INFECTION—Cost Studies

BUDGET IMPACT ANALYSIS OF INTRODUCING ROUTINE VACCINATION WITH A QUADRIVALENT HPV-VACCINE IN NORWAY
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OBJECTIVES: To model the likely impact of introducing routine vaccination with a quadrivalent vaccine against HPV types 6, 11, 16 and 18 for 12 year old girls in Norway on relevant stakeholders’ budgets over each of the first 100 years. METHODS: An excel-based budget impact model was developed, based on the results of a mathematical model of the public health impact of different immunization strategies using the quadrivalent HPV vaccine. Natural disease history parameters were based upon international data. Rates of HPV infection, mortality, cervical cancer screening, treatment practice patterns and costs were based upon Norwegian-specific data. Both routine vaccination of 12 year old girls and the additional effect of including a 5 year catch-up vaccination program of females are modelled. The model evaluates both the direct costs related to the vaccination program, and cost savings due to reduced incidences of HPV-related disease; cervical intraepithelial neoplasia (CIN), invasive cancer and genital warts. The consequence for each stakeholder’s budget is described: The Norwegian Institute of Public Health (NIPH), the Norwegian Labour and Welfare Administration, the four Regional Health Authorities, patients and employers.

RESULTS: The results are presented graphically and in tabular form, for the various stakeholders and over time. Direct costs for vaccination for the public payer are considerable, but are somewhat offset by savings for other stakeholders. The effect of the vaccine on HPV 6 and 11 infections provides both earlier cost offsets and increases them substantially. For the first 35 years the majority of discounted costs avoided are due to the prevention of HPV 6 and 11 infections. CONCLUSIONS: This analysis demonstrates the benefit of analyzing budgetary consequences per stakeholder, over time and for virus types covered. It is important to model budget consequences not only from the public payer’s perspective but also from a societal one.

THE ECONOMIC IMPACT OF LOWER HIV PREVALENCE ESTIMATES
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OBJECTIVES: The “AIDS epidemic update” (2007) published by the United Nations (UN) and World Health Organization (WHO) recently reported lowered estimates for the number of person infected with HIV worldwide. This study examines the economic impact of these revised figures upon the costs associated with treating patients with antiretroviral (ARV) drugs or opportunistic infection (OI) prophylaxis. METHODS: The annual change in the number of persons infected with HIV in eight regions worldwide was calculated for 2006 and 2007 from the UN report. Average treatment rates were used to determine the number of patients treated with ARV or OI prophylaxis. The difference in the cost for treating these patients was estimated by multiplying the average cost of treatment by the number of patients treated. For ARVs, the average cost estimate for 2006 (USD) included first- and second-line drugs, lab costs, inpatient and outpatient costs and counseling. For OI prophylaxis, only drug and counseling costs were included. Low- and high-cost ranges were used to estimate drug costs. Only counseling, inpatient and outpatient costs varied by region. Sensitivity analysis was conducted on key inputs. RESULTS: The impact of 6.26 million fewer patients from 2007 to 2006 is estimated to be a total cost saving of USD$1.08 billion, or a 16.4% reduction in treatment costs. The new estimates yield a $952 million and a $129 million saving in annual ART and OI prophylaxis costs, respectively, compared to the 2006 estimates. Although the Sub-Saharan Africa region has the largest HIV prevalence, the revised estimates had the greatest impact on the total costs in South and South-East Asia, with a 48.7% reduction. CONCLUSIONS: The lower prevalence estimates provide a significant budget savings which varies greatly among regions. Upon further analysis, using more detailed prevalence and cost data, the savings may show even greater differences among countries within the same region.

COST-EFFECTIVENESS OF QUADRIVALENT HPV VACCINATION IN FINLAND
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OBJECTIVES: To determine costs caused by human papillomavirus (HPV) and to evaluate the cost-effectiveness of vaccinating 12 year old females with a quadrivalent HPV vaccine in Finland. METHODS: A comprehensive analysis, based on Finnish national health care, social insurance and cancer registries, allowed to evaluate the costs associated with cervical cancers, cervical lesions and genital warts diagnosed between 2001 and 2005 (health care costs, sick-leave compensations, disability pensions, and loss of productivity). An incidence-based model working in discrete time steps was developed to evaluate the effects of HPV vaccine. The model utilised Monte Carlo simulation to produce the outputs. Age-specific cervical cancer incidence rates were derived from population-based cancer registries. The model followed four cohorts of 12 year old females through their lives and the vaccine was assumed to be 100% effective against HPV types 6, 11, 16, 18. The analysis was performed from health care payer and societal perspectives. Sensitivity analyses were carried out to explore the effects of discount rates. RESULTS: Screening and management of HPV related diseases cost annually €50 M in Finland. Treatment of genital warts, cervical dysplasia and cancer costs €37 M. Solely pap screening costs €13 M. Vaccination of 12 year old females against HPV types 6, 11, 16 and 18 would cost €6,957 per additional QALY gained (no discounting) and €11,122/QALY (3.5% discounting for money and 1.5% for health benefits). CONCLUSIONS: Currently HPV causes significant health care costs for Finland. As €50,000/QALY is generally considered to be the threshold of cost-effective treatment in the developed countries, vaccination of 12 years old girls against 6, 11, 16, 18 HPV types would be an effective and economically profitable method to reduce the burden of the HPV related diseases.

COST-EFFECTIVENESS OF CERVARIX™, A PROPHYLACTIC CERVICAL CANCER VACCINE, IN SPAIN
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OBJECTIVES: Vaccination against human papillomavirus (HPV) has been recommended in Spain for girls aged 11–14 years old. Our objective was to estimate the cost-effectiveness of the bivalent HPV-16/18 AS04 adjuvant vaccine, Cervarix™ (GlaxoSmithKline), in the current Spanish setting with cervical cancer