

# Cancer of the Cervix

## An Overview

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National Center for Chronic Disease Prevention  
and Health Promotion**



DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR DISEASE CONTROL AND PREVENTION

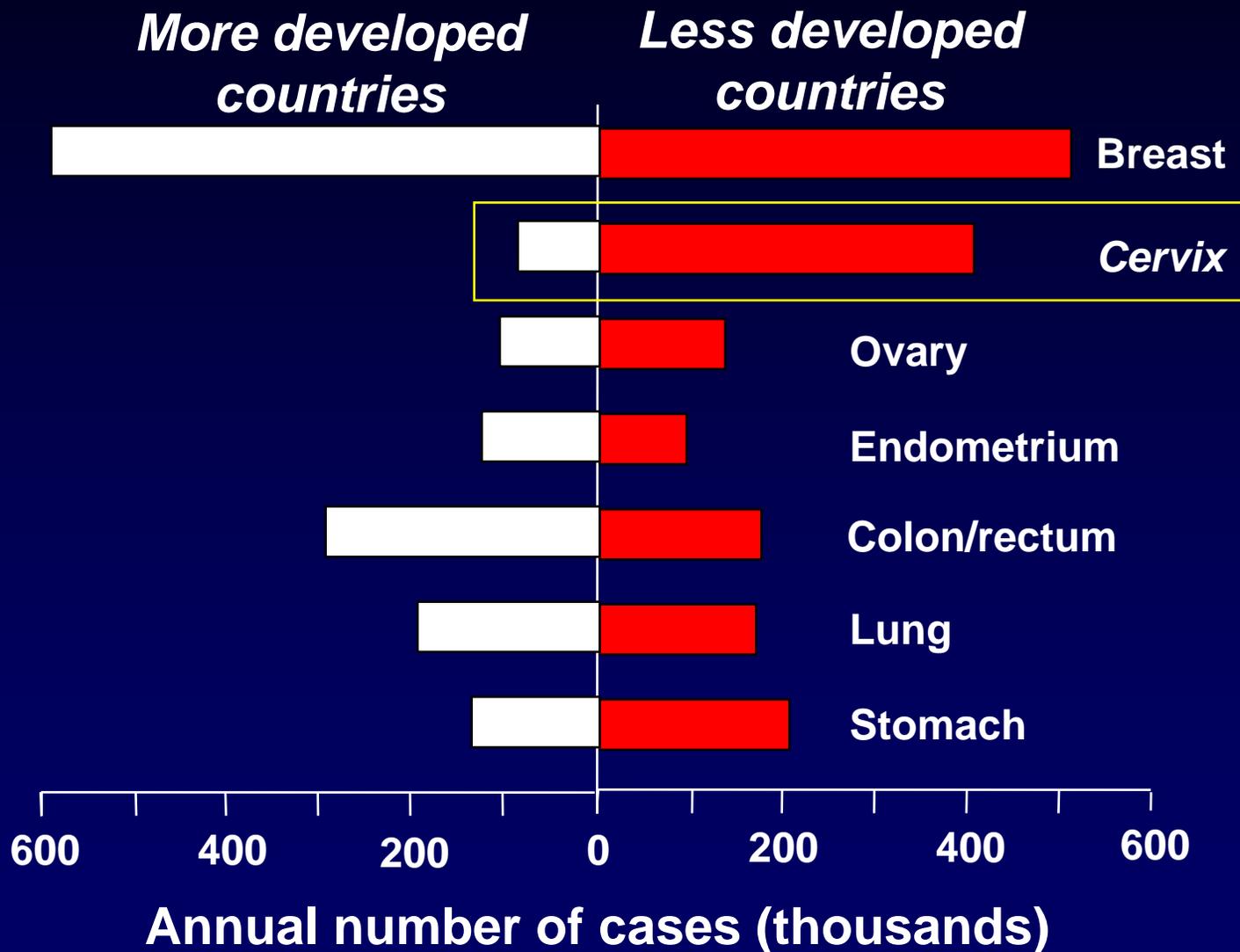


# Outline

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- ◆ **Surveillance**
- ◆ **Burden of Cervical Cancer**
- ◆ **Screening**
- ◆ **Diagnosis**
- ◆ **Costs**

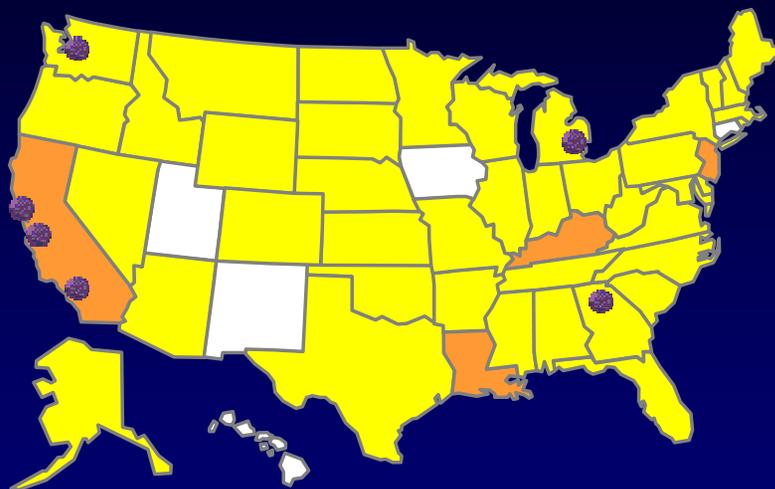
# The Most Common Cancers in Women



Adapted from Parkin et al, Eur J Cancer 37:S4, 2001

# Cervical Cancer Surveillance

## National Program of Cancer Registries (NPCR) and Surveillance Epidemiology and End Results (SEER)



- ◆ SEER since 1973
- ◆ NPCR Since 1995
- ◆ 96% population coverage

- SEER
- NPCR
- NPCR/SEER
- SEER Metro



# Cervical Cancer Disease Burden in the U.S.

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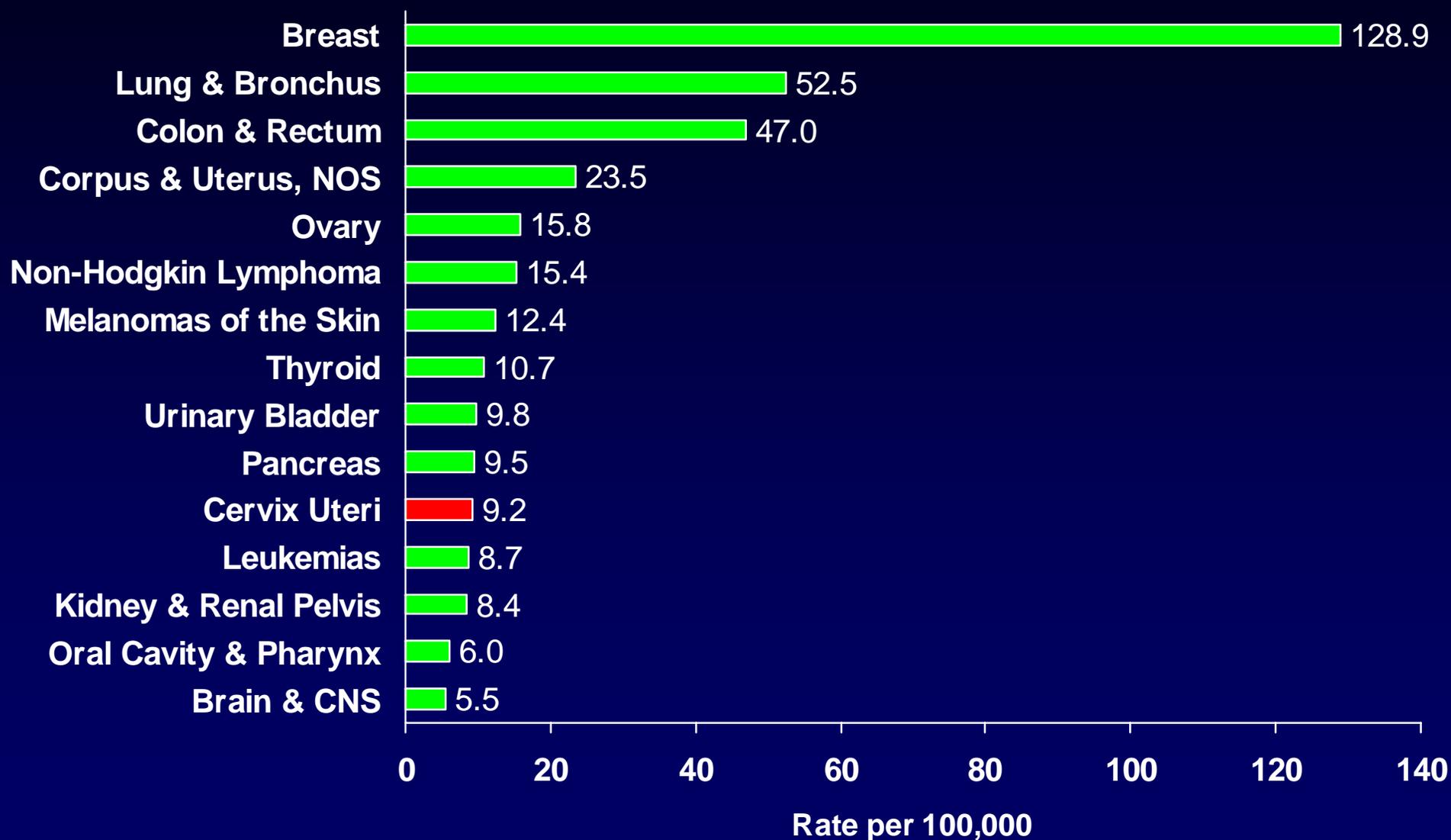
- ◆ **Two types of cervical cancer**
  - **Squamous cell carcinoma**
  - **Adenocarcinoma (20% of all invasive cases)**
  
- ◆ **2002 – 12,085 new cervical cancer cases (NPCR)\***
- ◆ **2002 – 3,952 cervical cancer deaths (NCHS)#**
  
- ◆ **2006 Estimates (American Cancer Society)+**
  - **9,710 new cervical cancer cases**
  - **3,700 cervical cancer deaths**

\*U.S. count includes state cancer registries in the National Program of Cancer Registries that met certain data quality criteria for cancer incidence, and cover approximately 93% of the U.S. population.

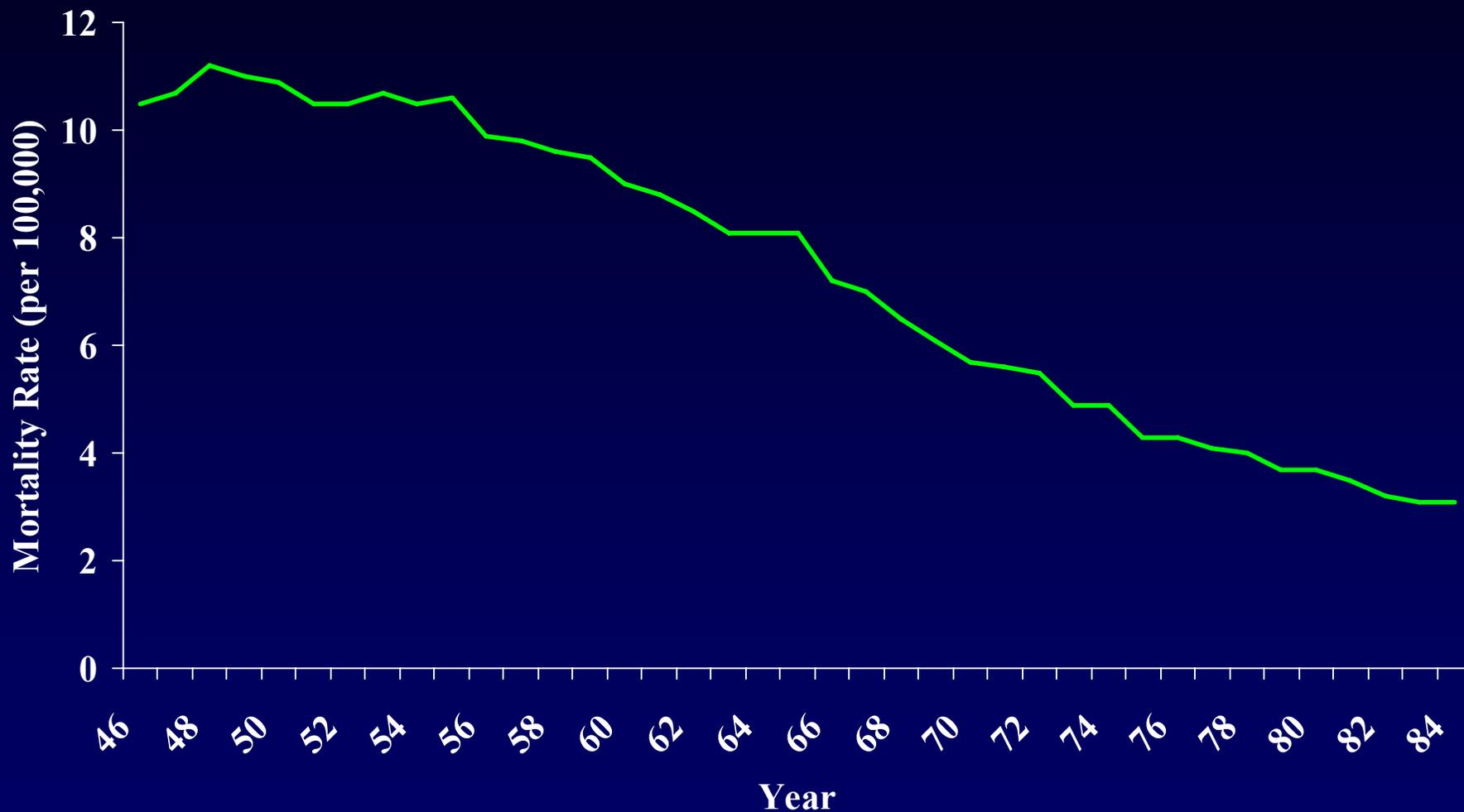
#Mortality data are from the National Vital Statistics Surveillance System, NCHS, and cover 100% of the U.S. population ([www.cdc.gov/nchs](http://www.cdc.gov/nchs))

+Cancer Facts and Figures, 2006; American Cancer Society

# Age-Adjusted Invasive Cancer Incidence Rates, Among Women, U. S., 2000

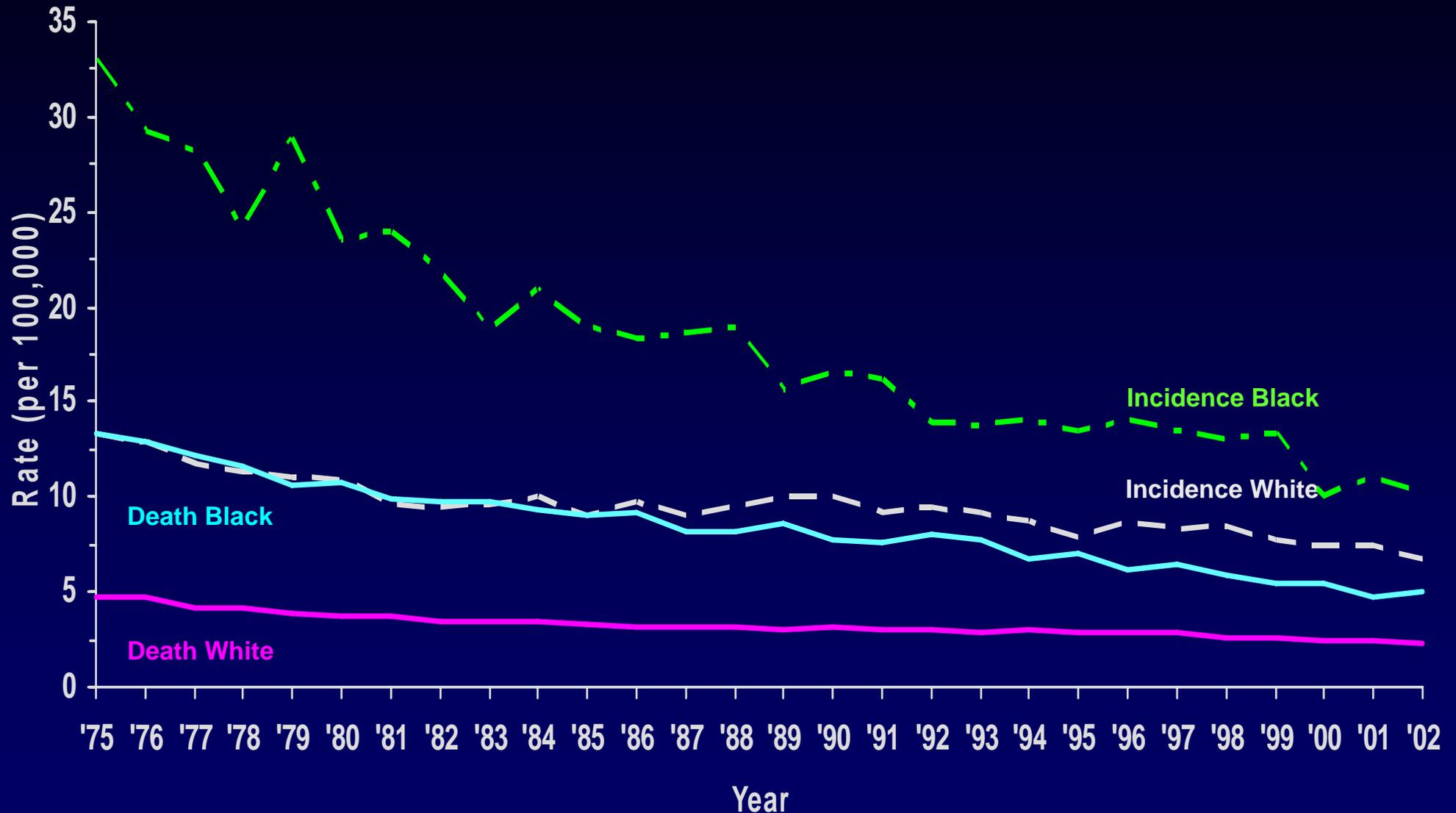


# Cervical Cancer Mortality Rates, U.S., 1946-1984



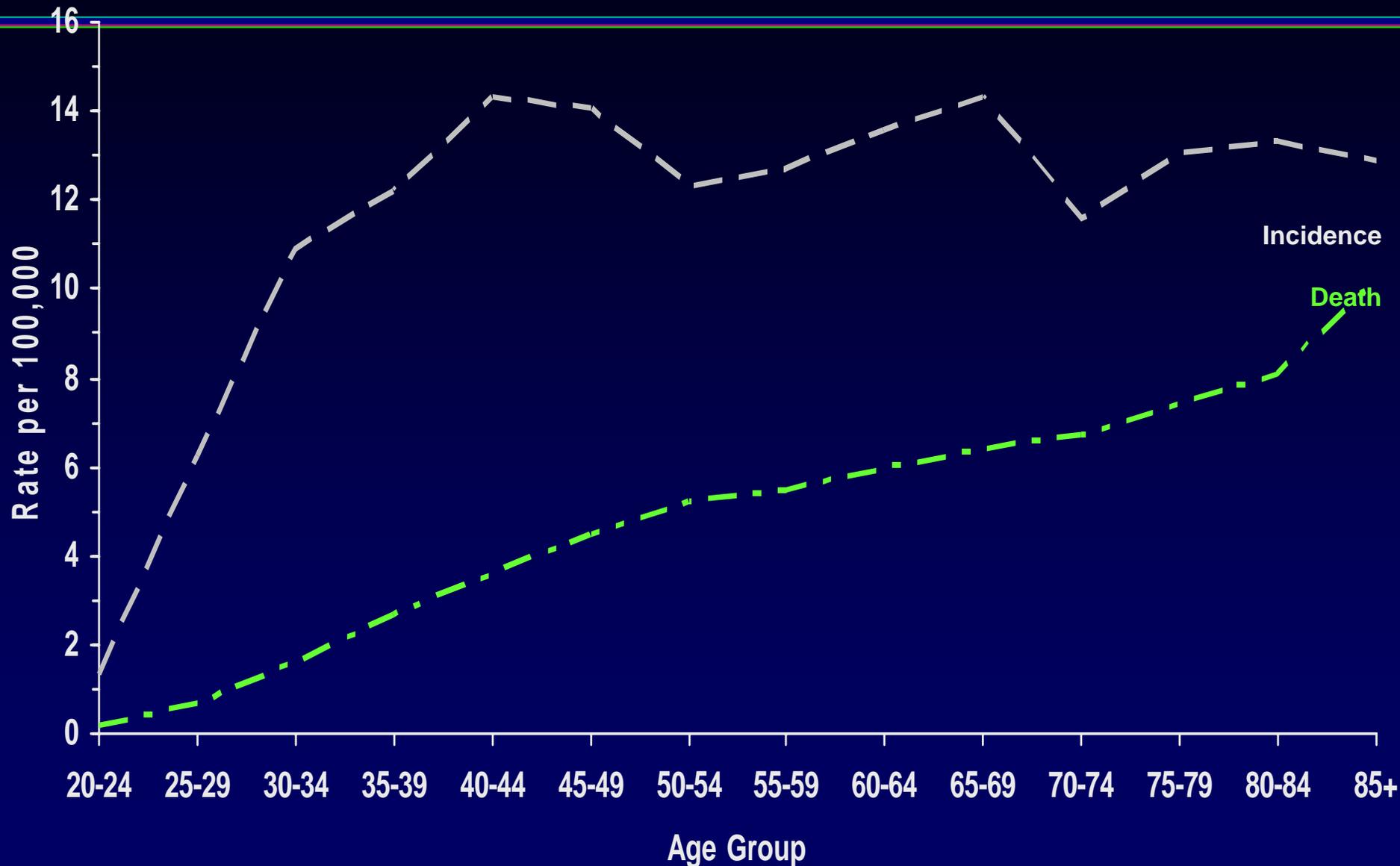
Source: Program for Improving Clinical Pap Smear Programs and Management, Office of Population Affairs, DHHS, 1987.

# Invasive Cervical Cancer Incidence and Mortality Rates,\* by Race, SEER in US, 1975-2002



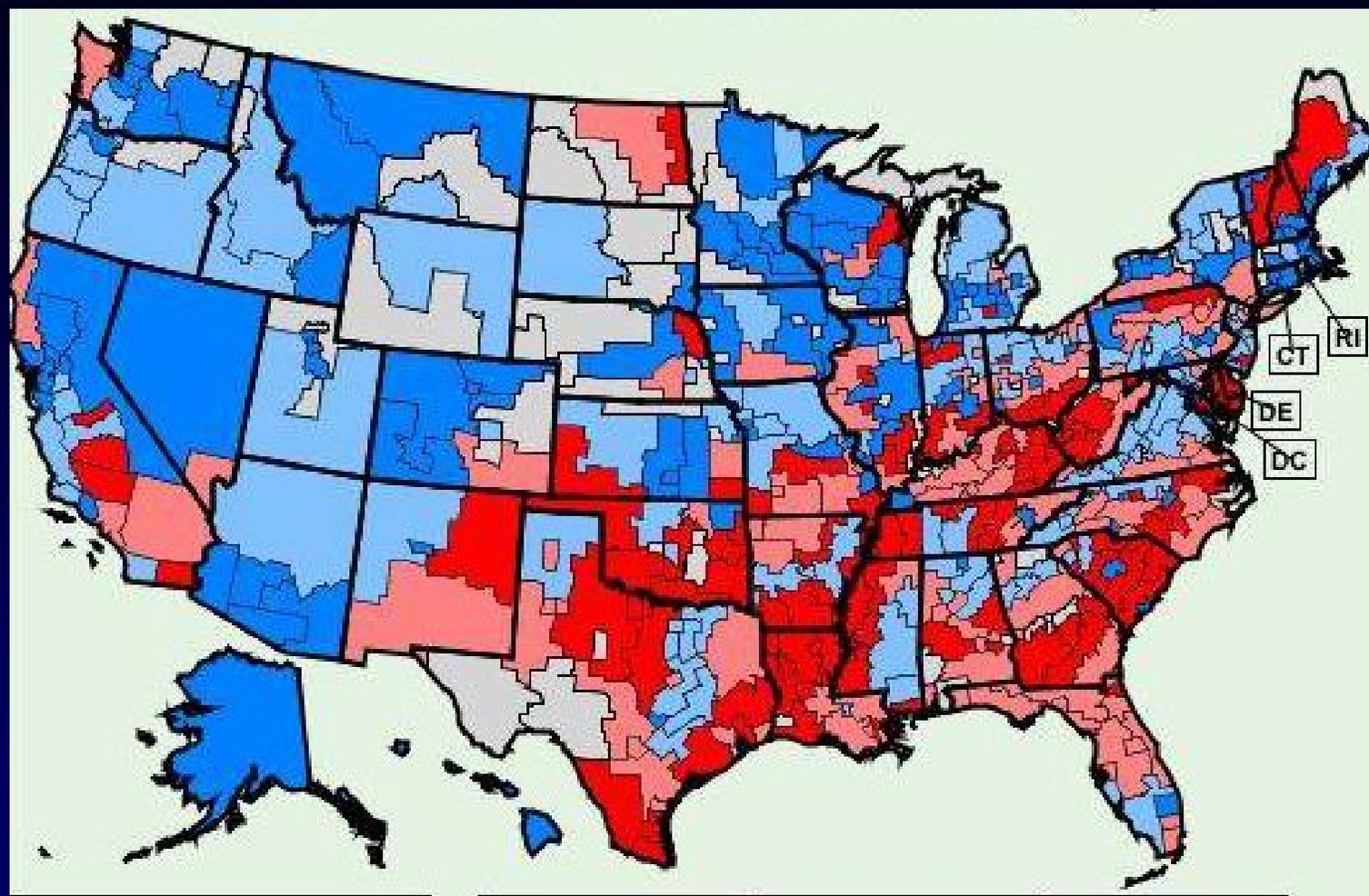
\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
Source: SEER Cancer Statistics Review, 1975-2002

# Invasive Cervical Cancer Incidence and Mortality Rates,\* by Age Group, SEER in U.S., 1998-2002

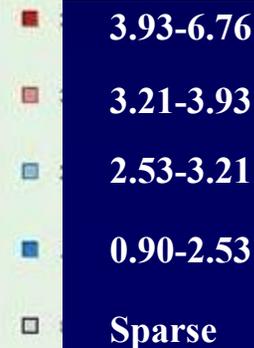


\*Source: SEER Cancer Statistics Review, 1975-2002

# Age-adjusted Cervical Cancer Mortality Rates by State Economic Areas\*, All Women, U.S., 1995-1999

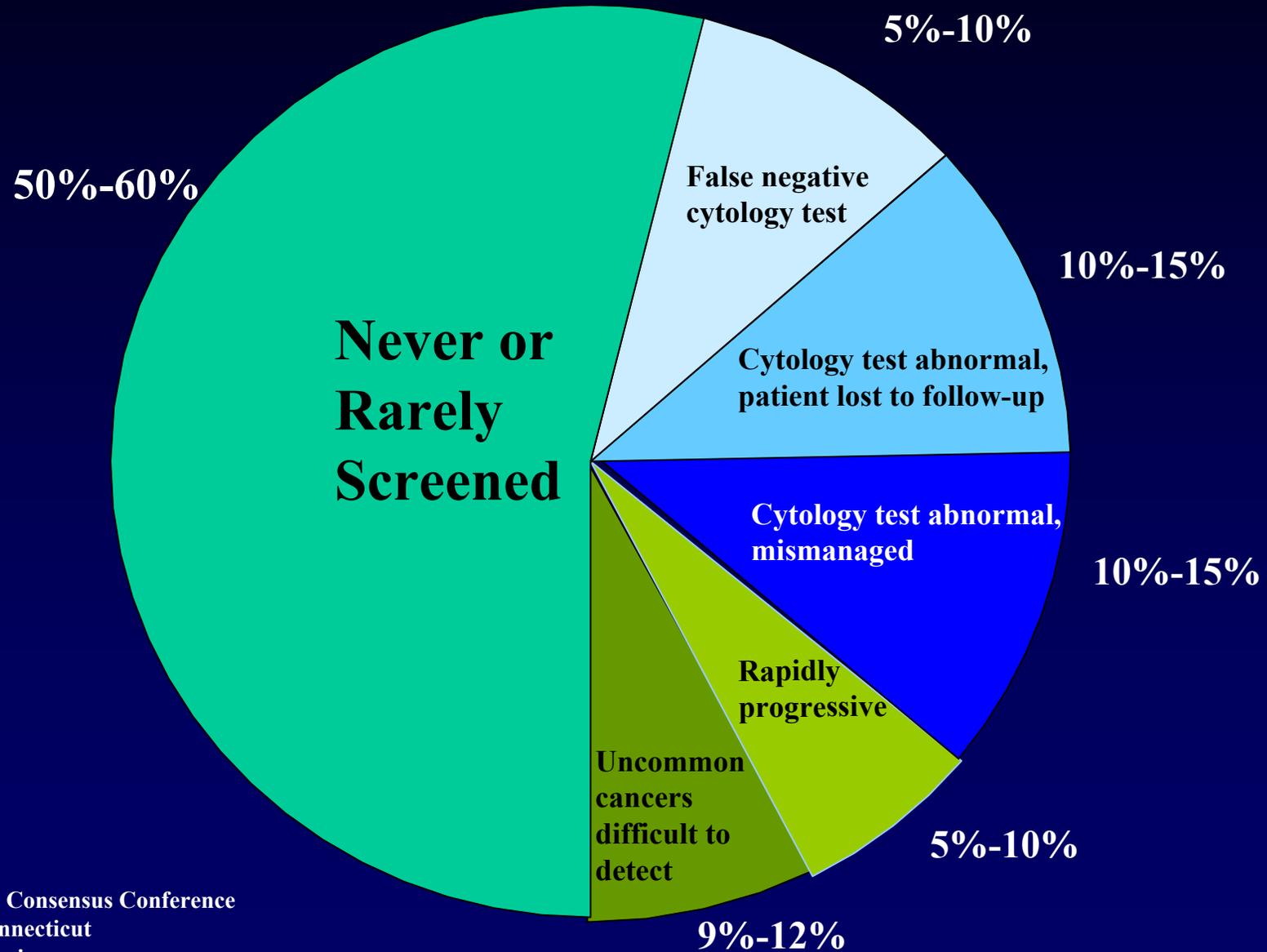


Rates per 100,000 person-years,  
1995-1999



Source: Grauman D., NCI; <http://www3.cancer.gov/atlasplus/>  
\*State Economic Area: One or more socio-economically similar counties within a state

# Factors Contributing to Cervical Cancer

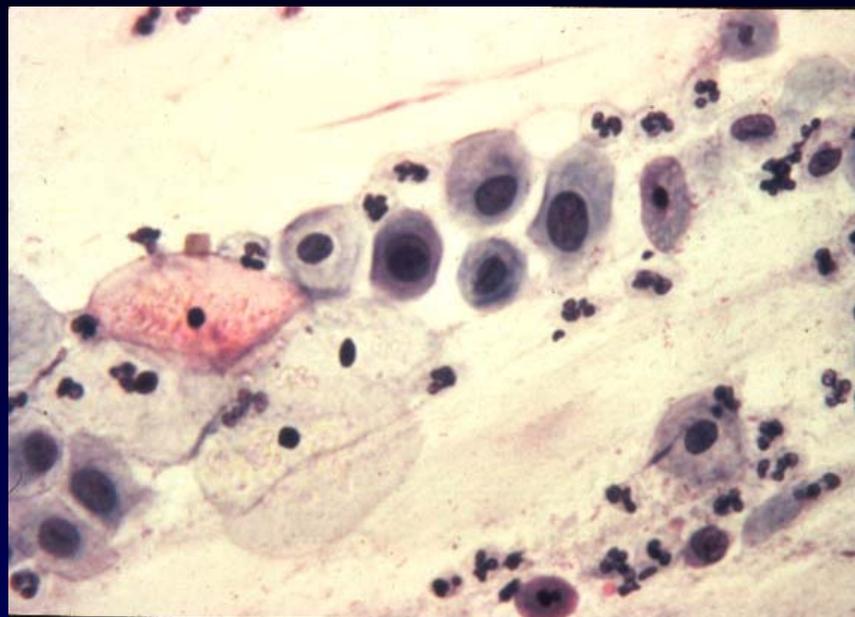


Sources: NIH Consensus Conference  
Janerich, Connecticut  
Sung, California

# Cervical Cancer Screening Methods

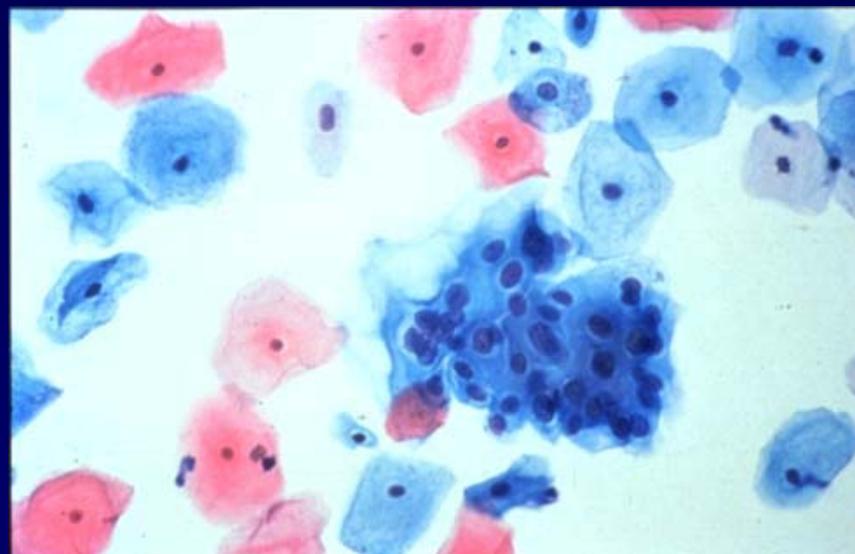
## ◆ Conventional Cytology

- Sensitivity: 51–88%
- Specificity: 95–98%



## ◆ Liquid-based Cytology

- Sensitivity: 61-95%
- Specificity: 78-82%



Source: Meyers et al., 2000; Nanda, et al., 2000; Belinson, et al., 2001

# Abnormal Pap Test Results (Bethesda 2001)

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## Squamous Cell

- ◆ Atypical squamous cells of undetermined significance (ASC-US)
- ◆ Atypical squamous cells cannot exclude high grade squamous intraepithelial lesion (ASC-H)
- ◆ Low grade squamous intraepithelial lesion (LSIL)
- ◆ HSIL
- ◆ Squamous Cell Cancer

## Glandular Cell

- ◆ Atypical glandular cells (AGC)
- ◆ Adenocarcinoma in situ (AIS)
- ◆ Adenocarcinoma

# Cervical Cancer Screening Recommendations

	<b>USPSTF 2003</b>	<b>ACS 2002</b>	<b>ACOG 2003</b>
<b>Age to start</b>	Age 21 or within 3 yrs of sexual activity	Age 21 or within 3 yrs of sexual activity	Age 21 or within 3 yrs of sexual activity
<b>Interval</b>			
<30 yr	Conv: at least every 3 yrs	Conv: 1 yr LBC: 2 yr	1 yr
≥ 30 yr		2-3 yrs	2-3 yrs

USPSTF – U.S. Preventive Services Task Force

ACS – American Cancer Society

ACOG – American College of Obstetricians and Gynecologists

Conv – Conventional Cervical Cytology

LBC – Liquid-based Cytology

# Prevalence of Cervical Cancer Screening, National Health Interview Survey, United States, 2000

Group	% Pap test past 3 years
All women	82%
Insured	
yes	85%
no	62%
Country of birth	
US born	83%
Foreign born in U.S. <10 yrs	61%
Race/Ethnicity	
Hispanic	77%
Non-Hispanic White	83%
Non – Hispanic Black	84%
Asian	71%

Swan J, Breen N, Coates RJ, Rimer BK, Lee NC. Progress in cancer screening practices in the United States: results from the 2000 National Health Interview Survey. *Cancer*. 2003;97:1528-40.

# HPV Test – Hybrid Capture 2 (HC2)

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- ◆ **A nucleic acid solution hybridization assay with signal amplification that uses long synthetic RNA probes complementary to the DNA sequence of the 13 high risk HPV types.**
- ◆ **Easy to perform in clinical practice and amenable to automation**
- ◆ **The only system approved by FDA**

# FDA Approved Use of HPV Test

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## ◆ Triage:

Hybrid Capture II high risk panel (HC2) for ASC-US  
Pap test results

## ◆ Primary screening:

HC2 as adjunct to Pap test in women 30 years of age  
and older. If both tests are negative, next cervical  
cancer screening should not occur for at least 3  
years.

# Organization Recommendations for HPV DNA Use in Cervical Cancer Screening

	<b>USPSTF</b>	<b>ACS</b>	<b>ACOG</b>	<b>ASCCP</b>
<b>ASC-US triage</b>	<b>Insufficient Evidence</b>	<b>Not addressed</b>	<b>Recommended</b>	<b>Recommended</b>
<b>Primary screening with Pap test</b>	<b>Not addressed</b>	<b>Option</b>	<b>Recommended</b>	<b>Recommended</b>

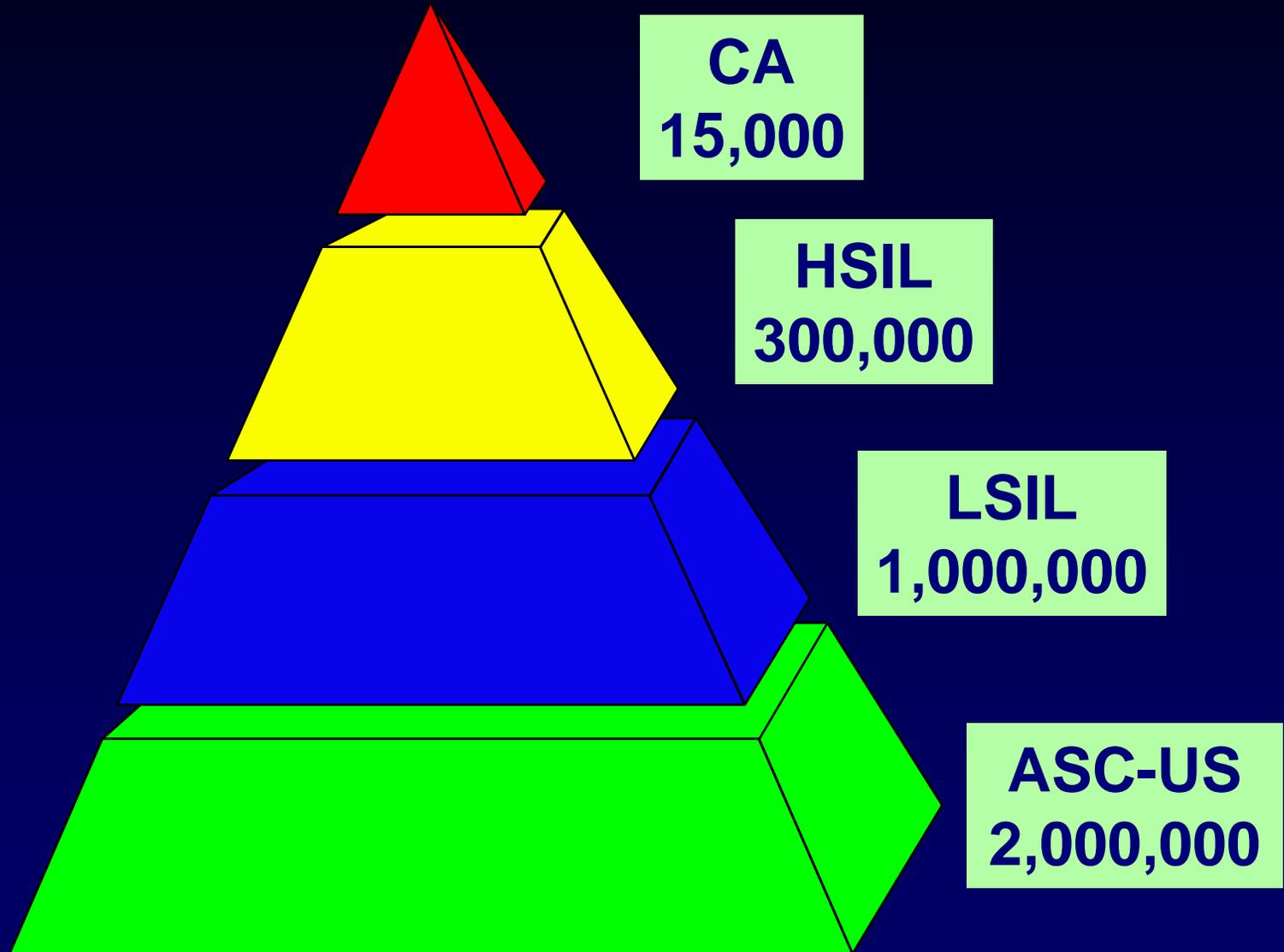
**USPSTF – U.S. Preventive Services Task Force**

**ACS – American Cancer Society**

**ACOG – American College of Obstetricians and Gynecologists**

**ASCCP – American Society of Colposcopy and Cytopathology**

# Estimated Annual Abnormal Pap Tests, U.S.



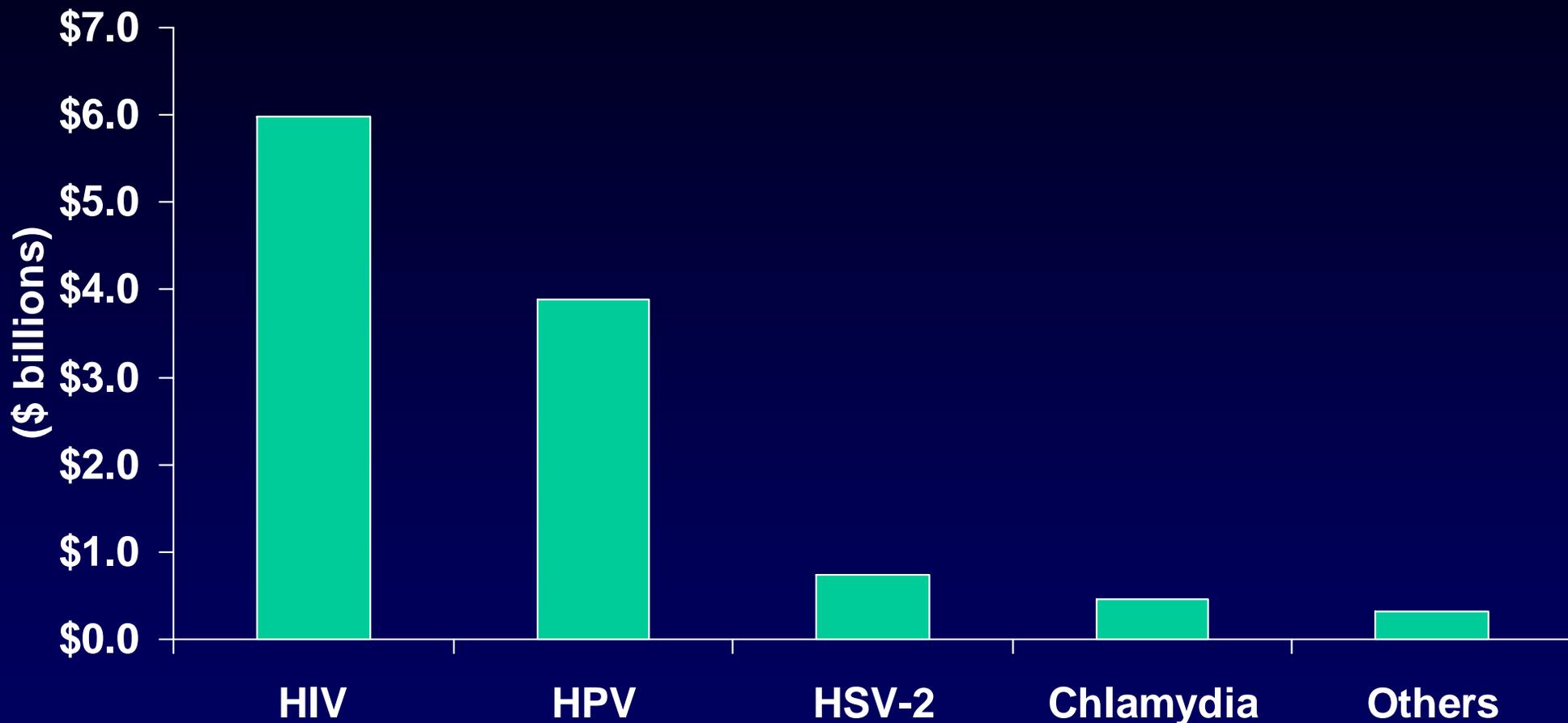
Modified from Hildesheim, A., National Cancer Institute

# Evaluation of an Abnormal Pap Test

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- ◆ Repeat cytology
- ◆ HPV DNA test
- ◆ Vaginal and cervical inspection
- ◆ Colposcopy with directed biopsy
- ◆ Endocervical curettage
- ◆ Bimanual pelvic examination

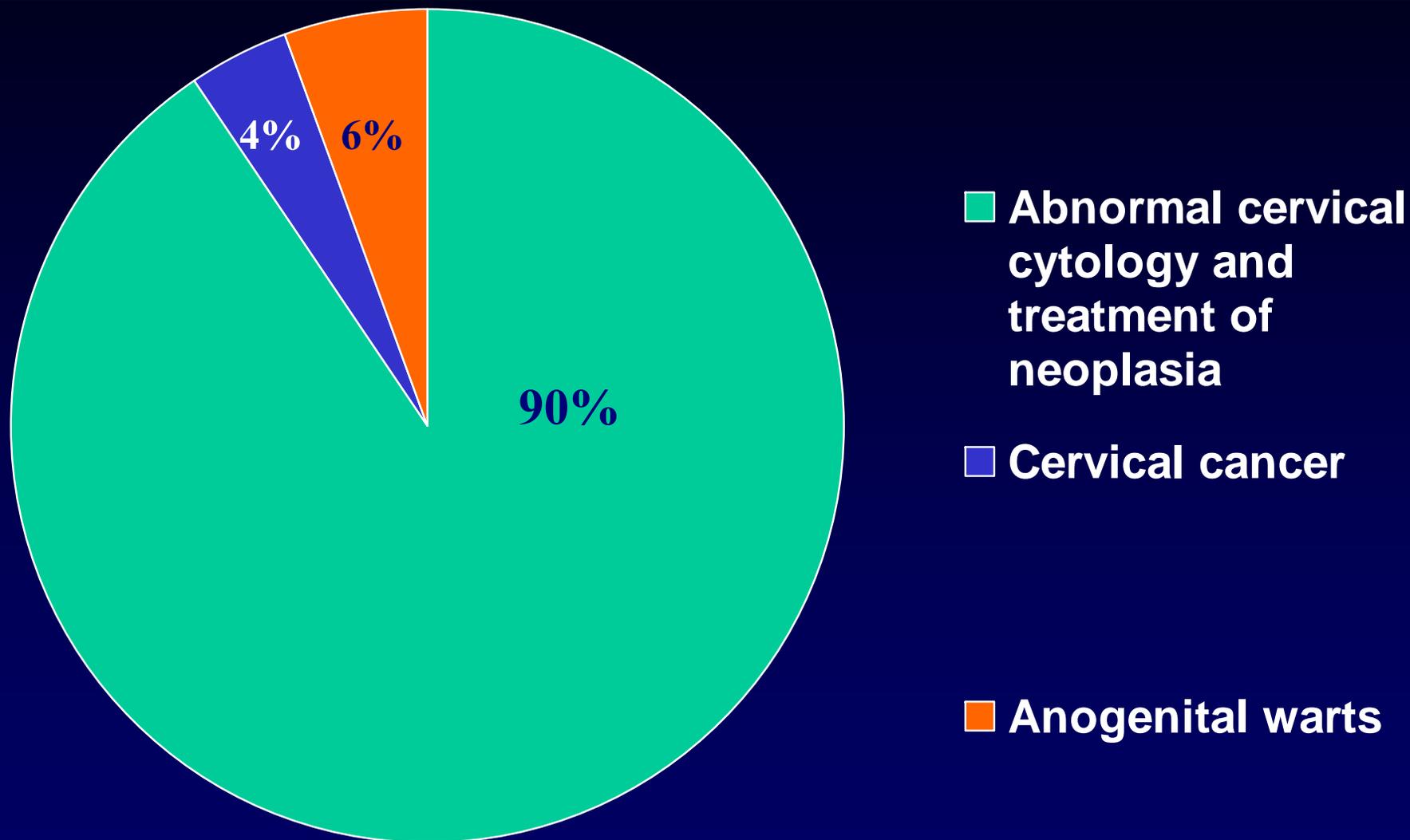
# Estimated Annual Direct Medical Cost of Specific Sexually Transmitted Infections, U.S., 2000



**Based on estimated incidence rates in 2000, in 2000 \$US**

Modified from Chesson et al. Perspectives on Sexual and Reproductive Health 2004, 36(1): 11-19  
Weinstock et al. Perspectives on Sexual and Reproductive Health 2004, 36(1): 6-10.

# Components of Total Cost Burden of HPV, U.S., 2000



Modified from Chesson et al. Perspectives on Sexual and Reproductive Health 2004, 36(1): 11-19)

# Summary

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- ◆ **Cervix Ca is the 11<sup>th</sup> most common cancer in U.S. women; occurs mainly among rarely or never screened**
- ◆ **9,710 new cancer cases and 3,700 cancer deaths estimated in 2006**
- ◆ **There are racial and socioeconomic disparities in cervical cancer incidence and mortality rates**
- ◆ **Cervical cancer screening has resulted in a 75% decrease in cervical cancer incidence in the U.S.**
- ◆ **Survival is high among women detected with early stage disease**
- ◆ **Cost of screening and managing results of abnormal Pap tests is in excess of \$4 billion per year**

# Acknowledgement

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