Cervical Cancer: A Global Crisis of Access

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Disclaimer & Disclosures

• No conflicts of interest.
Objective

1. Incidence of Cervical Cancer
2. Review Screening Recommendations
3. Discuss relationship of HPV to Cervical Cancer
4. Expand on reasons why we still have a “cervical cancer problem” on this planet
Burden is High and Growing and Inequitable

- 528,000 new cases reported annually
- 266,000 women die annually\(^1\)
- Disproportionate Burden in Low & Middle-Income Countries (LMIC) (85\%)\(^2-4\)
- LMICS only have 5% of global health resources
- Women in developing countries are twice as likely to die from cervical cancer than in the US

85% of cervical cancer cases occur in the developing world
Cervical Cancer Globally

Cervical cancer – disparities in mortality from a preventable disease
(Map shows countries sized by number of cervical cancer deaths. Numbers represent age-standardized mortality rates.)

United States
2.4 per 100,000

Uganda – 44.4 per 100,000
Tanzania – 54 per 100,000
Malawi – 75.9 per 100,000
Swaziland – 53.1 per 100,000

Siegel et al, CA Cancer J Clin, 2014
Globocan 2012 (WHO/IARC)
Cervical Cancer Incidence in Developed Countries has fallen dramatically since 1975.
Cervical Cancer in the US

**United States:**
- 11\textsuperscript{th} most frequent cancer among women
  - 12,000 new cases and 4,000 related deaths per year

- We spend $6.5 \text{ billion/year}$ on screening and management of pre-invasive disease

- High cervical cancer cancer rates among underserved women who don’t get screening

↑ Louisiana rate differs significantly from U.S. (SEER) rate (p<0.05).

Invasive cases only. All rates are age-adjusted to the U.S. 2000 standard population.
Cervical Cancer
Death by State, 2009–2013

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All rates are age-adjusted to the U.S. 2000 standard population.

12,000+ Cases and 4,000+ Deaths Every Year
Inequities here at home

Cervical Cancer Incidence and Mortality Rates by Race/Ethnicity, 2008-2012

- Total: Incidence 7.7, Mortality 2.3
- White: Incidence 7.7, Mortality 2.1
- Black: Incidence 9.2, Mortality 4
- Hispanic: Incidence 9.9, Mortality 2.7
- Asian/Pacific Islander: Incidence 6.3, Mortality 1.8
- American Indian / Alaska Native: Incidence 7.5, Mortality 3.5
HPV is a necessary cause of cervical cancer – 99.7%.

Cancer causing Types\(^1,2,4\):
- HPV 16
- HPV 18

Non-cancer causing types\(^1,2\):
- HPV 6
- HPV 11

- >75% of Cervical Cancer\(^5,6\)
- >50% of Vaginal & Vulvar Cancer\(^5\)

90% of Anogenital warts\(^5\)
Multi-Step Components of Cervical Cancer Screening Program

- PAP/HPV Test center/facility/supplies
- Cytologist
- Colposcopist/VIA specialist-colposcope
- Leep/Cryotherapy-supplies
- Pathologist
- Surgical oncologist
- Radiation oncologist
- Medical oncologist
Availability of Pathologist

Number of People per Pathologist:
- UK: 15,108*
- US: 19,232**

*Royal College of Pathologists, 2012
**Anatomic and Clinical Pathologists, AAMC, 2007

Adesina et al., Lancet Oncology, 2012
See or Screen and Treat

• **See and Treat:** two visits instead of the three visits [first a screening visit, second colposcopy and directed biopsy—and third treatment of confirmed CIN] using Pap screening

• ‘See-and-treat’ electrosurgical loop excision of cervical transformation zone enables simultaneous histologic diagnosis and treatment of cervical precancerous lesions, & eliminates need for cervical punch biopsy and additional visit.

• **Screen and Treat:** a single visit following VIA/VILI screening with immediate colposcopy and treatment with LEEP or cryotherapy.
Visual Inspection w/ Acetic Acid (VIA)

- Low cost
- Performed by Primary Health Workers
- 31% decrease in cervical ca mortality
- False positive lead to overtreatment, increased cost and patient concern
- Not acceptable to many middle and higher resource areas

Shastri et al., JNCI, 2014
Cervical cancer prevention programs are very affordable.

Estimated annual average cost (in USD) per capita of a comprehensive cervical cancer prevention program in the ten countries with the highest estimated age-standardized cervical cancer mortality rate (world) in 2012.
HPV Vaccination: The Basis of Cancer Control

9vHPV Vaccine

• Could prevent 90% of cervical cancers, 90% of vulvar/vaginal cancers, and 70–85% of high-grade cervical disease in women
• Could prevent 90% of HPV-related anal cancers and genital warts in men and women
• Efficacy >95% in the per-protocol population, the prevention of CIN grade 2 or worse caused by HPV 31, 33, 45, 52, and 58, and for 6-month persistent infection.
GAVI ALLIANCE TACKLES CERVICAL CANCER

Every year, 275,000 women die of cervical cancer. Over 85% of those deaths are in developing countries.

- Changing the Balance
  - Developing Countries
  - High-income Countries
  - GAVI’s support for HPV vaccines will help redress the inequity, delivering vaccines to countries with the highest burden.

- About HPV Vaccine
  - Safe and effective, human papillomavirus (HPV) vaccines protect against 70% of cervical cancer.

- Lowering the Price
  - Current lowest public price: US$13
  - In wealthy countries, the same vaccines can cost more than US$100
  - Price achieved by GAVI: US$4.50
  - The new low price of US$4.50 per dose marks a two-thirds reduction on the current lowest public sector price.

- Dramatic Acceleration
  - By 2020, over 30 million girls in more than 40 countries will be vaccinated against HPV
  - The first GAVI-supported HPV vaccines will be delivered in May 2013.
World Wide

• GAVI supporting the HPV vaccines in Kenya
  – will be supporting vaccination in Ghana, Lao PDR, Madagascar, Malawi, Niger, Sierra Leone and the United Republic of Tanzania.

• UNICEF + GAVI Alliance via a public tender process and will now purchase HPV vaccines from Merck & Co. at US$ 4.50 per dose and from GlaxoSmithKline at US$ 4.60 per dose for the award period, 2013-2017
  – Additionally, Merck has agreed to extend significantly lower prices to GAVI if total volumes increase in the future.
  – The same vaccine can cost more than $100 in developed countries
Healthy People 2020 goal is 80%

Combined boys/girls HPV vaccination rate = 56% for one shot

Females 63% one dose  42% three doses
Males 50% one dose  28% three doses
Annual Deaths From HPV-Related Cancers in US/Texas, 2012-2014

- Whooping cough
- Meningitis
- Anal cancer
- Oropharyngeal cancer
- Cervical cancer

Deaths in US:
- 20
- 150
- 880
- 2540
- 4030

Deaths in Texas:
- 20
- 48
- 63
- 204
- 357
We have come a far way but...

No woman should die of cervical cancer
Screening leads to fewer deaths

Cervical cancer deaths per 100,000 women

We can do better.

SOURCE: National Cancer Institute, 2014
THANK YOU