Thailand’s perspective on cost-effectiveness and financing of vaccines

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International Rotavirus Symposium, Melbourne
9 September 2016
Health financing in Thailand

• Upper middle income country – not eligible for GAVI support

• Population: 67 million; 760,000 births per year

• Total Health Expenditure: USD 13.6 billion, 3.7% of GDP (2013)

• Universal health coverage achieved in 2002
  o Provider-purchaser split
    o 3 tax-based schemes: government officers, private employees, and the rest
    o Comprehensive benefits package

• Immunization program financed by the Universal Coverage Scheme (UCS), under the National Health Security Office (NHSO)
Pharmaceutical benefit package – the NLEM

- **National List of Essential Medicines (NLEM):** medicines and vaccines
- NLEM – regulatory reference for procurement and hospital formularies in the government sector
- Health technology assessment (HTA) – NLEM revision & price negotiation
  - HTA methods guidelines, 2008 and 2012 editions, endorsed by the NHSO and NLEM Committee
  - Evidence requested by policymakers: cost effectiveness, budget impact and feasibility
  - No legal-binding for policymakers to follow HTA-based recommendations
Dual tracks of immunization policymaking

National Committee for Drug System Development

Appointment

NLEM Committee

Recommendations

Revision of the NLEM

Approval

National List of Essential Medicines (NLEM)

Vaccines: Financed by the UCS (approved by the NHSO Board)

Criteria: Disease burden, safety & efficacy, cost effectiveness, budget impact

Purchaser

National Advisory Committee for Immunization & Practice (NACIP)

Recommendations

MOH (Department of Disease Control)

New vaccine adoption

National Immunization Program

Criteria: Disease burden, safety & efficacy, cost effectiveness, cost benefit, public health impact, feasibility

Immunization policymaker
Review of essential medicine candidates

National Committee for Drug System Development

NLEM Committee

Medicine Selection Working Groups (~ 20 specialties)

• Health Economics Working Group
• Price Negotiation Working Group
• Orphan Medicines Working Group
• High-cost Medicines List Working Group
• NLEM Monitoring & Evaluation Working Group
• Others

Appointment

Recommendations

Propose and review medicine candidates: health need, safety, effectiveness and quality
Cost-effectiveness analysis

Incremental cost-effectiveness ratio (ICER) = \frac{\text{cost}_{\text{new}} - \text{cost}_{\text{current}}}{\text{QALY gain}_{\text{new}} - \text{QALY gain}_{\text{current}}}

Cost-effectiveness threshold, Thailand

Employed by the NHSO and NLEM Committee

- **Current threshold**: 160,000 Baht per QALY
- **Threshold in 2012**: 120,000 Baht per QALY
- **Threshold in 2008**: 100,000 Baht per QALY

(1 USD = 35 THB)
## Cost effectiveness and NLEM decisions

<table>
<thead>
<tr>
<th>Medicines</th>
<th>Indications</th>
<th>ICER (Baht/QALY)</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Peg-interferon alpha 2a, 2b</td>
<td>Chronic hepatitis C subtype 2, 3</td>
<td>cost-saving</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Lamivudine or tenofovir</td>
<td>Chronic hepatitis B</td>
<td>cost-saving</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Bevacizumab</td>
<td>Age-related macular degeneration, diabetic macular edema</td>
<td>cost-saving</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Intravenous immunoglobulin</td>
<td>Dermatomyositis</td>
<td>cost-saving</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Intravenous immunoglobulin</td>
<td>Idiopathic thrombocytopenic purpura (ITP)</td>
<td>87,000</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Oxaliplatin</td>
<td>Advanced colorectal cancer</td>
<td>126,000</td>
<td>Yes*</td>
</tr>
<tr>
<td>7. Galantamine, donepezil or rivastigmine</td>
<td>Alzheimer's disease, mild-to-moderate</td>
<td>157,000-240,000</td>
<td>No</td>
</tr>
<tr>
<td>8. Alendronate, risedronate, raloxifene</td>
<td>Osteoporosis</td>
<td>300,000-800,000</td>
<td>No</td>
</tr>
<tr>
<td>9. Rituximab + CHOP regimen</td>
<td>Diffused large B-cell lymphoma</td>
<td>600,000</td>
<td>No</td>
</tr>
<tr>
<td>10. Rituximab</td>
<td>Rheumatoid arthritis</td>
<td>1,100,000</td>
<td>No</td>
</tr>
<tr>
<td>11. Gefitinib or erlotinib</td>
<td>Second-line treatment for non-small cell lung cancer</td>
<td>1,500,000-2,000,000</td>
<td>No</td>
</tr>
<tr>
<td>12. Sunitinib</td>
<td>Metastasis renal cell carcinoma</td>
<td>2,400,000</td>
<td>No</td>
</tr>
<tr>
<td>14. Ustekinumab</td>
<td>Chronic plaque psoriasis</td>
<td>3,500,000</td>
<td>No</td>
</tr>
<tr>
<td>15. Imiglucerase</td>
<td>Gaucher disease type 1</td>
<td>6,300,000</td>
<td>Yes*</td>
</tr>
</tbody>
</table>
Use of cost-effectiveness evidence in price negotiation

<table>
<thead>
<tr>
<th>Products</th>
<th>Original price (THB)</th>
<th>Reduced price (THB)</th>
<th>Saving (THB per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenofovir</td>
<td>43</td>
<td>12</td>
<td>375 million</td>
</tr>
<tr>
<td>Pegylate interferon alpha-2a</td>
<td>9,241</td>
<td>3,150</td>
<td>600 million</td>
</tr>
<tr>
<td>Oxaliplatin (injection 50 mg/25 ml)</td>
<td>8,000</td>
<td>2,500</td>
<td>152 million</td>
</tr>
</tbody>
</table>
Budget impact – Affordability

“It is likely that other factors beyond cost effectiveness, including the overall budgetary impact, are particularly important for decision making in low- and middle-income countries”


Source: Chunsuttiwat S. Principles and Practice of Vaccine Introduction in Thailand, 2011
81 countries* have introduced rotavirus vaccines nationally

*As of May 1, 2016

Source: http://sites.path.org/rotavirusvaccine/country-introduction-maps-and-spreadsheet/
Department of Disease Control’s role in vaccine introduction

- Verify disease burden
- Determine cost effectiveness and cost benefit
- Ensure program feasibility
- Ensure affordability & sustainability

Source: adapted from Limwattanayingyong, 2014
**WHO recommendations**

Rotavirus vaccines should be included in all national immunization programmes and considered a priority, particularly in countries with high RVGE-associated fatality rates, such as in south and south-eastern Asia and sub-Saharan Africa.

The use of rotavirus vaccines should be part of a comprehensive strategy to control diarrhoeal diseases with the scaling up of both prevention (promotion of early and exclusive breastfeeding, handwashing, improved water supply and sanitation) and treatment packages.

... cost-effectiveness assessment, issues of affordability of the vaccine, financial and operational impact on the immunization delivery system, and careful examination of current immunization practices should be taken into account.
A Systematic Review of Economic Evaluation Methodologies Between Resource-Limited and Resource-Rich Countries: A Case of Rotavirus Vaccines

Kittiphong Thiboonboon¹ · Benjamin Santatiwongchai¹ · Varit Chantarastapornchit¹ · Waranya Rattanavipapong¹ · Yot Teerawattananon¹
Published articles on economic evaluation of rotavirus vaccines in Thailand


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<tbody>
<tr>
<td>Academics</td>
<td>Authors</td>
<td>Thai MOH and academics</td>
</tr>
<tr>
<td>Provider</td>
<td>Perspectives</td>
<td>Societal &amp; provider</td>
</tr>
<tr>
<td>No-vaccination</td>
<td>Comparator</td>
<td>No-vaccination</td>
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<tr>
<td>5 years</td>
<td>Time horizon</td>
<td>5 years</td>
</tr>
<tr>
<td>Not clearly stated</td>
<td>Cost/outcome discounting</td>
<td>3%</td>
</tr>
<tr>
<td>2007/Not clearly stated</td>
<td>Price date/CPI adjusted</td>
<td>2009/Yes</td>
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<tr>
<td>Not clearly stated</td>
<td>Approach/study parameters shown</td>
<td>Decision tree/Yes</td>
</tr>
<tr>
<td>Not clearly stated</td>
<td>Source of funding/ COI declared</td>
<td>Thai MOH/Not clearly stated</td>
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</table>

Conclusion

• HTA plays a crucial role in health policy making in Thailand
  
  o Cost-effectiveness evaluation for priority setting of health interventions with different costs and outcomes

• Budget impact – AFFORDABILITY

• Collaboration: the UCS, NLEM Committee, NACIP and MOH → timely access to new vaccines + health systems efficiency & sustainability
  
  1) Agreed economic evaluation guidelines and ICER threshold
  2) Information and data sharing
  3) Joint process for price negotiation
  4) Transparency and technical integrity – avoid COI
Acknowledgements:

- Bureau of Policy & Strategy, MOH, Thailand
- Thailand Research Fund
- National Health Security Office, Thailand
- International Decision Support Initiative (iDSI)
- Thiboonboon K and HITAP colleagues

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