

the expected annual number of cervical cancer cases (CC) and deaths prevented by HPV vaccination of 12-year-old girls in Asian countries (WHO classes) at steady state. Input data are, for each country, the incident CC cases and deaths (GLOBOCAN 2002), the distribution of HPV types in CC (<http://www.who.int/hpcentre>) and the clinical trial vaccine efficacy against CIN2+ related to HPV-16/18 and HPV-31,45,33,52,58,35,39,51,56,59 combined (cross-protection). Lifetime vaccine protection is assumed. The effect of vaccination coverage and the use of alternative estimates for countries without sufficient data are explored. **RESULTS:** Of 47 countries, sufficient country-specific input data are available for eight (China, Japan, Iran, Indonesia, Republic of Korea, Thailand and Philippines). The model predicts that, with 100% vaccine coverage, the HPV-16/18 CC and death reduction ranges from 57% (Japan: -4421 cases; -2032 deaths) to 74% (Thailand: -4627 cases; -1942 deaths) while cross-protection related CC and death reduction ranges from 9% (Iran: -102 cases, -53 deaths) to 27% (Japan: -2073 cases; -953 deaths). The overall reduction ranged from 78% (Iran: -873 cases, -454 deaths) to 89% (Indonesia: -13,375 cases; -6724 deaths; Thailand -5534 cases; -2323 deaths). With 70% vaccine coverage the CC cases prevented ranges from 611 to 80,052 and CC deaths prevented from 318 to 44,921 for Iran and India respectively. Eastern, south-eastern, southern Asia and Asia continent distributions are available and can be used as a proxy for countries without sufficient HPV data. **CONCLUSIONS:** Modeling predicts HPV vaccination with a bivalent HPV-16/18 vaccine could result in substantial reductions in CC cases and deaths in Asian countries. Cross-protection could play an important role in this reduction.

INDIVIDUAL'S HEALTH – Cost Studies

A COSTING STUDY COMPARING MIDWIFERY GROUP PRACTICE WITH USUAL CARE IN AN AUSTRALIAN METROPOLITAN HOSPITAL

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OBJECTIVES: To undertake an economic evaluation of the costs and outcomes of midwifery group practice care compared with usual care in an Australian metropolitan hospital. **METHODS:** In a cohort study, pregnant women at low risk of complications could select to receive midwifery group practice care or usual care early in their pregnancy and were recruited when they were 35 weeks pregnant. Midwifery group practice provides care by the same two to three midwives and labor in a birth center. Usual care consists of women generally attending a GP or midwives antenatal clinic for antenatal care, followed by labor in the hospital. Costing data was collected from week 36 of pregnancy until 6 weeks postpartum. Costing for antenatal, labor, baby, and postnatal care were collected using the hospital accounting system. Women kept a diary with the number of antenatal and postnatal visits. Costing data on GP visits were calculated using the diaries and government reimbursement costs. **RESULTS:** The study included 102 women, with 52 women receiving midwifery group practice care and 50 women receiving usual care. Midwifery group practice care was associated with fewer antenatal visits, lower rate of induction and pharmacological pain relief, shorter stay in hospital and more postnatal visits. There were no statistical differences in clinical outcomes of the baby. The cost of antenatal care was similar between the groups; labor and baby costs were lower for midwifery group practice, while postnatal costs were higher in the midwifery group practice. Midwifery group practice was associated with a lower total cost per woman compared to usual care (A\$4447 vs. A\$5772, $P = 0.047$). **CONCLUSIONS:** For women at low risk of complications midwifery group practice is a cost-effective option, with better clinical outcomes and lower total costs.

PIH3

COST OF PUBLIC HEALTH DELIVERY OF CHILDHOOD IMMUNIZATIONS IN NOVA SCOTIA

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OBJECTIVES: Childhood immunizations are recognized as one of the most cost-effective health interventions. Yet little is known about the actual delivery costs, or variation in costs by service providers and geographic regions. This study undertook an economic analysis of public health delivery of childhood immunizations in Nova Scotia. **METHODS:** The analysis was performed from the perspective of the government health-care provider for a 1-year period from April 2005 to March 2006. An incremental approach was used to assess the cost of delivering childhood immunizations in addition to existing services. Primary cost data collected included capital and recurrent costs. Total provider economic costs were estimated using a combination of ingredients-based costing and step-down cost allocation methodologies. Sensitivity analysis was used to examine the influence of data uncertainty on cost results. Multivariate econometric analysis was used to estimate cost functions. **RESULTS:** Data was collected from four District Health Authorities in Nova Scotia, representing the delivery of 2951 immunizations. Average cost per immunization ranged from \$51 to \$105 when delivered in main public health offices and \$45 to \$150 when delivered in off-site clinics. The main cost driver was personnel costs. Econometric analysis showed a link between average cost and volume of service delivery. **CONCLUSIONS:**

PIH4

The cost of public health delivery of childhood vaccines varies according to the volume of services delivered and the delivery setting. The approach developed can be applied to the introduction of new vaccines such as human papilloma virus. Public health delivery of vaccines can be efficient if programmed on the appropriate scale.

PIH5

MEDICAL COST AND UTILIZATION FOR PATIENTS WITH POSTPARTUM HEMORRHAGE IN KOREA

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OBJECTIVES: To investigate medical cost and health resource utilization for patients with postpartum hemorrhage (PPH) in Korea in 2008. **METHODS:** This population-based study utilized the claims data of the Korea Health Insurance Review Agency from January 2008 to December 2008. Patients with PPH were identified based on ICD-10 code (O72, O721, O722, O723) that occurred within 6 weeks after normal or cesarean delivery. Treatments for PPH were classified into four categories: uterine contraction drugs only, drugs and transfusion, drugs + transfusion + uterine artery embolization (UAE), and drugs + transfusion + hysterectomy. Medical costs for PPH patients included all costs incurred for delivery and treating PPH. Costs and length of stay were analyzed in regard to the mode of delivery, age, and type of hospital where the delivery took place. Data were analyzed using SAS. **RESULTS:** There were 18,142 (4%) PPH patients out of 452,219 deliveries in Korea in 2008. The medical cost (mean \pm SD) in patients who underwent normal delivery (ND) without PPH was 610 \pm 153 US\$ and 758 \pm 859 US\$ for patients with PPH. The medical cost in patients who underwent cesarean delivery (CD) without PPH was 973 \pm 1403 US\$ and 860 \pm 511 US\$ for patients with PPH. Length of stays (mean \pm SD) were 3.7 \pm 1.8 days, 3.3 \pm 0.7 days, 7.7 \pm 8.8 days and 7.1 \pm 3.2 days for ND with PPH patients, ND without PPH patients, CD with PPH patients, and CD without PPH patients, respectively. The mean medical cost of patients who were treated with drugs only, drugs and transfusion, drugs + transfusion + UAE, and drugs + transfusion + hysterectomy were US\$628, US\$1028, US\$3850, and US\$3501, respectively. **CONCLUSIONS:** The medical cost was higher in patients with PPH compared to patients without PPH. Although the medical cost of treating PPH with UAE is higher than that of hysterectomy, preserving fertility seems well worth the additional cost.

PIH6

BUDGET IMPACT ANALYSIS OF INCLUDING LIVER TRANSPLANTATION IN CHILDREN INTO THE UNIVERSAL COVERAGE BENEFIT PACKAGE OF THAILAND

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BACKGROUND: Liver transplantation in children is an expensive health service excluded from the benefit package of the universal coverage (UC) scheme, which covers 47 million of Thais. Its high costs and exclusion from the UC benefit package prevent poor biliary atresia (BA) patients from access to such health care. **OBJECTIVES:** This study aims to estimate financial impact of including liver transplantation in children in the UC benefit package. It also explores demand for, and supply of, and financial feasibility in implementing universal access to such expensive health care in Thailand. **METHODS:** Methods include comprehensive literature review, in-depth interviews of medical specialists in liver transplantation in three university hospitals about incurred costs during and after operations, and modeling budget requirements for expanding universal access to such medical care. **RESULTS:** Research findings indicate that the incidence of BA patients in Thailand is approximately 1 to 15,000 of live births, approximately 60 new cases of BA patient annually. Only three university hospitals in Thailand can provide liver transplantation to children with the annual maximum surgical capacity of 40 cases. Literature shows the survival rate of BA children receiving liver transplantation ranges from 83% to 94% in the first year, and 82% to 92% in the fifth year. Costs of liver transplantation in the first year are approximately 1 million Baht (US\$30,000). Other costs after the first year including immunosuppressive drugs and prophylaxis antibiotics range from US\$360–600 per month. The government will spend approximately 40 million Baht in the first year of implementation. The financial burden will increase to 184 and 328 million Baht per year in the year 30th and 70th, respectively. **CONCLUSIONS:** The budget requirement for this medical care is trivial compared to the total UC budget, but can save lives of BA patients and improve equity in access to health care.

PIH7

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

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OBJECTIVES: 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 experts' panel discussions to estimate treatment costs and respondents' interviews using costing and SF-36 quality of life (QOL) questionnaires. Three programs options were compared i.e., Pap smear screening; quadrivalent HPV vaccination and combined strategy (screening plus vaccination). **RESULTS:** Five hundred two cervical cancer patients participated in the study. Mean