

**Costello Medical Consulting Limited**

St John's Innovation Centre

Cowley Road

Cambridge, CB4 0WS

United Kingdom

[www.costellomedical.com](http://www.costellomedical.com)



# Review of ISPOR 15th Annual International Meeting 2010



## Review of ISPOR 15th Annual International Meeting 2010

- ISPOR promotes high quality health economics and outcomes research and facilitates the translation of this information for decision-makers
- The main themes of interest discussed at the ISPOR 15<sup>th</sup> International Meeting were personalised medicine, adaptive clinical trials and the importance of patient reported outcomes
- Research specific to the field of depression focussed upon the importance of adherence to treatment, predictors for personalised medicine, the impact of the FDA black box warning on prescribing patterns and the introduction of an escitalopram generic in Poland
- Research of interest on Alzheimer's disease (AD) included the study of caregiver burden, predictors for personalised medicine and the progression of dementia in AD compared to non-AD dementia
- For Parkinson's disease (PD), two posters of interest were a systematic review of economic analyses involving rasagiline and entacapone and an evaluation of the cross-cultural use of the PDQ-8 health survey
- Research specific to the field of haematological malignancy focussed upon 'real-life' resource use associated with oncology drugs. Of note, the impacts of administration route and adverse event profile on costs were presented.
- Research specific to the field of vaccination focussed upon developments within pneumococcal and influenza vaccines and the adoption of vaccination schemes across the United States.

Costello Medical Consulting Ltd. attended the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 15<sup>th</sup> Annual International Meeting that took place in Atlanta, USA on 15<sup>th</sup>-19<sup>th</sup> May 2010.

The meeting was titled "*From Adaptive Trials to Personalised Medicine: Providing Value for Decision Makers*," and we believe that some of the research presented may be of interest to you.

Some of the main themes that were discussed throughout ISPOR are presented below. This provides an overview of some of the most controversial or cutting-edge areas of research set to make an increasing impact upon the field of pharmaceuticals in the near future.

During the congress, we also collected research posters that we had previously identified as being directly related to certain disease areas: depression, Alzheimer's disease (AD), Parkinson's disease (PD), haematological malignancies and vaccination. A summary of these posters is provided below.

### Personalised Medicine

- A central theme at the congress was personalised medicine and strategies to identify persons who will benefit most from therapy.
- The limitations and challenges associated with biomarkers from the physician, manufacturer and payer perspectives were highlighted. The need for more robust research into how personalised medicine strategies affect true clinical practice was highlighted.
- A point that was given particular emphasis was that personalised medicine does not only involve genetic tests, but incorporates any diagnostic tool that can identify those patients who would or would not respond to particular therapy.

### Adaptive Clinical Trials

- Adaptive clinical trials, where the structure of the trial is pre-specified to adapt in accordance to accumulated knowledge, are currently being hailed as the solution to the problem of too-long trials and too-low success rates.
- Adaptive clinical trials are applicable to all disease areas, as the possible adaptations can be tailored to the specific clinical question. Example adaptations include stopping the trial early to avoid futility, selecting appropriate sub-populations and changing sample size to efficiently accomplish objectives.

### Patient Reported Outcomes

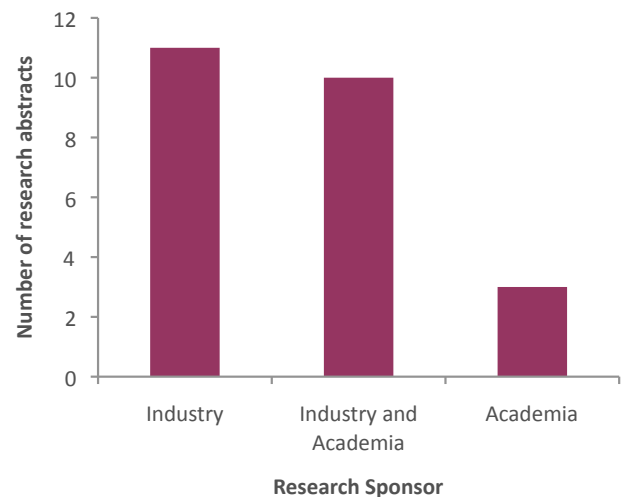
- There is ongoing interest in patient reported outcomes (PROs) and there was considerable input from the FDA on how to design and validate useful PRO tools.
- There was particular emphasis on the utility of PROs at every stage of the regulatory process:
  - As primary endpoints in registration trials
  - As secondary endpoints in registration trials for label claims
  - Patient preference measures/utilities in pharmacoeconomic models
  - Conjoint analysis of patient surveys for trading off risks for benefits

### Depression

We identified 23 posters and 1 oral presentation on the subject of depression. For depression, there were a greater number of industry sponsored studies than academic (Figure 1).

From the research relating to depression, we have identified four areas of interest. The importance of adherence to treatment, predictors of medication usage, the impact of the FDA black box warning on prescribing patterns and the introduction of an escitalopram generic in Poland.

Figure 1. Depression



### Adherence to Treatment

Adherence to treatment for depression is obviously a major issue, as four posters focussed on this topic. The first poster described below is of particular interest as it provides evidence for decreased adherence to therapy in patients who are switched to a generic version of their prescribed branded drug or a different drug in the same class. Also of particular note is the relationship between increased adherence to therapy and reduced healthcare costs, as investigated by the second poster described below.

- A research team in the US sponsored by Forest Laboratories Inc. investigated the effect on treatment adherence of equivalent and non-equivalent substitution in depression and anxiety disorder, where the brand version of a drug is substituted for the equivalent generic version or a generic version of a different drug in the same therapeutic class, respectively.<sup>1</sup> Measured by the Morisky scale, the adherence of patients who had been switched was significantly worse than for patients who had always received their prescribed

medication. The reasons for this non-compliance after switching are likely due to the concerns raised over substitution: Of those anxious/depressed patients who had experienced switching, 52.3% were uncertain over efficacy, 51.5% worried that the health insurance company would not know what was best for the patient and 47.8% were concerned that it was not what the doctor had prescribed to them. This problem of medication compliance after switching could lead to worse clinical outcomes and compromise cost savings.

- One study assessed the relationship between adherence to duloxetine and healthcare costs.<sup>2</sup> It found that longer adherence to medication resulted in significantly decreased overall healthcare costs ( $p=0.02$ ), despite increased pharmacy costs.
- A collaboration between Eli Lilly and an academic group investigated the adherence (medication possession ratio  $\geq 0.8$ ) and persistence (length of therapy without exceeding a 15-day gap) with various therapies for major depressive disorder. Using claims data from commercially-insured patients, individuals were grouped into four mutually exclusive cohorts (duloxetine, venlafaxine, escitalopram, or generic SSRIs); a major limitation of this study was that patients who were initiated on more than one medication were grouped into the first medication that they received, which may lead to an underestimation in adherence for drugs that are more frequently initiated as adjunctive therapy. It was reported that over a one year period, patients taking duloxetine had significantly greater adherence and persistence to therapy compared to those taking venlafaxine, escitalopram or generic SSRIs ( $p<0.01$ ).<sup>3</sup> The venlafaxine treatment group had greater adherence and persistence than escitalopram or generic SSRIs ( $p<0.01$ ) and escitalopram had similar adherence and persistence to generic SSRIs.
- An academic group in Texas, USA, examined the patient adherence to antidepressant therapy in a population of low-income adults who were randomised to receive either usual standard of care or an intervention that included accelerated medical and psychiatric services and case management support.<sup>4</sup> Higher adherence rates were observed in the intervention groups versus the control group, highlighting the importance of this type of support for uninsured working adults.

## Predictors of Medication Usage

Several studies investigated predictor characteristics of patients that use pharmacotherapy, psychotherapy or both, or patients that go on to take a high-dose of antidepressant.

- A group from the University of Arkansas reported that patient age, overall health status and mental health status were significant predictors of the type of therapy

received by the patient.<sup>5</sup> Patients in the age group 46-65 years were nearly twice as likely to receive pharmacotherapy alone than combined therapy ( $p=0.0009$ ) and half as likely as younger people to receive psychotherapy alone ( $p=0.007$ ). Patients with poor physical and mental health status were less likely to get psychotherapy than combined therapy.

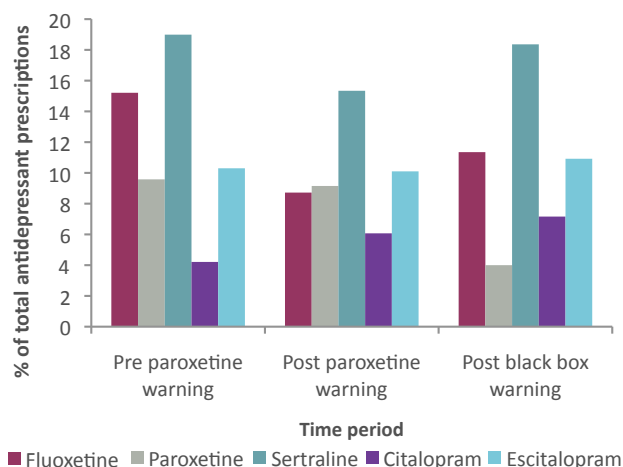
- A collaboration between Eli Lilly and an academic group demonstrated that multiple demographic and clinical characteristics were associated with a high dose prescription of duloxetine: prior use of certain antidepressants and antipsychotics, physician speciality (psychiatric vs. non-psychiatrist), older age and various comorbidities.<sup>6</sup>

## Impact of the FDA Black Box Warning on Prescribing Patterns

In 2003, the FDA warned against the use of paroxetine in children or adolescents with depression. This was followed, in 2004, by the addition of a black box warning to the labels of all antidepressants regarding the risk of suicidality among children and adolescents. Two posters investigated the impact of this black box warning on prescribing patterns. Both groups used the same source of information, the National Ambulatory Medical Care Survey.

- Both studies found that the number of overall antidepressants prescribed for paediatric patients decreased after the introduction of the black box warning, as did the total number of visits with a diagnosis for depression.<sup>7,8</sup>
- The studies disagreed upon whether fluoxetine prescriptions significantly increased or not after the black box warning.<sup>7,8</sup>
- One study reported the prescription pattern for citalopram and escitalopram: there was an increase in paediatric prescriptions for citalopram after the FDA warnings, but the proportion of prescriptions for escitalopram remained relatively constant (Figure 1).<sup>8</sup>

Figure 2: Frequencies (by percentage of total paediatric antidepressant prescriptions) of leading SSRIs before and after the paroxetine and black box warnings (adapted from Kale et al. 2010, PMH85)



## Impact of Generic Escitalopram in Poland

The Arcana Institute in Poland presented three posters on an escitalopram generic, two of which were economic analyses and one was a clinical study. The research was funded by Adamed, a Polish company who want to gain reimbursement status for their escitalopram generic, Mozarin®.

- A budget impact analysis considered two alternative scenarios where the generic version of escitalopram did or did not gain reimbursement status in Poland.<sup>9</sup> They estimated that reimbursement of escitalopram would produce savings from the patient's perspective, but would actually increase expenses for the Polish National Health Fund.
- A cost-minimisation analysis compared generic escitalopram to sertraline and venlafaxine from a payer and societal perspective in Poland with a 6 month time horizon.<sup>10</sup> From both perspectives, generic escitalopram was comparable in cost to sertraline, but less expensive than venlafaxine for the treatment of major depressive disorder.
- The clinical study compared generic escitalopram to sertraline and venlafaxine.<sup>11</sup> It was concluded that generic escitalopram had an equivalent efficacy and safety profile to the comparator drugs.

## Alzheimer's Disease (AD)

We identified 9 posters and oral 1 presentation on AD.

### Caregiver Burden

There were a number of posters relating to the caregiver burden associated with AD, which highlights the importance of this aspect of the overall disease burden.

- A commercial group assessed the association between perceived caregiver burden and health related quality of life scores. They presented results showing that perceived caregiver burden is associated primarily with deficits in the mental component scores and that more severe AD has a greater impact on caregivers' quality of life.<sup>12</sup>
- Another group investigated the potential cost savings if AD was able to be prevented or delayed in the future. They found significant cost-savings for caregivers under this scenario.<sup>13</sup>
- When the spouses of AD patients were matched to those of non-AD patients in the US, it was reported that there was no change in healthcare costs or utilisation for the spouse after the diagnosis of AD for the patient. As this was contrary to what was expected, the authors concluded that the burden on the spouse may begin before the diagnosis of AD is made or that the 1 year timeframe was not long enough to capture the long-term burden.

## Predictors of Medication Usage

In accordance with the theme of personalised medicine, one academic group researched the predictors for patients taking anticholinergic medication for dementia. They found the predisposing factor of age and the developed factors of behavioural symptoms, activities of daily living and depression were all positively associated with low activity anticholinergic therapy.<sup>14</sup>

## Progression of Dementia

Authors from the University of Washington followed over 3000 dementia patients, around half of which had AD, to see how the presence of AD affected the development of the dementia. They found that AD patients were quicker to progress to a stage that required institutionalisation, but that non-AD dementia patients were actually more likely to die.<sup>15</sup> The medical reasons behind this are unclear.

The fact that time to institutionalisation is obviously an important issue in AD supports the research conducted by Lundbeck, which found that memantine significantly increases the time to nursing home admission for AD patients.<sup>16</sup>

## Parkinson's Disease (PD)

We identified 4 posters relating to PD.

A group from Duquesne University in the US performed a systematic review of economic analyses of rasagiline and entacapone in PD. From the identification of five studies (1 on rasagiline, 3 on entacapone, 1 on both), they concluded that although entacapone may be associated with higher effectiveness in terms of QALY gain, rasagiline provides a valuable therapeutic alternative with no additional cost to society.<sup>17</sup> This conclusion was made despite the fact that the one study that directly compared rasagiline to entacapone (Hudry et al. 2006<sup>18</sup>) found that rasagiline actually had a higher QALY gain compared to entacapone (0.13 vs. 0.12).<sup>17</sup>

Another interesting research poster on PD presented data on the cross-cultural use of the short-form PDQ-8 health survey. The authors applied factor analytical procedures to data collected from the USA, Canada, Spain, Italy and Japan. They concluded that results from this tool can legitimately be compared across countries.<sup>19</sup>

## Haematological Malignancies

We identified 24 posters and 1 presentation on the subject of haematological malignancy. The majority were either commercially sponsored or a collaboration between industry and academia, rather than purely academic studies (Figure 3). Leukaemia, multiple myeloma and lymphoma were all covered. There were no posters specifically on acute myeloid leukaemia (Figure 4).

Figure 3: Industry sponsored vs. academic studies

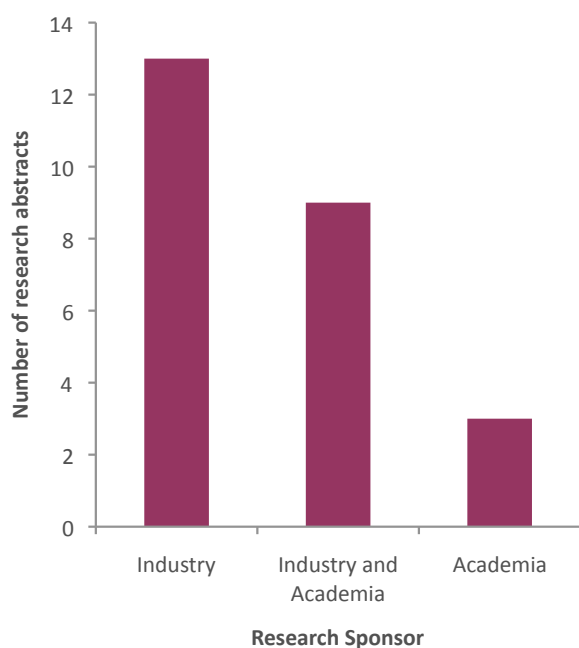
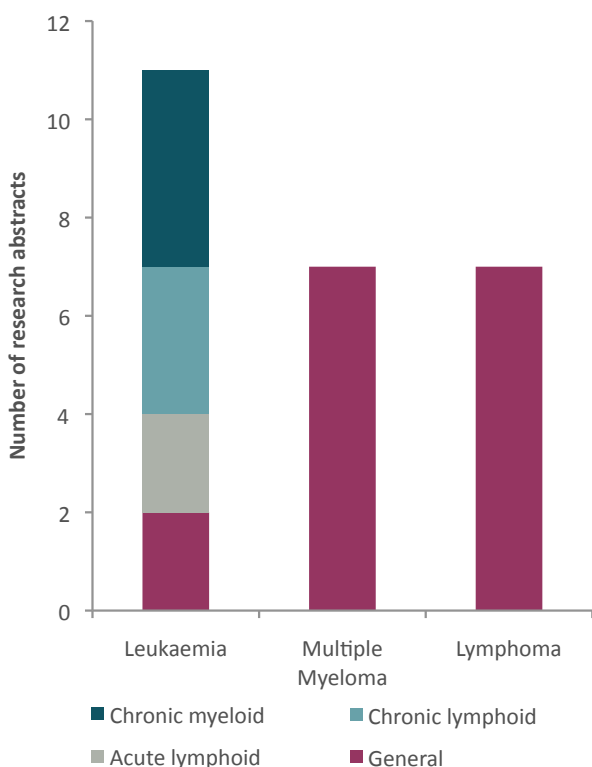


Figure 4: Number of studies by disease area



There were many cost-effectiveness evaluations presented at ISPOR in this field, where the key cost driver was consistently identified as the drug acquisition cost. In addition, there were a considerable number of posters reporting the evaluation of 'real-life' resource utilisation incurred by drugs for haematological malignancies. Other themes that we identified of potential interest to you are outlined below.

### Administration

Several posters considered themes related to drug administration. Although oral therapies were identified as having some benefits over intravenous (IV) or subcutaneous therapies, such as increased patient convenience and decreased infusion/injection-related adverse events, there was disagreement as to whether there was also an economic benefit.

- A retrospective review of claims data from a large US commercial health plan assessed both the healthcare utilisation and the out-of-pocket cost for patients with multiple myeloma.<sup>20</sup> The out-of-pocket cost to the patients was found to be very high, being significantly higher in oral therapies (REVLIMID® and THALOMID®) compared to IV VELCADE®.
- On the other hand, a literature review reported decreased total healthcare costs with the oral form of fludarabine for chronic lymphocytic leukaemia compared to the original intravenous form, as well as increased patient convenience and elimination of infusion-related adverse events.<sup>21</sup>

### Adverse Events as a Key Cost-Effectiveness Driver

Several analyses report the beneficial adverse event of profile of a drug as a key driver for improved cost-effectiveness. A group from Novartis presented two posters at ISPOR relating to this topic:

- It was reported that the 'real-life' healthcare utilisation for the management of nilotinib related adverse events in chronic myeloid leukaemia was significantly lower than that estimated from the adverse event profile of the drug in its product information.<sup>22</sup>
- The group also reported that the total healthcare resource utilisation incurred with nilotinib was significantly lower than that for its competitor dasatinib. This reduction in healthcare costs was attributed to the better adverse event profile of nilotinib.<sup>23</sup>

### Adherence

The Novartis researchers looked into how the adherence to imatinib affected healthcare costs; interestingly they reported that being non-adherent to imatinib within any 3 month period increases a patient's total healthcare costs by \$1,477 in this period.<sup>24</sup> This results in total cost savings in the first 3 years for fully

adherent patients of \$24,168. The issue of adherence-related healthcare costs also relates to the subject of administration, as oral oncology therapies have been found to be less well adhered to than IV ones.<sup>25</sup>

### Varying Guidelines across Countries

Treatment patterns in four Nordic countries (Norway, Denmark, Finland and Sweden) for the treatment of multiple myeloma were compared by the Swedish Institute for Health Economics.<sup>26</sup>

- Differences were found in the time spent on 1<sup>st</sup> line treatment (Norway 18 months; Finland 7 months) and the share of patients continuing to 2<sup>nd</sup> or 3<sup>rd</sup> line treatments (Norway 38% and 22%; Finland 89% and 72%, respectively).
- Additionally, there were differences in the introduction of thalidomide, bortezomib and lenalidomide.

This highlights the importance of ensuring appropriate positioning on treatment guidelines for optimal market access.

### Vaccination

We identified 15 posters and 2 presentations on the subject of vaccination. The majority were either commercially sponsored or a collaboration between industry and academia, rather than purely academic studies (Figure 5). There were a considerable number of abstracts on pneumococcal conjugate vaccines and the influenza vaccines, which must reflect the high rate of research activity that is currently occurring in these two areas (Figure 6).

Figure 5: Industry sponsored vs. academic studies

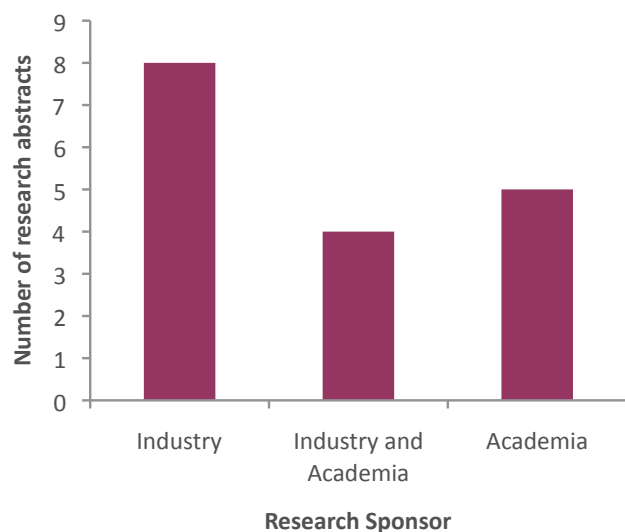
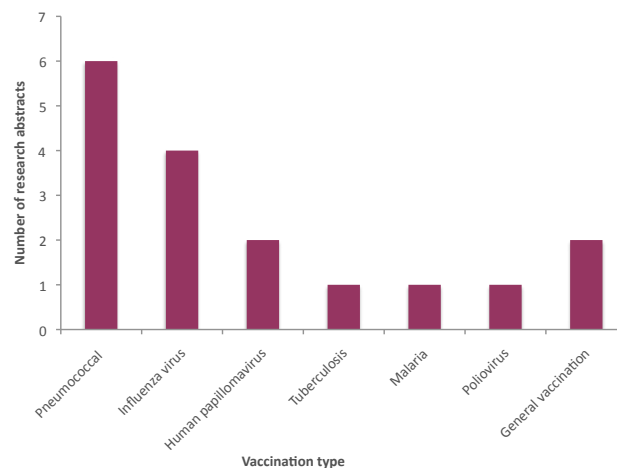


Figure 6: Number of studies by vaccination type



### Pneumococcal Vaccines

Five of the six research abstracts presented on the topic of pneumococcal vaccination were in reaction to the recent launch of Wyeth's 13-valent pneumococcal conjugate vaccine (PCV13), which will largely replace their 7-valent vaccine (PCV7) and will pose a major market access barrier for GSK Biologicals' 10-valent vaccine (PCV10). Four of these research presentations were sponsored by Wyeth and one by GSK Biologicals.

- The focus of the Wyeth-sponsored research was on the newly emerged markets of Singapore, Hong Kong and Brazil, whereas GSK Biologicals focussed upon the specific reduction of acute otitis media in Canada.
- Three independent groups were sponsored by Wyeth to investigate the clinical and economic impact of PCV13 in Hong Kong. Two of these groups also investigated the impact in Singapore.
  - A commercial group modelled the impact of PCV13 in an influenza pandemic, as historical data suggests that most pandemic-related deaths are actually caused by pneumococcal disease.<sup>27</sup> They reported that the introduction of PCV13 vaccination, compared to no vaccination, would result in cost-savings in Hong Kong and be cost-effective in Singapore (incremental cost-effectiveness ratio (ICER) of ~\$100 per quality-adjusted life year (QALY) gained).
  - The other groups, one a consultancy and the other an academic group, investigated the cost-effectiveness of PCV13 under current conditions. Both posters agreed that PCV13 dominates PCV7 in terms of cost-effectiveness in Hong Kong.<sup>28,29</sup>
  - One of these two groups went on to compare PCV13 to PCV10 and also considered the situation in Singapore.<sup>29</sup> They reported that

in all situations PCV13 dominates PCV10 in terms of cost-effectiveness. In addition to the direct effects of PCV10 and 13, which were estimated from those of PCV7, this research team also took into consideration the indirect effects ('herd' effects due to reduced nasopharyngeal carriage in immunised individuals); the indirect effects for PCV13 were assumed to be equivalent to those of PCV7 as they share the same carrier molecule. No indirect effects were applied for PCV10, as they claimed none had yet been published.

- The final Wyeth-sponsored research team performed similar analyses for the Brazilian market.<sup>30</sup> They concluded that PCV13 would be cost-effective compared to PCV10, but would not introduce cost-savings at the current purchase prices (ICER of R\$3976 per life year gained).

## Influenza Vaccines

Following the threat of the H1N1 pandemic, several posters concentrated on the financial impact of various influenza immunisation strategies in the US.

- An academic group led by the University of Michigan modelled the cost-effectiveness of vaccination specifically for the 2009 H1N1 outbreak, using a societal perspective.<sup>31</sup> When undertaken before the start of the modelled outbreak, vaccination affords cost-savings when only persons between 6 months and 64 years with high risk conditions are vaccinated. The vaccination of those without high risk conditions was found to incur costs, at a cost-effectiveness ratio of \$8000-\$52,000 per QALY depending on age and risk category. The cost-effectiveness ratio also increases dramatically if vaccination is initiated after the tenth week of a hypothetical H1N1 epidemic.
- A commercial group investigated a similar scenario.<sup>32</sup> In this model, costs were limited to vaccine acquisition and therefore costs were found to be incurred in all situations. The most cost-effective vaccination strategy was found to be to vaccinate everyone under twenty years old (\$12 per infection avoided) and the least was to vaccinate those over sixty (\$29.50 per infection avoided).
- Another commercial group investigated the cost-effectiveness of universal influenza vaccination in the US.<sup>33</sup> In contradiction to the first poster, this group estimated that this strategy would dominate the current policy of targeted vaccination for select age and risk groups; it would cost \$3 billion less and avert 2 million cases of flu, which would result in a gain of 31,000 QALYs.

A further poster on the subject of influenza vaccine, whose audience included healthcare providers and vaccine developers, investigated whether children's

preferences for influenza vaccine could be measured accurately using conjoint analysis.<sup>34</sup> They reported that children over eight years of age could understand conjoint tasks and consider multiple attributes simultaneously; their preferences on mode and efficacy should therefore be taken into account during vaccine development and deployment. This links back to one of the main ISPOR themes, that of patient reported outcomes, and highlights how tools such as conjoint analysis can be important in the field of vaccination.

## Adoption of Vaccination Across the US

Similar to the economic models produced for influenza vaccines, one poster modelled the cost-effectiveness of an adult immunisation schedule in the US.<sup>35</sup> The 7-vaccine schedule for children has been shown to provide immense health benefits at a significant cost-saving, but adult immunisation has up until now only been investigated on an individual vaccine basis. The authors found that an adult immunisation routine would be cost-effective, although would not result in cost-savings; the ICERs for all populations fall below £20,000 per QALY gained. By initiating the schedule only for people over 65 years of age, the lowest ICER of \$5000 is obtained.

Two posters reported current adoption across the US of human papilloma virus (HPV) vaccination for protection against cervical cancer. Although national guidelines recommend that physicians should offer HPV vaccination to all females aged 11-26 years, there is currently an issue with uptake. Research into the adoption profile of the vaccine could allow manufacturers and healthcare decision makers to identify at-risk populations that are not receiving or taking up the offer of vaccination.

- A group from the University of Houston performed a retrospective cross-sectional analysis of 2007-2008 National Survey data.<sup>36</sup> They discovered that only 1 in 4 girls aged 11-17 were actually recommended the vaccine and only 14.5% initiated the vaccine. Children in households with two or more adults and those living above the federal poverty level were less likely to commence the HPV vaccine.
- A consultancy company used 2008 vaccination rate data and 2004 census data to estimate how HPV vaccination rates correlate to sociodemographic factors on a state by state basis.<sup>37</sup> They found a significant negative relationship between HPV vaccine rate and the percent of children attending religious services on a weekly basis. A positive correlation was found for paediatricians per 1000 inhabitants and percent of people who completed a bachelor's degree. Interestingly, 2008 HPV vaccination rates were not higher in states that had higher cervical cancer rates in 2004.

## Further Assistance

Please do not hesitate to contact us if you would like any further information on the themes or research presented above. If you require more information on any of the mentioned research, we can supply you with the abstracts or posters. Alternatively, we can offer to conduct a more detailed literature search on any given topic.

- 1 LaPensee K, Carson R, Werner P, Sexton CC, Gelhorn H, Stankus A, Erder MH. Effect of equivalent and non-equivalent substitution of prescribed drugs for depression and anxiety disorders on patients' treatment adherence and perception. ISPOR 15<sup>th</sup> International Meeting 2010; PMH75
- 2 Lui X, Tepper P, Mullins CD. Treatment persistence with duloxetine and healthcare costs in patients with major depressive disorder. ISPOR 15<sup>th</sup> International Meeting 2010; PMH46
- 3 Chen Y, Lui X, Faries D, Watson P. Adherence and persistence with Medication therapy in patients with major depressive disorder: a real-world comparison of branded antidepressants and generic SSRIs. ISPOR 15<sup>th</sup> International Meeting 2010; PMH61
- 4 Nwokeli E, Bohman T, Wallisch L, Ostermeyer B, Reed B, Spence R et al. Evaluating patient adherence to antidepressant therapy among uninsured working adults diagnosed with major depression: 12-month results from the Texas Demonstration to Maintain Independence and Employment study. ISPOR 15<sup>th</sup> International Meeting 2010; PMH63
- 5 Luthra R, Helm ME, Li C, Said Q. Association of patient characteristics with the use of pharmacotherapy, psychotherapy and combined treatment for depression. ISPOR 15<sup>th</sup> International Meeting 2010; PMH88
- 6 Lui X, Cui Z, Watson P, Niu L, Mitchell BD, Faries D, Gopal M. Predictors of high-dose prescription with duloxetine for major depressive disorder. ISPOR 15<sup>th</sup> International Meeting 2010; PMH23
- 7 Chen S, Toh S. National trends in prescribing antidepressants for depression before and after FDA advisory on risk of suicidality among children and adolescents. ISPOR 15<sup>th</sup> International Meeting 2010; PMH87
- 8 Kale HP, Nair RR. Impact of FDA antidepressant black box warning and other regulatory changes on prescription patterns for children by office based physicians using National Ambulatory Medical Care Survey (NAMCS). ISPOR 15<sup>th</sup> International Meeting 2010; PMH85
- 9 Walczak J, Nogas G, Gardacka M, Obrzut G, Pieniazek I. Escitalopram (generic drug) in major depressive disorder (MDD) – budget impact analysis. ISPOR 15<sup>th</sup> International Meeting 2010; PMH27
- 10 Walczak J, Garbacka M, Obrzut G, Pieniazek I. Economic analysis of escitalopram (generic drug) in major depressive disorder (MDD). ISPOR 15<sup>th</sup> International Meeting 2010; PMH52
- 11 Walczak J, Malysiak S, Rowinska M. Comparative analysis of the efficacy and safety of escitalopram with sertraline and venlafaxine in the treatment of major depressive disorder (MDD). ISPOR 15<sup>th</sup> International Meeting 2010; PMH19
- 12 Langley PC, Wagner J-S, DiBonaventura M. Perceived caregiver burden and health related quality of life in Alzheimer's caregivers. ISPOR 15<sup>th</sup> International Meeting 2010; PND20
- 13 Zheng Y, Goldman DP, Michaud PC, Lakdawalla D, Joyce G, Vayman I, Gailey A. Projecting the burden of Alzheimer's disease and evaluating the potential impacts of preventing Alzheimer's disease in the United States. ISPOR 15<sup>th</sup> International Meeting 2010; PND37
- 14 Chatterjee S, Palli SR, Mehta S, Aparasu RR, Sherer JT. Prevalence and predictors of anticholinergic medication use in elderly nursing home residents with dementia. ISPOR 15<sup>th</sup> International Meeting 2010; PMH21
- 15 Bloudek L, Spackman DE, Sullivan SD. A comparison of transitions between health states and institutionalization among Alzheimer's disease patients versus non-Alzheimer's disease patients. ISPOR 15<sup>th</sup> International Meeting 2010; PMH26
- 16 Lachaine J, Beauchemin C, Legault M, Le Lay A. Economic evaluation of the impact of memantine on time to nursing home admission in the treatment of Alzheimer's disease. ISPOR 15<sup>th</sup> International Meeting 2010; PND17
- 17 Patel B, Kamal KM, Atreja N. A systematic review of economic analyses of rasagiline and entacapone in Parkinson's disease. ISPOR 15<sup>th</sup> International Meeting 2010; PND13
- 18 Hudry J, Rinne JO, Keränen T, Eckert L, Cochran JM. Cost-utility model of rasagiline in the treatment of advanced Parkinson's disease in Finland. *Ann Pharmacother.* 2006; 40(4): 651-7.
- 19 Jenkinson C, Fitzpatrick R, Findley L, Churchman D. Cross cultural evaluation of the short-form 8 item Parkinson's disease questionnaire results from America, Canada, Japan, Italy, Spain. ISPOR 15<sup>th</sup> International Meeting 2010; PND28
- 20 Pinsky BW, Huang H, Teitelbaum A, Esseltine D-L, Henk HJ. Multiple myeloma: Patient out-of-pocket costs and healthcare utilisation. ISPOR 15<sup>th</sup> International Meeting 2010; PSY19
- 21 Eaddy M, Chen L, DuBois R, Davies EH. A comparison of intravenous and oral formulations of fludarabine in the treatment of chronic lymphocytic leukemia (CLL). ISPOR 15<sup>th</sup> International Meeting 2010; PCN7
- 22 Guerin A, Bollu V, Williams D. Lower health care resource utilization associated with managing nilotinib related adverse events in chronic myeloid leukaemia (CML) patients: evidence from a clinical practice setting study. ISPOR 15<sup>th</sup> International Meeting 2010; PCN54
- 23 Wu EQ, Bollu V, Guo A, Guerin A, Tsaneva M, Williams D, Griffin JD. Comparison of healthcare resource utilization and costs between nilotinib and dasatinib as second line therapies in chronic myeloid leukaemia (CML). ISPOR 15<sup>th</sup> International Meeting 2010; PCN47
- 24 Wu EQ, Bollu V, Guo A, Guerin A, Yu AP, Sirulnik A, Griffin JD. Non-adherence to imatinib in chronic myeloid leukemia patients is associated with a short term and long term negative impact on healthcare utilization and costs. ISPOR 15<sup>th</sup> International Meeting 2010; PCN48
- 25 Partridge AH, Avon J, Wang PS, Winer EP. Adherence to therapy with oral antineoplastic agents. *J Natl Cancer Inst.* 2002;94(9):652-61
- 26 Persson S, Ghatnekar O, Liwing J, Aschan J, Mellqvist UH. Similarities and differences in treatment patterns and resource utilisation for multiple myeloma: a comparison between 4 Nordic countries. ISPOR 15<sup>th</sup> International Meeting 2010; PCN100
- 27 Rubin J, McGarry L, Klugman K, Stratton D, Gilmore K, Hwang S et al. Public health and economic impact of 13-valent pneumococcal conjugate vaccine (PCV13) in an influenza pandemic in Singapore and Hong Kong. ISPOR 15<sup>th</sup> International Meeting 2010; TR4
- 28 Lee KKC, Chow DPY, Lee VWY, Earnshaw S, Farkouh R, Stratton DR. An initial cost-effectiveness analysis of the new 13-valent pneumococcal conjugate vaccine (PCV13) versus PCV7 in the public sector of Hong Kong. ISPOR 15<sup>th</sup> International Meeting 2010; PIN24
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