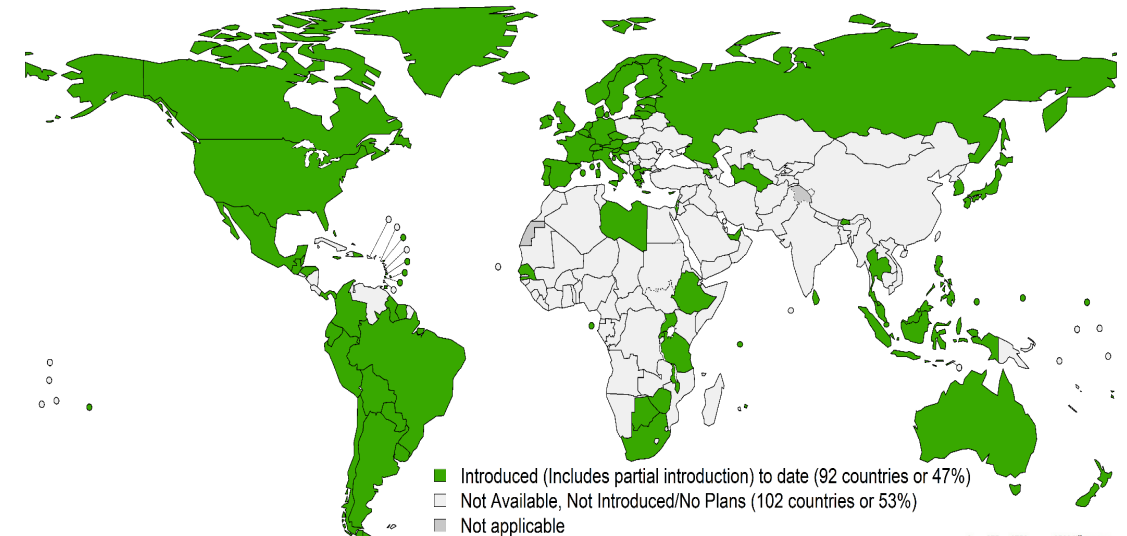
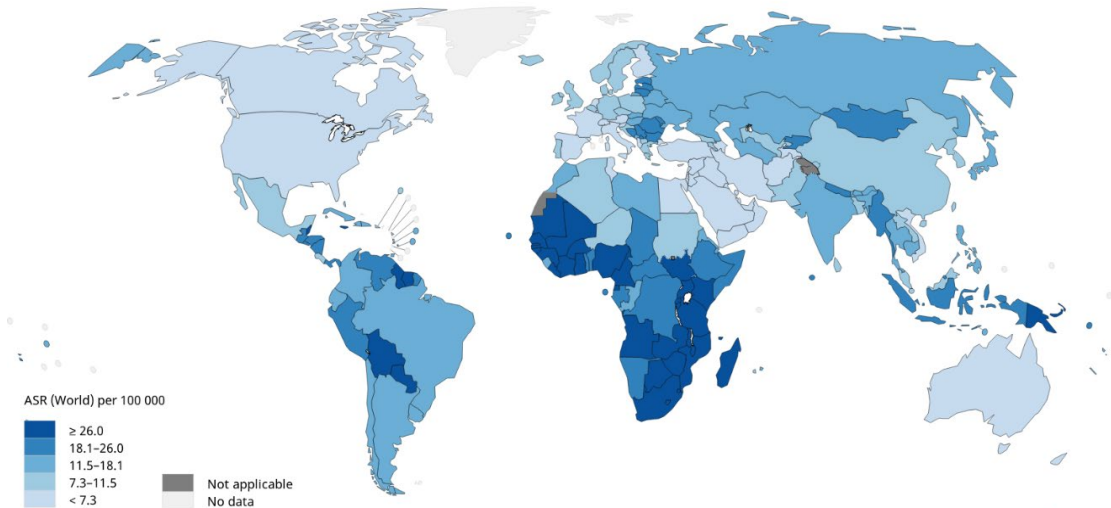
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0 875 1750 3500 Kilometers



Comparison of cervical cancer incidence and HPV vaccine availability

Estimated age-standardized incidence rates (World) in 2018, cervix uteri, all ages



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0 875 1750 3500 Kilometers





Target age of vaccination

WHO recommendation

Primary target group

FEMALE
9-14
YEARS

2 x DOSES



6 months interval



FEMALE
15-26
YEARS

3 x DOSES



2 months
interval



4 months
interval



Introduction of vaccine to multiple age cohort, 9-14 years (15-18 years if feasible) in first year

WHO recommendation

Secondary target group

- ▶ **Females aged ≥ 15 years or males – country level decision (global vaccine shortage)**
- ▶ **Lower priority than young girls**
- ▶ **Cost effectiveness is not favorable**

CDC Recommendation

Boys and girls at 11 or 12 years old, and a second dose 6-12 months later

Catch-up vaccination up to 26 years

For adults aged 27 - 45 years, public health benefit of HPV vaccination in this age range is minimal



EU guidelines

- ▶ **Primary target group - preadolescent girls 9-14 years**
- ▶ **School-based vaccination plans or delivery through primary care services**
- ▶ **Multiple age-cohort vaccination and temporary catch-up programmes**

Australian guidelines

- ▶ **Routine school based vaccination of boys and girls in first year of high school (age 12 – 13)**
- ▶ **National HPV Vaccination Program in Australia since 2007**
- ▶ **Catch up program for women up to 26 years**
- ▶ **Expected to be a first country to eliminate cervical cancer**

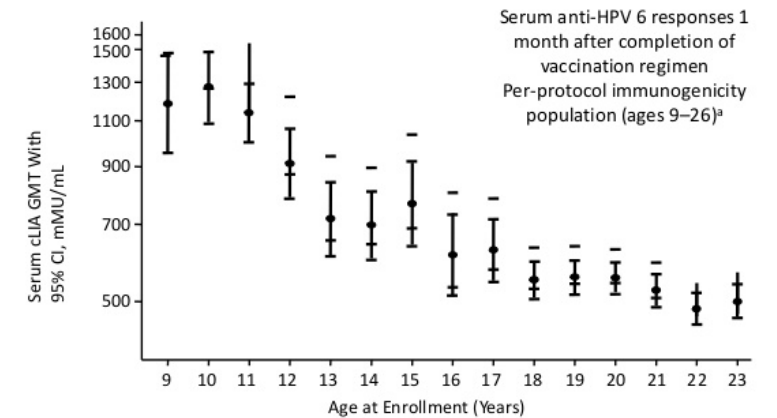
Recent meta analysis

- ▶ **“Population-level impact and herd effects following the introduction of HPV vaccination programmes: updated systematic review and meta-analysis” study by Drolet et al, Lancet, June 2019**
- ▶ **Data from 60 million individuals and up to 8 years of post-vaccination follow-up**
- ▶ **Substantial impact of HPV vaccination programmes on HPV infections**
- ▶ **HPV 16 and 18 decreased by 83% among girls aged 13–19 years, and by 66% among women aged 20–24 years**
- ▶ **Decrease of CIN2+ among girls and women, and on anogenital warts among girls, women, boys, and men**
- ▶ **Programmes with multi-cohort vaccination and high vaccination coverage had a greater direct impact and herd effects**

The younger is better?

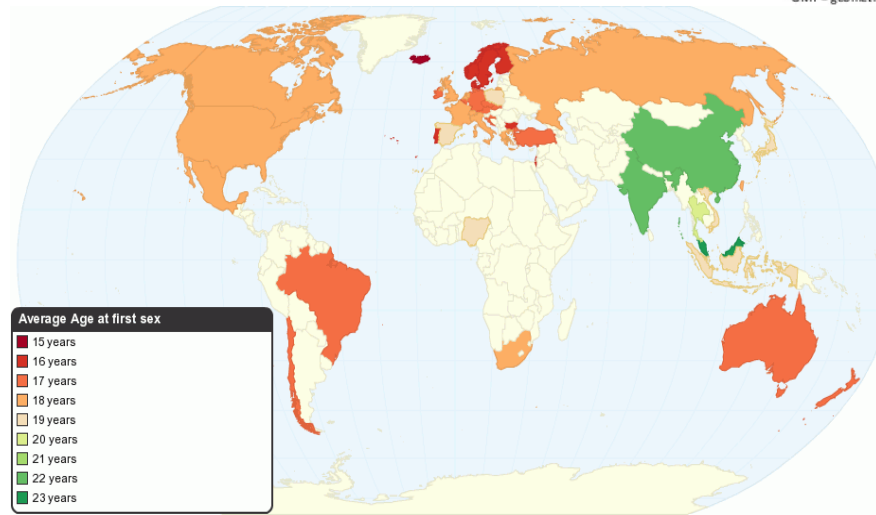
- ▶ Better immune response
- ▶ Less risk to be sexually active
- ▶ Less issues around promiscuity

Higher Immune Response in Adolescents Versus Young Adults¹



^aInclusive of protocols 007, 013, 015, 016 and 018; all GMTs measured using competitive Luminex[®] immunoassay; women 24–26 years of age were omitted in the figure because of small numbers. Similar results were observed for HPV 11, 16, and 18. GMT = geometric mean titer.

AR et al. *J Infect Dis.* 2007;196:1153–1162.



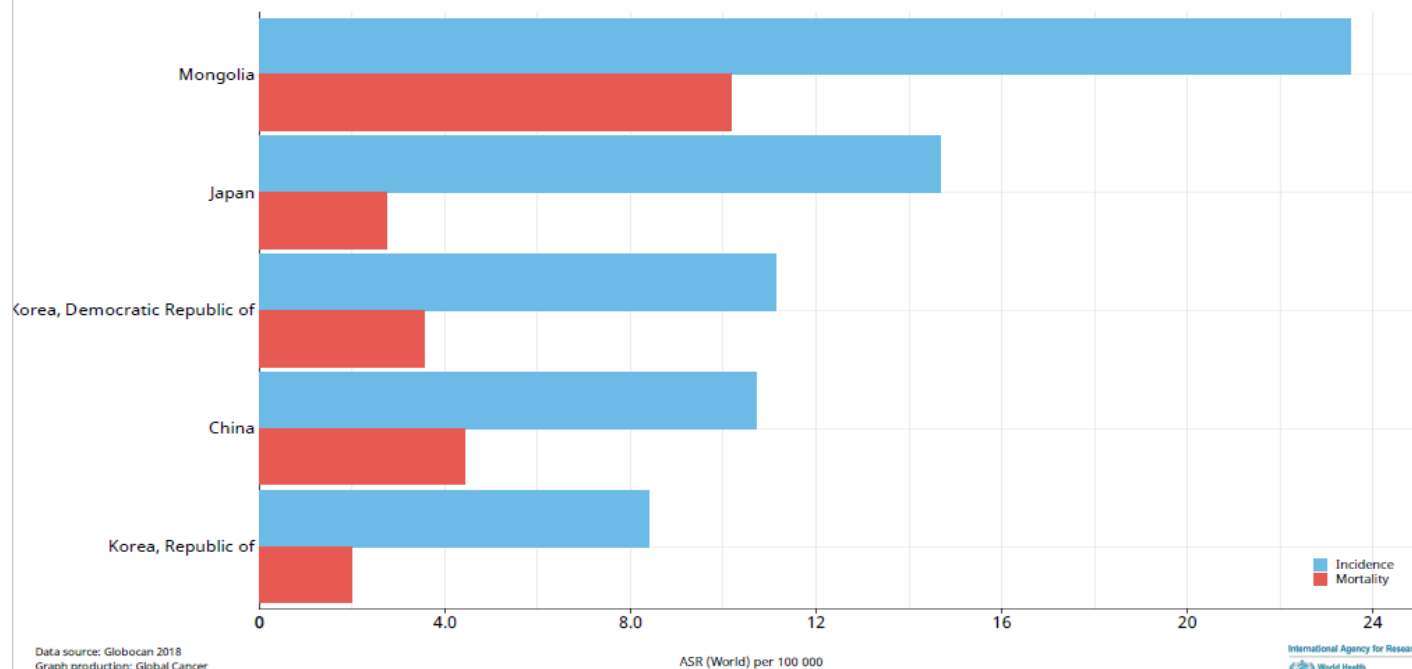
The younger is better?

- ▶ Less reactions, like mass psychogenic illness
- ▶ (fainting, twitching is more frequent among teenagers)



Case of Mongolia

Estimated age-standardized incidence and mortality rates (World) in 2018, cervix uteri, all ages



► Cervical cancer is the 2nd most prevalent cancer

► HPV prevalence is high

Case of Mongolia

- ▶ HPV pilot school based vaccination in 2012 in 4 sites
- ▶ 44,800 doses donated by MCA, USA
- ▶ ~10,885 girls vaccinated age 11-15 years – coverage rate 77.4%, 75.4% and 64.9%
- ▶ Anti vaccination opposition
- ▶ Study to evaluate results of vaccination
- ▶ Plan to re-start of vaccination in 2020



Summary

- ▶ **HPV virus can cause cancer in both men and women**
- ▶ **HPV vaccination is effective to prevent from HPV-related cancers among men and women**
- ▶ **Elimination of cervical cancer as a public health issue is both realistic and attainable**
- ▶ **HPV vaccination of girls, as well as boys, at preadolescent age (9-14 years) is utmost important**