Population Effectiveness of HPV Vaccination on Cervical Cancer Prevention in the U.S.

Project #3
Cosette M. Wheeler, Ph.D. - Leader

Woman-based informatics program that captures all events and outcomes of a US population-based cervical screening program to define implementation and effectiveness of primary (vaccine) and secondary (Pap & HPV tests) HPV interventions
Timeline Effect of HPV Vaccination on Cervical Cancer: The Promise of Global Cervical-Cancer Prevention

Schiffman and Castle. *NEJM*. 2005
New Mexico HPV Pap Registry
NMHPVPR

A partnership of local, national and federal organizations, agencies and content experts.
7 NMAC 4.3.12 – Notifiable Diseases and Conditions 4/15/06 and 4/15/09 Mandated Reporting

- Title: Health
- Chapter 4: Disease Control (Epidemiology)
- Part 3: Control of Disease and Conditions of Public Health Significance

- Laboratories report the following tests to designee:
  - Papanicolaou test results (all results)
  - Cervical, vulvar and vaginal pathology results (all results)
  - HPV test results (all results)
~610,000 women base
Reporting is 99% EMR,
95% all NM residents screening

Includes labs outside of NM representing <20% of all tests

National Labs
- Quest
- Ameripath
- Labcorp
- ARUP

Texas Labs
- CDD
- Cytolabs
- Mattison
New Mexico HPV Pap Registry
Data Flow Diagram

Santa Fe
Las Cruces
Roswell
Albuquerque
Rio Rancho
Carlsbad
Farmington
Gallup

State-wide, Regional and National Lab Reporting

NM-SEER
NM-SIIS

Internet

Application Server

Staging Database

Production Database

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare

Health Plans Medicare
MEMORANDUM OF AGREEMENT BETWEEN THE UNIVERSITY OF NEW MEXICO HEALTH SCIENCES CENTER AND THE NEW MEXICO DEPARTMENT OF HEALTH

WHEREAS the UNM-HSC has shown local, national and international leadership through its Center for Infectious Diseases and Immunity (CIDI) in the primary and secondary prevention of human papillomavirus (HPV) infections and their related diseases;

NOW THEREFORE:

The NM-DOH and UNM-HSC agree to the following:

1. The UNM-HSC shall act as the NM-DOH authorized designee to receive reports of notifiable conditions on behalf of the NM-DOH for the purpose of public health surveillance of HPV as set forth in NMAC 7.4.3 versions April 15, 2006 and 2009.

2. The New Mexico HPV Pap Registry (NMHPVPR) is located at 1816 Sigma Chi Rd NE, Albuquerque, NM 87106 and the phone numbers for contacting the NMHPVPR are (505) 272-5785 or (505) 277-0266.

3. The NMHPVPR is governed as outlined in Appendix 1 by an expert Steering Committee established in 2007. The NMHPVPR Steering Committee is responsible for developing new policies and making changes in all standing policies for the Registry, enforcing policy as needed, reviewing and approving research proposals, reviewing all requests for funding related to projects proposing to utilize the registry and other duties as assigned.
UNM-IHPC Project #3 - Aims

Aim 1: To establish overall and HPV genotype-specific incidence rates of cervical intraepithelial neoplasia (CIN) in the screened population as a baseline to which future cohorts with increasing proportions of HPV vaccinated women can be compared.

Aim 2: To define the impact of HPV vaccination on the population-based incidence of CIN.

Aim 3: To delineate the impact of HPV vaccination on HPV genotype frequency as an early measure of HPV vaccine effectiveness.

Aim 4: To define cervical screening practices and effectiveness in the NM population over the time period 2006-2013 and to reveal any changes potentially related to HPV vaccine uptake.
Number of Pap Tests by Age 2006-2007
Number of Days Between Pap and Biopsy All New Mexico Labs by Cytologic Diagnosis Pap Test in 2006, Biopsies through 2007

Cumulative Percent

Days to Biopsy

Cumulative Percent

Days to Biopsy

0 30 60 90 120 150 180 210 240 270 300 330 360
HPV Viral Ecology Surveillance Research Component

• **Population-based HPV type-specific testing**
  – IRB approved health research
  – Designed to precisely detect changes in HPV type-specific prevalence and impact on disease outcomes pre- and post-vaccination

• ~20,000 liquid cytology samples/month
  – Honest broker de-identified
  – Target (≤30yrs)
    • 30,000 normal randomly sampled
    • 10,000 abnormal
  – Target (all ages)
    • 4,000 CIN1 and 4,000 CIN2/3
## HPV Genotyping Study
### New Mexico State-Wide Population Baseline

<table>
<thead>
<tr>
<th>Age</th>
<th>Pap Diagnosis</th>
<th>Total Pap Tests&lt;sup&gt;1&lt;/sup&gt;</th>
<th>In Study Labs&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Specimens Selected&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Specimens Located&lt;sup&gt;4&lt;/sup&gt;</th>
<th>HPV Genotyping&lt;sup&gt;5&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>&lt;=30</td>
<td>Abnormal</td>
<td>17785</td>
<td>13769 (77%)</td>
<td>13668 (77%)</td>
<td>12397 (70%)</td>
<td>10881 (61%)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>109449</td>
<td>79568 (73%)</td>
<td>37571 (34%)</td>
<td>34422 (31%)</td>
<td>29037 (27%)</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>Abnormal</td>
<td>13298</td>
<td>11144 (84%)</td>
<td>11063 (83%)</td>
<td>9865 (74%)</td>
<td>8644 (65%)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>216634</td>
<td>177240 (82%)</td>
<td>13242 (6%)</td>
<td>12384 (6%)</td>
<td>11994 (5%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>357166</td>
<td>281721 (79%)</td>
<td>75544 (21%)</td>
<td>69068 (19%)</td>
<td>60556 (17%)</td>
</tr>
</tbody>
</table>
Project # 3 Directions and Opportunities for Collaboration

• Model laboratory-based medical informatics program enabling comparative effectiveness of US cervical screening and HPV vaccination amenable to implementation in other settings
  • Defines real-world clinical practice and impact of interventions vs. guidelines and “expected”
  • Teaches natural language parsing of dictated text diagnoses
  • Allows geospatial mapping and targeting of disparities
• Population-based cervical sample and data resource is amenable to other IRB approved research use and biorepository could be used to assess other STIs