Up to 50% of Cancers May Be Preventable through Health Behavior Change

- Tobacco – up to 30%
- Overweight & Obesity – up to 20%
- Diet – up to 5%
- Sedentary Behavior – up to 5%
- Viral Exposure (e.g., HPV) – up to 5%
- Alcohol Consumption – up to 4%
- Sun/Ionizing Radiation – up to 2%

CANCER RISK FACTORS

Adapted from the American Association for Cancer Research Cancer Progress Report 2014

AACR Cancer Progress Report 2017
Colditz & Wei, Annu Rev Public Health 2012
Colditz, Wolin & Gehlert, Sci Transl Med 2012
Wolin, Carson & Colditz, Oncologist 2010
Smoking rates have declined over the past 25+ years in the U.S.…. but smoking prevalence remains high worldwide, especially in men in low & middle income countries.
The effect of the decline in smoking on cancer "has been somewhat counterbalanced by this steady rise in obesity trends beginning in the ‘70s...."

"Who would’ve thought we’d ever see the day where what you eat (and) exercise, could account for more cancer deaths than smoking?"

-- Richard Wender, MD, Chief Cancer Control Officer, American Cancer Society
Obesity is increasing in prevalence world-wide

A Hefty Increase
In 1980, 857 million people were overweight or obese; that number rose to 2.1 billion people in 2013, a study shows.

Global obesity rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Adults</th>
<th>Children and adolescents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>12%</td>
<td>4%</td>
</tr>
<tr>
<td>1990</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>2000</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>2010</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>2013</td>
<td>12%</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

Top 10 countries ranked by number of obese people in 2013, in millions

<table>
<thead>
<tr>
<th>Country</th>
<th>Obese People</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>86.9</td>
</tr>
<tr>
<td>China</td>
<td>62.0</td>
</tr>
<tr>
<td>India</td>
<td>40.4</td>
</tr>
<tr>
<td>Russia</td>
<td>29.2</td>
</tr>
<tr>
<td>Brazil</td>
<td>26.2</td>
</tr>
<tr>
<td>Mexico</td>
<td>24.9</td>
</tr>
<tr>
<td>Egypt</td>
<td>21.8</td>
</tr>
<tr>
<td>Germany</td>
<td>17.1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>16.7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Source: Institute for Health Metrics and Evaluation

The Cancer Atlas

Linked to 13 different types of cancer
Physical inactivity and certain dietary factors have been linked to cancer.

<table>
<thead>
<tr>
<th>PHYSICAL ACTIVITY</th>
<th>DECREASED RISK OF CANCER</th>
<th>INCREASED RISK OF CANCER</th>
</tr>
</thead>
</table>
| Colon             | &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;
UV radiation exposures and skin cancer

In the U.S. melanoma incidence rates are rising while mortality rates are stable....

In some countries, melanoma rates show signs of decreasing in younger males....

...but continue to increase among older males....

Adopting a healthy lifestyle is the exception, not the norm

- Less than 5% of adults participate in 30 minutes of physical activity each day (USDA, 2010) & only one in three adults receive the recommended amount of physical activity each week (DHHS, 2010)

- Typical American diets exceed the recommended intake levels or limits in four categories: calories from solid fats and added sugars, refined grains, sodium, and saturated fat (USDA, 2010)

- Only 7.7% of US adults practice a combination of 5 healthy behaviors: not smoking, >5 fruits & vegetables/day, adherence to recommended amounts of physical activity, sleep, and alcohol use (Adams et al., 2013)
Even when we are successful in changing behavior...

...long-term maintenance is difficult.

Trials of Hypertension Prevention II:
Weight loss over 36 months in 2382 overweight pre-hypertensives.
What is needed?

A multi-level, translational framework for understanding & improving cancer-related health behaviors
Tobacco control efforts have involved interventions at multiple levels – from the individual through policy & environmental control.
Achieving long-term behavior change requires research at all levels of analysis

...to better understand individual variation

...to develop & rigorously evaluate behavioral interventions...

...and to inform the design of health-promoting policies & environments
## Sample Current Funding Opportunities for Behavioral Intervention Research

### Funding Opportunities

<table>
<thead>
<tr>
<th>Opportunity Description</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stimulating Innovations in Behavioral Intervention Research for Cancer Prevention and Control</strong>&lt;br&gt;<strong>PAR-18-018 (R21 (CTO))</strong>&lt;br&gt;Foreign Institutions Eligible</td>
<td>Tanya Agurs-Collins</td>
</tr>
<tr>
<td><strong>Testing Interventions for Health-Enhancing Physical Activity</strong>&lt;br&gt;<strong>PAR-18-324 (R01 (CTO)) PAR-18-307 (R21/R33 (CTO))</strong></td>
<td>Frank Perna</td>
</tr>
<tr>
<td><strong>Population Health Intervention: Integrating Individual and Group Level Evidence</strong>&lt;br&gt;<strong>PAR-18-385 (R01 (CTO)) PAR-18-407 (R21 (CTO))</strong>&lt;br&gt;Foreign Institutions Eligible</td>
<td>David Berrigan</td>
</tr>
<tr>
<td><strong>Physical Activity and Weight Control Interventions Among Cancer Survivors:</strong>&lt;br&gt;<strong>Effects of Biomarkers of Prognosis and Survival</strong>&lt;br&gt;<strong>PAR-18-893 (R01 (CTO)) PAR-18-892 (R21 (CTO))</strong>&lt;br&gt;Foreign Institutions Eligible</td>
<td>Frank Perna</td>
</tr>
</tbody>
</table>

NATIONAL CANCER INSTITUTE
Disclosures:

Dr. Paskett is the Multiple PI on a grant from the Merck Foundation related to patient navigation.

Her work in Appalachia is also partially supported by a philanthropic gift to the Ohio State University from FoxConn Electronics, Taiwan.
Community-Based Cancer Prevention in the Eastern United States

Addressing Cancer Health Disparities Using Behavior Change Approaches

Electra D. Paskett, Ph.D
Ohio State University, Columbus, OH, USA
Overview of Disparities in the Eastern United States

A Mokdad, JAMA, 2017
Appalachian Area of the United States

- Appalachia consists of 420 counties in 13 states
- 5 regions: Northern, North Central, Central, South Central and Southern
- Appalachian Regional Commission defined in 1965 in response to region’s deficits
- 24.8 million residents (about 8% of total U.S. population)
- Higher rates of poverty and lower rates of higher education
- Poor health behaviors and lack of health care resources
Challenges to Addressing Disparities in Rural Areas

Definition of “rural” and recognition as an underserved population

Access
- Quality care: prevention, screening, follow-up, treatment, supportive, survivorship, end of life
- Resources to support health lifestyle: food deserts, lack of PA options, tobacco access is pervasive
- Technology: cell phone and internet service as well as hardware

Poor Knowledge and Beliefs
- Providers
- Public

Everyday Life
- Crime, low SES, environmental contaminants, cultural norms

Low Research Capabilities
- Full scale protocol-driven research
- Monitoring
Health in Appalachian Ohio

**Health Factors**
health behaviors, clinical care, social and economic, and physical environment factors

**Health Outcomes**
how long people live and how healthy people feel while alive

Source: 2018 County Health Rankings Report, A Robert Wood Johnson Foundation Program
In Appalachia…

“We don’t talk about cancer.”
Breast Cancer Disparities in Appalachian Ohio

Six counties have no mammography facilities

- higher stage of diagnosis for breast cancer

We developed a program of Continuum of Care Patient Navigation to address this disparity

- Integrate several behavioral theories
- Social Determinants of Health, Social Support, Health Behavior Model

*Female Breast Cancer: Proportion (%) of Cases Diagnosed Late (Regional & Distant) Stage by County of Residence in Ohio, 2010-2014
Breast Health Connection (BHC) Program

Community Health Workers:
• Work in community to educate and find women in need of screening
• Introduce women to Patient Navigator

Mobile Mammogram Van:
• Available to provide mammograms

Navigator:
• Assesses where woman is to get screened
• Qualifies woman for coverage
• Identifies and addresses barriers
• Schedules appointment
• Reminds woman of appointment
• Provides follow-up for abnormality
BHC - Breast Health Education to Screening

Breast Health Education
Conduct breast health education and invite attendees to schedule a mammogram.

- Attendee schedules a mobile mammography appointment at the educational session:
  - No show or cancelled
    - Rescheduled
    - Had mammogram
  - Had mammogram
- Primary care provider and patient will be contacted via letter with the results of the mammogram.
  - If the results are abnormal, PN will follow-up with patient.

- Attendee unable to schedule completes a contact card. CH-W will call attendee at a later date:
  - Mobile Unit
    - No show or cancelled
      - Rescheduled
      - Had mammogram
  - Refer to PN to assist in finding a local mammography facility
    - Local Facility
      - Had mammogram
      - Rescheduled
      - Had mammogram

- Attendee unable to schedule and do not want to complete contact card, will take flyer with project phone number:
  - If the attendee calls, the PN will schedule an appointment on the mobile or assist in locating a local mammography facility:
    - Mobile Unit
      - No show or cancelled
      - Had mammogram
      - Rescheduled
      - Had mammogram

*Notification of results from non-OSU facilities will be dependent upon the practice of the mammography facility.
Today is the day
to schedule your mammogram.

Early Detection Saves Lives!
Get Your Mammogram!

Wednesday, March 28th, 2018
9:30 a.m. - 3:30 p.m.

Hocking County Health Department
350 State Route 664N
Logan, Ohio

FREE mammograms can be provided for women age 40 and over who are uninsured or underinsured and meet certain income guidelines.

Call to find out if you qualify and to schedule your mammogram!

Ohio State University
Breast Health Connection Project
Samantha Harris
844-384-PINK (7465)
**BHC – Continuum of Care**

**Woman with Breast Abnormality or Abnormal Screening Result**

- **BHC Patient Navigator** will conduct an assessment to find out barriers to obtaining diagnostic care.
  - Provide education and referrals to resources to address identified barriers to diagnostic care.
  - Ensure women have received the results of their diagnostic care and check to see if they have any questions or concerns.
  - PN provides contact information for any future breast health needs or additional assistance needed.

- **BHC PN will provide information on possible locations for diagnostic care and find out patient’s preference.**
  - Coordinate diagnostic care at the Stefanie Spielman Breast Center.
  - Connect to diagnostic care at local hospital and work closely with hospital staff/navigator.
  - BHC PN will work closely with staff at chosen location to ensure diagnostic care is received and the patient and Primary Care Physician have received results.
Results to Date – Appalachian Ohio

Number of women reached with education: 270
Number of mammograms scheduled: 875
Number of mammograms completed: 741
Number of abnormal mammograms requiring follow-up: 91 (11 lost to follow-up)
Number of cancers detected: 4 (1 Stage 0; 1 Stage II; 2 Stage IV)
Conclusions

Disparities in cancer outcomes can be addressed through:
• Understanding causes of disparities
• Realizing and addressing the culture and beliefs of populations
• Including behavioral theories, customized to the communities
• Exploring innovative ways to reach populations
• Using patient navigation combined with outreach workers

Evaluation of efforts is important to determine the need for course corrections and assess progress
Acknowledgements

Funding: Susan G. Komen Columbus
Samantha Harris, Patient Navigator
Thank you for your attention!

Contact: Electra.Paskett@osumc.edu
Behavior Change Interventions in Cancer Control: Reviewing Evidence and Research Priorities

Sudha Sivaram, DrPH, MPH
Chief, Public Health Networks and Research Branch
Center for Global Health
## A Deaths

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Deaths Attributable to Individual Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Blood Pressure</td>
<td><img src="image1" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Smoking and Secondhand Smoke</td>
<td><img src="image2" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Diets Low in Fruits</td>
<td><img src="image3" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>High BMI</td>
<td><img src="image4" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>High Blood Glucose</td>
<td><img src="image5" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Physical Inactivity and Low</td>
<td><img src="image6" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Physical Activity</td>
<td><img src="image7" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>High Dietary Salt</td>
<td><img src="image8" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Alcohol Use</td>
<td><img src="image9" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Diets Low in Nuts and Seeds</td>
<td><img src="image10" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>High Serum Cholesterol</td>
<td><img src="image11" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Diets Low in Vegetables</td>
<td><img src="image12" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Diets Low in Whole Grains</td>
<td><img src="image13" alt="Deaths Graph" /></td>
</tr>
<tr>
<td>Diets Low in Fish and Seafood</td>
<td><img src="image14" alt="Deaths Graph" /></td>
</tr>
</tbody>
</table>

### Figure 1. Determinants of Health and Their Contribution to Premature Death.

Adapted from McGinnis et al.\textsuperscript{10}

- Genetic predisposition: 30%
- Behavioral patterns: 40%
- Environmental exposure: 5%
- Health care: 10%
- Social circumstances: 15%
Session Outline

- Review of behavioral risk factors for cancer – Dr. Susan Czajkowski
- Interventions that have shown promise – Dr. Electra Paskett
  - Addressing disparities
  - Understanding and involving community based resources
  - Utilizing mass media, mobile and ehealth for cancer education and screening
- Behavior Change is not sufficient by itself – Need to address the experience of cancer health disparities and policy context – Dr. Safurah
Meet the Experts
National Cancer Institute

Wednesday, 3 Oct
Exhibit Booth #E17-18

Behavioral Research
10:00 - 11:00

Implementation Science Research
11:00 - 11:30

Susan Czajkowski  Bill Klein  Sudha Sivaram
Behavior Change Interventions in Cancer Control: Reviewing Evidence and Research Priorities”

HPV Vaccination in Malaysia

Assoc Prof Dr. Safurah Jaafar
Consultant Public Health Physician
International Medical University
The response and uptake of pap smear for Cervical Cancer Screening by the Malaysian female population was very low despite more than three decades of implementation. With the availability of the HPV vaccination supported by findings of its cost-effectiveness, the commitment to slowly reduce the incidence of cervical cancer which is now accepted as largely preventable, was taken up by the country. The introduction of the HPV immunisation as a new program adopted the ‘health-belief model’ to initiate behaviour modification. The aim is to create awareness on the benefits, clarify the various barriers to gain acceptance on the threat of the disease, with resulting change of behaviour to getting the immunisation. Capitalising on the high utilisation of the social media, the approach taken went beyond the conventional print and main stream media through the wider involvement of the face book, Instagram and twitters. The response towards the new programme was very encouraging. Indebted to the vigorous promotional campaigns, strategic alliances and collaboration of several sectors, the HPV immunisation recorded an unprecedented high coverage after the first year of implementation. This paper will share how and what were the challenges in creating the behaviour change towards greater acceptance of the HPV Immunisation and Cervical Cancer Control programme in Malaysia.
Pap smear uptake

Last Pap smear Examination – NHMS III, 2006

- Within last 3 years: 60%
- More than 3 years: 40%

Comparison of ‘Pap smear within last 3 years’

NHMS2: 74.5
NHMS 3: 59.7

Source: NHMS 3, 2006, MOH
Factors affecting cervical smear screening:

4. Cervical screening services available nationwide but uptake rates were only 26% in 1996 and 43.7% in 2006.

5. **Program design factor**: opportunistic rather than ‘population-base approach’,
   **Target population factors**: lack of knowledge about the disease and screening test, perceived absence of risk of cancer and emotional factors, were amongst the common barriers to good screening uptake in Malaysia.
Why HPV vaccination?

Cervix, Uteri stage at diagnosis among Malaysian citizen 2008

Stage 1: 24%
Stage 2: 38%
Stage 3: 21%
Stage 4: 17%

Why HPV vaccination become part of Cervical Cancer strategy?
- Low Cervical smear uptake among high risk women
- Delay in seeking treatment
- WHO endorsed on safe HPV vaccine to prevent Ca Cx

<table>
<thead>
<tr>
<th>Budget/Target</th>
<th>Ca Cervix</th>
<th>HPV Vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,627 cases (2003)</td>
<td>266,000 girls (2009)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost</th>
<th>RM 381.8 millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM 2.8 millions for pre invasive</td>
<td></td>
</tr>
<tr>
<td>RM 285 millions for treating new cases (invasive)</td>
<td></td>
</tr>
<tr>
<td>RM 94 millions for treating old cases</td>
<td></td>
</tr>
<tr>
<td>RM 322.2 millions</td>
<td></td>
</tr>
<tr>
<td>Vaccine RM 319.2 million</td>
<td></td>
</tr>
<tr>
<td>Additional Cost RM 3 millions (Health Education, Training and logistic)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost/person</th>
<th>RM 234,665.02</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM 1,211.28</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Incidence</th>
<th>19.7 /100,000 women-unchanged</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/1,000,000 (estimate vaccine efficacy at 98%)</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1USD = RM3.44 in 2007

Aljunid, 2007. HUKM
Decision Making and Planning

2006
- Family Health Development Division (Women Health)
- Disease Control Division (Cancer Unit)
- Proposal for introduction of HPV vaccination as Cervical Cancer Preventive Measures

2007 - 2009
- Disease Control Division
- (Vaccine preventable disease unit)
- Approval of vaccine use in Malaysia by National Vaccine Policy and Implementation Committee
- Cabinet Approval to finance HPV vaccination
- Vaccine procurement
- Pharmaceutical Division
- Licencing HPV vaccine into Malaysian market
- Monitor AEFI

2010 onwards
- Family Health Development Division (School Health)
- Execution of HPV vaccination policy
- Health Education Division
- Risk communication strategy

MOH DRIVEN INITIATIVE

Source: MOH, Malaysia
GOAL: To reduce the incidence of Cervical Cancer related to HPV type 16 and 18 infection among immunized 13 years old girls over next 20 years.

OPERATIONAL POLICY: Free Voluntary School Based HPV Vaccination to Form 1 Malaysian girls

STRATEGY: delivered as part of the Cervical Cancer Prevention and Control Program and the Expended Program of Immunization (EPI)

Key strategies

Single type of vaccine utilization during one procurement cycle
- 2010/11 : Cervarix
- 2012 – 2016 : Gardasil
- Schedule : 0, 1, 6 month
- Shifted to 2 doses in 2015 (0, 6 month)

• High school attendants in Malaysia
• HPV vaccine as an additional vaccination to existing EPI program
• Availability of structured comprehensive school health program
• Strong commitment and support from Ministry of Education

Source: MOH, Malaysia
# Health Behaviour Intervention

## Health Belief Model

<table>
<thead>
<tr>
<th>The elements</th>
<th>The Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived susceptibility</td>
<td>• Cancer risks (<em>Promiscuity</em>)</td>
</tr>
</tbody>
</table>
| Perceived benefits   | • Protection against Cancer  
                       | • Given only (3) then (2) doses only                                    |
|                      | • Given free and at site                                                 |
| Perceived barriers   | • Consent by parents  
                       | • New vaccine                                                          |
|                      | • Vaccine halal                                                         |
|                      | • Vaccine safety                                                        |
|                      | • Immunisation procedures                                               |
| Perceived seriousness | • Cancer threats                                                        |
# Health Behaviour Intervention

## Health Belief Model

| Modifying variables | • Knowledge  
|                     | • Transparent, credible, and timely communication on issues such as Halal requirements and AEFI. |
| Cues to action      | • Engagement rather than advocacy: parents were treated as partners in the exercise and had convenient and simple access to authorities to resolve issues  
|                     | • Consent forms with education pamphlet  
|                     | • Peer acceptance  
| Self-efficacy       | • Protection against risk of cancer |
### Communication Strategies

**Theme: HPV Vaccine as Cervical Cancer Vaccine**

<table>
<thead>
<tr>
<th>Media Campaign Based on Health Belief Model</th>
<th>Public Access to Interactive Information</th>
<th>Rumours Surveillance and Program Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cervical cancer is preventable</td>
<td>1. Social Media</td>
<td>1. Response to media and public queries</td>
</tr>
<tr>
<td>2. Parental awareness on voluntary vaccination</td>
<td>- HPV Facebook</td>
<td>2. Provide guideline to implementers</td>
</tr>
<tr>
<td>3. Persuade girls to complete 2 doses of vaccination as scheduled</td>
<td>2. Phone Hot line</td>
<td>3. Monitor potential program threat and proposed counter measures</td>
</tr>
<tr>
<td></td>
<td>3. Email</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Print and electronic advertisement</td>
<td>4. Adverse Event FI</td>
</tr>
</tbody>
</table>

**Addressing the religious and cultural aspect of the HPV vaccination**

Leading to establishment of Fatwa or religious ruling on HPV vaccination for the Muslim.

*Source: MOH, Malaysia*
Structured multi-component communication strategy

- Actively recruited beneficiaries and their immediate influencers
- Provided sufficient resources to ensure widespread coverage
- Use of diverse media channels for a range of target audiences
- Teachers most influential on student behaviour, briefings were designed for teachers and heads of schools.
- Parents recruited as active partners in the programme through interactive social media.
- MoH using social media responded to parental fears or questions with personalised medical or operational advice in a timely manner, thereby enabling them to make informed decisions.
- Rumour surveillance mechanism, provided real time reassurances against negative publicity arising from any part of the world.
- Supportive environment: implementation/supply side and in terms of public need and demand.

Source: MOH, Malaysia
Thank you
Program target: completion at 95%

Malaysian HPV Vaccination Coverage 2010 to 2015

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dose of Vaccine Delivered</td>
<td>689,490</td>
<td>679,924</td>
<td>692,530</td>
<td>728,604</td>
<td>677,120</td>
<td>440,708</td>
</tr>
<tr>
<td>No of AEFI Report received</td>
<td>414</td>
<td>2992</td>
<td>947</td>
<td>947</td>
<td>745</td>
<td>793</td>
</tr>
<tr>
<td>%</td>
<td>0.06 %</td>
<td>0.44 %</td>
<td>0.26 %</td>
<td>0.13 %</td>
<td>0.11 %</td>
<td>0.18 %</td>
</tr>
</tbody>
</table>

Source: MOH, Malaysia
Factors Contributing to Success

1. Political Will and commitment
2. Public trust in Malaysian Expanded Program in Immunisation
3. School Health Services Infrastructure
4. Existing strong relationship with Ministry of Education
5. Effective Risk Communication Strategy
6. Addressing Religious Issues
7. Competitive Procurement Mechanism
acknowledgements

• Dr Saidatul Norbaya
• Ms Azila Azmi
• Ministry of Health Malaysia
CEGAH KANSER SERVIK MELALUI PELALIAN HPV