Decisions about Pap tests: what influences women and providers?

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Cervical Cancer

• Cervical cancer is one of the most preventable and curable of all cancers
  – May take 10 or more years to develop
• Pap test allows for early detection and prevention
  – Regular cervical screening can prevent approximately 90% of cervical cancers
• Australia has a National Cervical Screening Program
  – Deaths from cervical cancer fell by 40% between 1986 and 1998
Role of provider/GP

- Most pap tests provided by GPs
- Interaction between provider and woman is important
- GP recommendations affect choices
  - When to have the test?
  - What type of test to have?

Screening program challenges and debates

- Screening interval
  - Current recommendation: all women aged 20-70 have a Pap test every 2 years
  - Every 3 years in UK, commonly every 1 year in US
- Role of new technologies
  - Liquid based tests, HPV testing
  - Aim to enhance the overall accuracy and value of screening
  - Liquid based tests most widely available adjunct technology in Australia
    - May be attractive to providers concerned about litigation
- Increasing participation rates
  - Use of incentives for practices
What information is needed?

- What affects women’s choices and provider’s recommendations?
- How the interaction between provider and woman affect choices?
- Are preferences of women and GPs similar?

Obtaining evidence to inform policy?

- Ideally, revealed preference (RP) data
  - Reality is that there are data deficiencies
- Stated preference data are good predictors of behaviour
  - Discrete Choice Experiments (DCE) are viable data source
  - Especially useful when little market or revealed preference (RP) data exists
    - New products/policies
    - GP/woman interaction difficult to capture with RP data
    - DCE provides approach to simulate interaction
DCE

- Stated preference surveys
  - Designed to simulate market based choices
  - Choose preferred alternative from series of hypothetical but realistic choice sets
  - Alternatives described in terms of attributes
- Experimental design principles used to choose choice sets to allow for efficient estimation
- Discrete choice analysis is used to model preferences from the generated data

Features of this choice experiment

- Independent samples of GPs & women
  - To examine interaction
    - Patient characteristics was included in the GP surveys, and vice versa
  - Decision making context was included
    - Common across all choice options
    - Ex: time since last test, recommended screening interval
- Attributes were identified from
  - Literature review
  - Current policy context for the NCSP
- Validated in a pilot study
Features

- Each survey included
  - 8 context attributes
  - 3 alternative specific (not generic) attributes
  - No recommendation/choice option
- Socio-demographic characteristics, woman’s screening and GP’s practice history, etc. were also collected

Attributes

<table>
<thead>
<tr>
<th>WOMEN</th>
<th>GPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to woman (4 levels)</td>
<td>Cost to woman (4 levels)</td>
</tr>
<tr>
<td>Accuracy – False Pos (4 levels)</td>
<td>Accuracy – False Pos (4 levels)</td>
</tr>
<tr>
<td>Accuracy – False Neg (4 levels)</td>
<td>Accuracy – False Neg (4 levels)</td>
</tr>
<tr>
<td>Recommended screening interval (4 levels)</td>
<td>Recommended screening interval (4 levels)</td>
</tr>
<tr>
<td>HPV test cost (4 levels)</td>
<td>HPV test cost (4 levels)</td>
</tr>
<tr>
<td>Time since Pap test (4 levels)</td>
<td>*Time since Pap test (4 levels)</td>
</tr>
<tr>
<td>Usual GP (2 levels)</td>
<td>Regular patient (4 levels)</td>
</tr>
<tr>
<td>Incentive for GP (2 levels)</td>
<td>PIP payment (4 levels)</td>
</tr>
<tr>
<td>Sex of GP (2 levels)</td>
<td>Why consulting (4 levels)</td>
</tr>
<tr>
<td>GP’s recommendation (4 levels)</td>
<td>Age of woman (5 levels)</td>
</tr>
<tr>
<td>HPV recommendation (2 levels)</td>
<td>Perceived h/hold income (4 levels)</td>
</tr>
</tbody>
</table>
Sample woman choice task

This GP is your regular GP who you usually see for most care, including Pap tests.

This GP is Female.

This GP’s practice will receive a special incentive payment if you have a Pap test at this visit. No.

About the tests available:

<table>
<thead>
<tr>
<th></th>
<th>Standard Pap test</th>
<th>Liquid based Pap test</th>
</tr>
</thead>
<tbody>
<tr>
<td>The out of pocket costs to you for this test will be</td>
<td>$0</td>
<td>$20</td>
</tr>
<tr>
<td>The chance that this test will give you a false negative result is</td>
<td>1 in 20</td>
<td>1 in 33</td>
</tr>
<tr>
<td>The chance that this test will give you a false positive result is</td>
<td>1 in 1000</td>
<td>1 in 500</td>
</tr>
</tbody>
</table>

Other information the GP gives you about cervical screening:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The GP tells you that you had your last Pap test about 1 year ago.</td>
<td>The national recommendation is that women should have a Pap test every 1 year.</td>
</tr>
<tr>
<td>If you have either Pap test you can at the same time have an HPV test at an additional out-of-pocket cost to you of $50.</td>
<td>If the patient has a Pap test at this consultation, your practice will receive a standard consultation fee and an incentive payment if the patient has a Pap test at the recommended screening interval.</td>
</tr>
<tr>
<td>The GP recommends that you do not have a Pap test at this visit.</td>
<td>At the same time that the patient has a Pap test it is possible for her to have an HPV test at an additional cost of $150.</td>
</tr>
</tbody>
</table>

Three choices: 1) I would not have a cervical cancer screening test, 2) I would have a standard Pap test, 3) I would have the liquid based Pap test.

Sample GP choice task

About this patient:

This patient is attending the consultation for a minor health problem.

This patient is a patient who has previously consulted your practice but has not consulted you.

This patient last had a Pap test about 3 years ago.

This patient is aged Less than 20.

In your perception this patient is in the middle income/SES range.

About the tests available:

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<td>The out of pocket costs to the patient for this test will be</td>
<td>$0</td>
<td>$20</td>
</tr>
<tr>
<td>The chance that this test will give a false negative result is</td>
<td>1 in 10</td>
<td>1 in 10</td>
</tr>
<tr>
<td>The chance that this test will give a false positive result is</td>
<td>1 in 150</td>
<td>1 in 100</td>
</tr>
</tbody>
</table>

Other information about cervical screening:

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The national recommendation is that women should have a Pap test every 3 years.</td>
<td>If the patient has a Pap test at this consultation, your practice will receive a standard consultation fee and an incentive payment if the patient has a Pap test at the recommended screening interval.</td>
</tr>
<tr>
<td>At the same time that the patient has a Pap test it is possible for her to have an HPV test at an additional cost of $150.</td>
<td>At the same time that the patient has a Pap test it is possible for her to have an HPV test at an additional cost of $150.</td>
</tr>
</tbody>
</table>

Three choices: 1) I would not recommend the patient have a cervical cancer screening test at this consultation, 2) I would recommend the patient have a standard Pap test at this consultation, 3) I would recommend the patient have a liquid based Pap test at this consultation.
Data collection

- Random sample of 167 women aged 18-69
  - Door to door recruitment in NSW
  - All previously had screening test
  - Each respondent completed 32 scenarios
  - 5344 choice observations
- Sample of 215 GPs
  - Sampled from AMA contact list for GPs in NSW
  - Each respondent completed 32 scenarios
  - 6880 choice observations

Choice frequencies

<table>
<thead>
<tr>
<th></th>
<th>WOMEN</th>
<th>GPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Pap test</td>
<td>39%</td>
<td>32%</td>
</tr>
<tr>
<td>Liquid-based Pap test</td>
<td>24%</td>
<td>25%</td>
</tr>
<tr>
<td>No test</td>
<td>37%</td>
<td>43%</td>
</tr>
</tbody>
</table>
Analysis

- Mixed Logit (MXL), MNL with random coefficients
- Only intercepts are random
  - Common way of capturing heterogeneity
  - Account for possible dependence structure in unobserved utility among the repeated choices of an individual
- Socio-demographic var: Age, gender, education, income, practice history, etc.

Analysis

- Our intercept specification induces correlation between standard and liquid based test choices
  - Allows better and more realistic substitution patterns
Results

- MXL represents significant improvement in fit over MNL
- Coefficient estimates have sensible signs
- Results of the intercept estimates in MXL imply substantial heterogeneity across respondents
  - Less variability in GP recommendations

Results: Context attributes

- Both responsive to the nationally recommended screening interval
- More likely to test/recommend the longer the interval since last test
- Their choice not affected by whether doctor receive incentive payments
- Women less likely to test if the GP was male or not their regular GP
- Women follow doctor’s recommendation
- GPs more likely to recommend if the patient was not a regular patient of the GP
- Overall GPs seem more likely to screen very young women and less likely to screen older women
Results: Other variables

- Intercept estimates suggest less preference for liquid based test
- All alternative specific attributes were significant and had expected signs
- Socio-demographic variables generally not significant for women
- GPs less likely to recommend screening if practiced for <1 year

Comparison of effects for women & GPs

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Estimates</th>
<th></th>
<th>Ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GP</td>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>False negative</td>
<td>-0.06</td>
<td>-0.03</td>
<td>0.55</td>
</tr>
<tr>
<td>False positive</td>
<td>-0.35</td>
<td>-0.45</td>
<td>1.30</td>
</tr>
<tr>
<td>Cost</td>
<td>-0.01</td>
<td>-0.03</td>
<td>1.99</td>
</tr>
<tr>
<td>Interval 1 yr</td>
<td>0.40</td>
<td>0.41</td>
<td>1.02</td>
</tr>
<tr>
<td>Interval 3 yrs</td>
<td>-0.76</td>
<td>-0.42</td>
<td>0.55</td>
</tr>
<tr>
<td>Interval 5 yrs</td>
<td>-1.61</td>
<td>-1.08</td>
<td>0.67</td>
</tr>
<tr>
<td>Last test 2 yrs</td>
<td>1.73</td>
<td>1.11</td>
<td>0.64</td>
</tr>
<tr>
<td>Last test 3 yrs</td>
<td>2.80</td>
<td>1.43</td>
<td>0.51</td>
</tr>
</tbody>
</table>
Explaination

- Considerable commonality in preferences
  - Women exhibit more heterogeneity in their choices
- However, women put relatively more weight on cost, chance of a false positive and if the recommended screening interval is one year
  - GP’s recommend on basis of perceived best interests of patients as they may be better informed
- Overall doctor working as a good agent for patient

Policy implications

- Recommended interval
  - Women and GPs will follow recommendation
- Opportunistic screening
  - Can be used to increase screening rate
  - Encourage GPs to recommend screening even when the woman is attending for another reason
  - Encourage new doctors to recommend test
- Liquid-based tests
  - Less preferred over standard test
- Incentives
  - DCE not suitable?
Next steps

• Survey distinguished between women on basis of test history
  – Differences in preferences?
• Attitudes towards HPV test
• Introduction of HPV vaccine
  – Have rerun women’s survey