Objective: Cervical cancers are the second highest incidence of female cancers in Malaysia, causing high impact on nation’s health cost and patient’s quality of life that can be avoided by better screening and HPV vaccination.

Methods: This is a cross sectional study done from 2006-2009 and respondents were interviewed from six public hospitals. Methods include expert panel discussions to estimate treatment costs and respondents’ interviews using cost and SF-36 quality of life (QOL) questionnaires. Three programs were compared i.e., PAP smear screening (quadivalent HPV vaccination and combined strategy (screening plus vaccination).

Results: 502 cervical cancer patients participated in the study. Mean age was 53.3 ± 11.2 years, educated till secondary level (39.4%), Malays (44.3%) and married for 27.7 ± 12.3 years. Life years gained from vaccination is 13.04 years and average Quality Adjusted Life Years saved (QALYs) is 24.6 in vaccinated vs 8.2 in unvaccinated women. Cost/QALYs saved for PAP smear at base case is RM 1,214.90/QALYs and RM 1,100.01/QALYs at increased screening coverage. In HPV vaccination, base case is at RM 35,345.79/QALY and RM 46,530.08/QALYs when vaccination price is increased. In combined strategy, Cost/QALYs at base case is RM 11,288.58/QALY at best case and RM 14,583.72/QALY at worst case scenarios. Incremental cost-effectiveness ratio (ICER) showed that screening at 70% coverage or higher is highly cost effective at RM 986.47 per QALYs saved and this is followed by combined strategy at RM 35,345.67 per QALYs saved. Budget impact analysis indicated that it cost the government RM 180.4 million per year and 2.5% of the national budget.

Conclusions: Vaccination increase life expectancy with better QOL. Cost effective strategies will include increasing the Pap smear coverage to 70% or higher. Screening adherence and long term screening adherence is doubtful among Malaysian women; vaccination of young women is more cost effective against cervical cancer.


- Quality Adjusted Life Years - Cost of RP 200
- Sensitivity Analysis: RM 300-600
- No booster required
- Side effects not serious.
- PAP smear population coverage - 40 and 70%
- Mandatory Vaccinations
  - Administered at 15 years old
  - Plus catch up period from 9-26 years old Coverage 75%

- Incidence of Cervical Cancer Based on 19.710,000 female population (year 2003)
- Female population based on M’sia population statistic 2005.

Researches – Prof Dato’ Shafie Ayub
- Shafee Ismail
- Fuad Ismail
- Majidah Mohd
- Seri Suniza
- Sharifa Ezat Wan Puteh
- Prof Dato Syed Aljunid

Institutions – USM, Hospital Kuala Lumpur
- Hospital Sungai Buloh
- Hospital Alor Setar
- Hospital Kajang, Port Klang
- Hospital Sentul, Hospital Serdang
- Ministry of Health Malaysia

Cervical cancer women lower than normal women (higher QOL).

- Life Years Saved (LYS)
- Deaths Averted

Cost Effectiveness Model

Costs and Outcomes

- Cost of Vaccination Programme
- Cost of PAP Smear Programme
- Cost of Adverse Events of Vaccination
- Outcomes
  - Quality Adjusted Life Years (QALYS)
  - Life Years Saved (LYS)
  - Deaths Averted

Mean Cost (RM)/Patient by Cost Components

Table 1: Reference of QOL Score between Cancer Patients and General Population

Table 2: 3. Life Expectancy (in years) in Normal Women and Those with Cervical Cancer by Age Group

Life expectancy

- Overall, women without Cervical cancer live longer:
  - Average 28.84 life yrs.

- UFS in cervical cancer is estimated 13-14 yrs per case.

Methodology: Study Design

- Experts group discussion, development clinical pathway, sensitivity analysis
- Expert group discussion for Primary and Serious cancers.
- Step-down costing for the providers Cost
- Maco costing Questionnaires
  - Capital cost
  - Recurrent cost
  - Unculant (i.e., Unpredictable cost per individual patient
  - Program Cost-2°13 data and published information

Three Options

1. PAP smear screening only - base and worst case scenarios.
2. HPV Vaccinations - base and worst case scenarios.
3. Combined Strategy (HPV vaccination + Screening) - base, best and worst case scenarios.

ECONOMIC EVALUATION OF HUMAN PAPILLOMAVIRUS (HPV) VACCINATIONS IN THE PREVENTION OF CERVICAL CANCER

Wan Puteh SE (sh_ezat@yahoo.com)
National University of Malaysia, Kuala Lumpur Malaysia, Kuala Lumpur Mal, Malaysia


Table 3: Life Expectancy (in years) in Normal Women and Those with Cervical Cancer by Age Group

Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Life Expectancy (in years)</th>
<th>Life Years Saved (LYS)</th>
<th>Deaths Averted (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-24</td>
<td>49.87</td>
<td>48.18</td>
<td>70</td>
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<tr>
<td>25-29</td>
<td>55.10</td>
<td>53.35</td>
<td>75</td>
</tr>
<tr>
<td>30-34</td>
<td>59.72</td>
<td>57.97</td>
<td>80</td>
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<td>35-39</td>
<td>64.32</td>
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<td>85</td>
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<td>40-44</td>
<td>68.95</td>
<td>67.20</td>
<td>90</td>
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<tr>
<td>45-49</td>
<td>73.13</td>
<td>71.38</td>
<td>95</td>
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<td>50-54</td>
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<td>55-59</td>
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<td>83.85</td>
<td>110</td>
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<tr>
<td>65-69</td>
<td>89.80</td>
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<td>70-74</td>
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<tr>
<td>75-79</td>
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<tr>
<td>80-84</td>
<td>102.40</td>
<td>100.66</td>
<td>130</td>
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<tr>
<td>85-89</td>
<td>106.60</td>
<td>104.86</td>
<td>135</td>
</tr>
</tbody>
</table>

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  - Average 28.84 life yrs.

- UFS in cervical cancer is estimated 13-14 yrs per case.