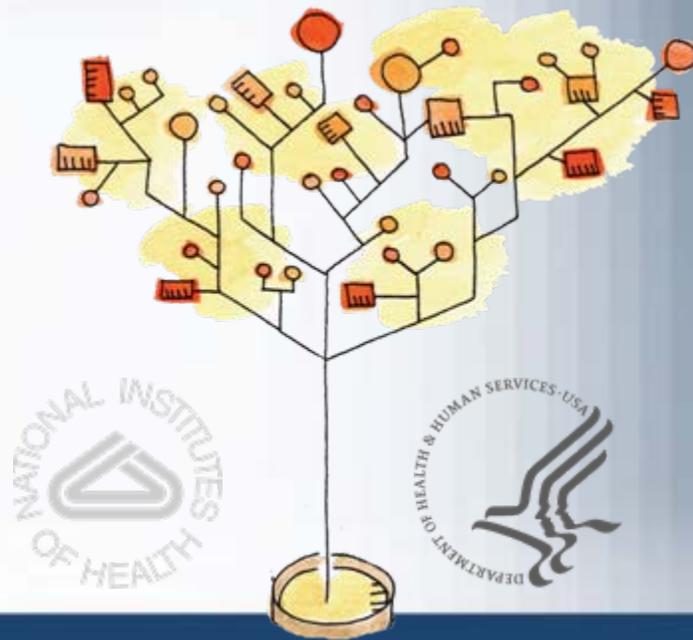


# National Institutes of Health and the Private Sector HPV story

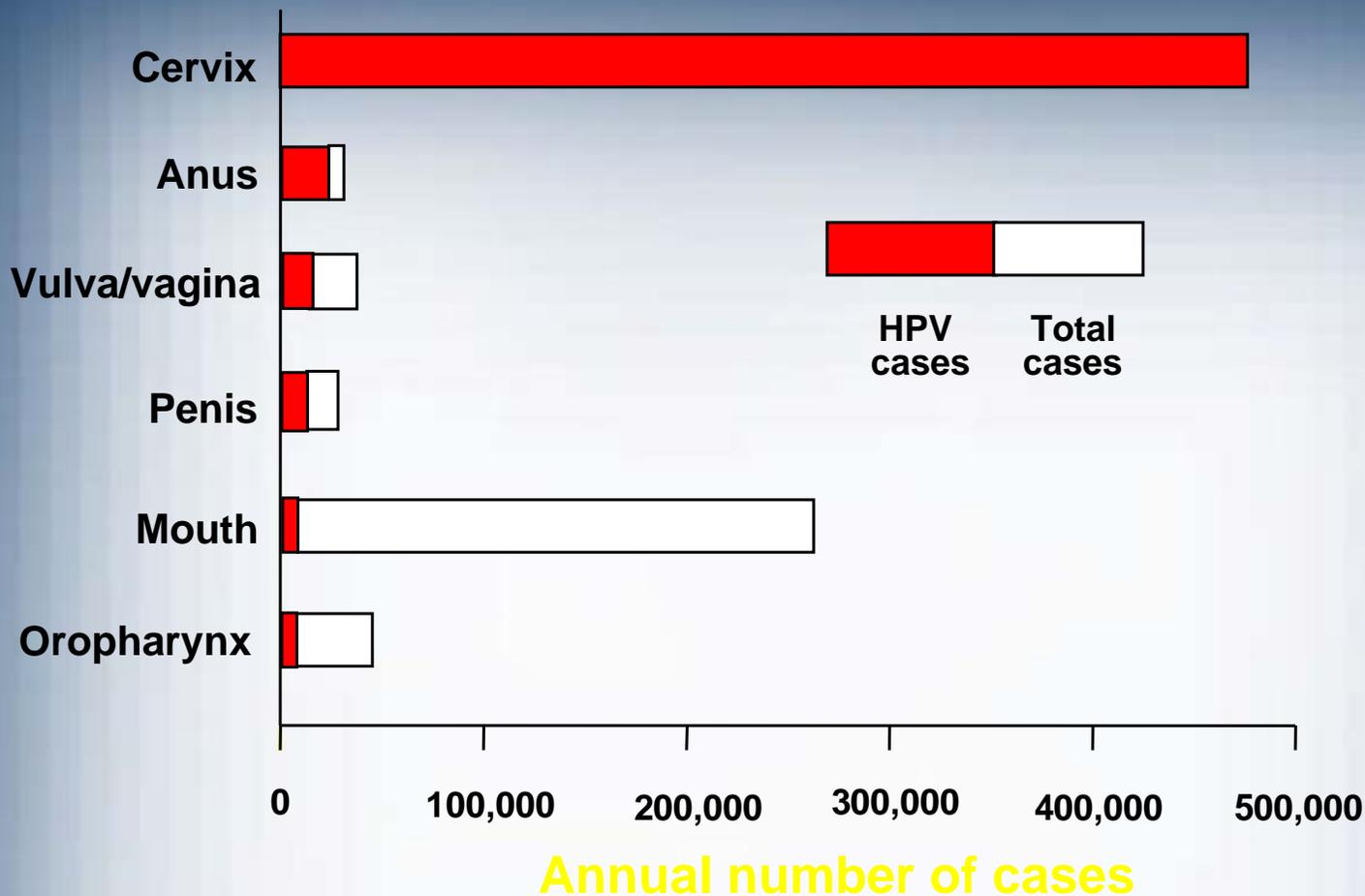


# Cervical Cancer – Viral Etiology

- HPV etiological link
  - Sexual contact is the primary mode of transmission
- About 500,000 women per year
  - 270,000 deaths (85% deaths in developing nations)
- Squamous cell cervical cancer and cervical adenocarcinoma
- HPV also causes approximately 35-50% of vulvar and vaginal cancers.



# Worldwide Incidence and Distribution of Cancers Attributable to HPV



***Cervical cancer represents ~10% of all female cancers worldwide***

***Adapted from Parkin, Int J Cancer 118:3030, 2006***



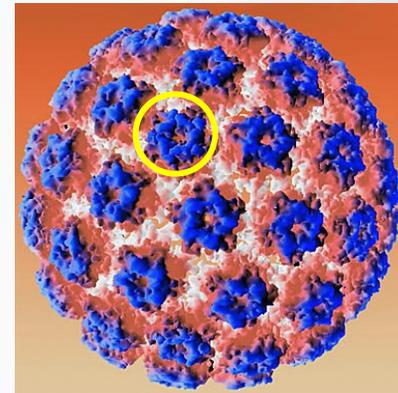
# ***What is the HPV vaccine?***

- **It is a recently licensed preventive vaccine that can protect women against about 70% of cervical cancer and about 90% of genital warts.**
- **The vaccine is not infectious and is similar to the Hepatitis B virus vaccine. It is given by injection. Full protection requires 3 vaccinations over a six month period.**
- **Although the vaccine is highly effective in preventing infection, it does not appear to be effective in treating infections that are already present.**
- **No serious side effects have been reported.**



# *Principles of the vaccine*

- To date, successful viral vaccines are primarily prophylactic.
- A sub-unit vaccine approach seemed preferable for a prophylactic HPV vaccine (so you don't need to worry about the viral oncogenes).
- The vaccine is composed of a single viral protein, which self-assembles to form virus-like particles that can induce high titers of neutralizing antibodies.



# ***Three Phase III Trials Are in Progress***

<b><u>Sponsor</u></b>	<b><u>VLP Types</u></b>	<b><u>Trial Sites</u></b>	<b><u>Enrolled</u></b>
<b>Merck:</b>	<b>HPV16, 18, 6, 11</b>	<b>Multicentric</b>	<b>25,00</b>
<b>GSK:</b>	<b>HPV16, 18</b>	<b>Multicentric</b>	<b>18,000</b>
<b>NCI:</b>	<b>HPV16, 18</b>	<b>Costa Rica</b>	<b>7,500</b>

**Women followed for several years**

**Virologic Endpoints: Persistent cervical HPV DNA**

**Clinical Endpoints: *Intermediate and high grade dysplasias (cervical, vulvar, vaginal) & genital warts (for Merck vaccine)***



# Gardasil Approval Specifics

- **US FDA approved for 9-26 yr old females in June '06**

**CDC's ACIP recommended June '06 for:**

- **routine vaccination of 11-12 yr old**
  - **catch up vaccination 13-26 yr old**
  - **9-10 yr old vaccination at physician's discretion**
  - **inclusion in Vaccines for Children program**
- **European Union approved for 9-26 yr old females; 9-15 yr old boys**



# NIH Licensing Activity

- License to MedImmune effective January 7, 1997
  - Sublicense to GlaxoSmithKline
- License to Merck effective December 10, 1997



# The Settlement with Merck and GSK

- **Placate**
- **Cooperate**
- **Compensate**
- **Vaccinate**

