following marker authorization of the 13-valent pneumococcal conjugate vaccine (PCV13) for adults might be considered. Thus, this study analyzes potential cost-effectiveness of an adult vaccination with PCV13 from the point of view of the German social health insurance. METHODS: In a cross-sectional study Markov model, efﬁcacies of the vaccines against invasive pneumococcal diseases (IPD), and community-acquired pneumonia (CAP, treated in either a hospital or a non-hospital setting) were calculated. A steady state is deﬁned as a setting in which the whole population (including new entrants) is vaccinated as recommended. The modeling of PPV23 and PCV13 distinguished between risk groups and both vaccines were compared to non-vaccination. Data on PCV13 were derived from published results on the 7-valent pneumococcal conjugate vaccine (PCV7). The effectiveness of individual pneumococcal vaccination of adults was adjusted for expected herd immunity effects of a pediatric PCV. Utilization of health care services and unit costs were taken from publicly accessible data bases. RESULTS: Compared to PPV23, PCV13 revealed the potential to avoid a greater number of yearly cases and deaths due to IPD and CAP in Germany. For PCV13 it can be expected that monetary savings, resulting e.g. from less hospitalization, compensate the costs of the vaccination program. The preliminary version of the model concludes that the cost-beneﬁt ratio is 1.16, i.e. € 1 spend on vaccination saves €1.16 treatment cost. CONCLUSIONS: Our model shows that the health economic beneﬁt of an immunization of adults with PCV13 can be expected to be higher than that of PPV23.

ECONOMIC IMPACT OF THE 10-VALENT PNEUMOCOCCAL NON-TYPEABLE HEMOPHILUS INFLUENZAE PROTEIN D CONJUGATE VACCINE (PHID-CV) IN A COHORT OF NEWBORN IN HONG KONG

OBJECTIVES: To simulate the potential beneﬁts of implementing infant vaccination with the 10-valent pneumococcal & non-typeable Haemophilus inﬂuenzae D vaccine (PHID-CV) compared with 13-valent pneumococcal conjugate vaccine (PCV13-13) and no vaccination. METHODS: A Markov cohort model with a 100-year time horizon was developed to project the impact of vaccination on the incidence of pneumococcal and non-typeable Haemophilus Influenzae (NTHi) infections in children and adults.

The potential public health beneﬁt of pneumococcal conjugate vaccines: example of the Czech Republic

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OBJECTIVES: To evaluate cost-effectiveness of routine pneumococcal vaccination with 10-valent pneumococcal non-typeable Haemophilus inﬂuenzae protein D vaccine (PHID-CV) compared with 13-valent pneumococcal conjugate vaccine (PCV13-13) and no vaccination. METHODS: A Markov cohort model with a 100-year time horizon was developed to project the impact of vaccination on the incidence of pneumococcal and non-typeable Haemophilus Influenzae (NTHi) infections in children and adults.

Data Sources: Czech Republic-speciﬁc epidemiological and demographic data and data from other country sources. The modeling of PPV23 and PCV13 distinguished between risk groups and both vaccines were compared to non-vaccination. The predicted prevalence of patients in different health states over time provided a good ﬁt to the clinical trial data. Strategies where raltegravir was included in the initiating therapy followed by an NNRTI or PI based regimen against efavirenz or PI based initiating therapies followed by raltegravir resulted in longer undetectable CD4+ T cells. In contrast to commonly used discrete-time Markov models, we developed a more realistic and sound approach. Results suggest initiating therapy on raltegravir generated lower costs and higher survival versus saving the drug for later lines of therapy in Portugal.

ECONOMIC EVALUATION OF AZITHROMYCIN COMPARED WITH OTHER ANTIBIOTICS FOR COMMUNITY-ACQUIRED PNEUMONIA AND SINUSITIS TREATMENT

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OBJECTIVES: To assess clinical efﬁcacy and economic effectiveness of Azithromycin compared with other antibiotics for community-acquired pneumonia (CAP) and sinusitis treatment. METHODS: Decision tree was used to calculate costs of antibiotic treatment. The chance nodes included treatment failures and introduction of second-line therapy or hospitalisation. Transition probabilities were derived from clinical trials. Preferred antibiotics for comparison with azithromycin (extended release, 2.0 g) and for second-line treatment were chosen by experts in a survey. Medical care costs were derived from Moscow mandatory medical insurance system. Costs of the medications were obtained from consumer prices database. Sensitivity analysis was carried out. RESULTS: Clinical efﬁcacy was equal. Costs of CAP treatment were 4390 rub (142.14$) for Amoxycillin and clavulanic acid, 5386 Rub ($174.39) for Cefuroxime axetil and 4053 Rub ($131.23) for Azithromycin. Costs of sinusitis treatment were 3637(117.76), 3728 ($120.71) and 3570 Rub ($115.59) for Amoxycillin and clavulanic acid, Cefuroxime axetil and Azithromycin respectively. CONCLUSIONS: Azithromycin is more efﬁcient option for CAP and sinusitis treatment than Cefuroxime axetil and Amoxycillin and clavulanic acid in Russia.

HEALTH ECONOMIC EVALUATION OF CONJUGATE PNEUMOCOCCAL VACCINES IN LATIN AMERICAN COUNTRIES

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OBJECTIVES: To study the potential beneﬁts of implementing infant vaccination with the 10-valent pneumococcal & non-typeable Haemophilus inﬂuenzae (NTHi) protein D conjugate vaccine (PHID-CV) or the 13-valent pneumococcal conjugate vaccine (PCV13) in Latin American countries. METHODS: Vaccine impact was assessed using a Markov cohort model for Mexico, Brazil, Chile, and Colombia. The model simulates the burden of pneumococcal- and NTHi-related diseases (Invasive Disease [ID], Community Acquired Pneumonia [CAP] and Acute Otitis Media [AOM]) in a birth cohort followed over a lifetime. Epidemiology, disease management and costs are country-speciﬁc. Vaccination schemes (3 + 1) at 90% coverage & price, for each vaccine were compared to no intervention. Future QALYs and costs discounted at 3.5%, using the health care payer perspective are presented. RESULTS: Mortality impact on ID and CAP for the two vaccines is projected to be comparable under base-case conditions which include minimum assumptions of NTHi infection rates. Vaccines are predicted to impact more than 14 000 cases of AOM in comparison with PCV13. Vaccinating a birth cohort with PHID-CV is expected to generate 75.3 more QALYs compared to PCV13. Under vaccine price policies assumptions, estimated total savings for health care system are 10.2 ml CZK or 395.6 K€ for PHID-CV compared to PCV13 respectively. Sensitivity analyses indicate that AOM efficacy and incidence of AOM related QALYs estimates have biggest impact on results. CONCLUSIONS: Overall, PHID-CV is expected to have better quality of life impact than PCV13. Under price parity assumptions, PHID-CV dominates PCV13 because it also has a larger cost offset.

A CONTINUOUS-TIME ECONOMIC MODEL TO EVALUATE RALTEGRAVIR USE STRATEGIES IN TREATMENT-NAIVE HIV-1 PATIENTS IN PORTUGAL

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OBJECTIVES: In contrast to commonly used discrete-time Markov models, we developed a more realistic continuous-time multi-stage Markov model to evaluate long-term clinical and economic outcomes of raltegravir in treatment naive HIV-1 patients. METHODS: The multi-stage cost-effectiveness model incorporating 3 lines of therapy was developed using differential equations and was solved in Mathematica® 6.0. The analysis was conducted from the perspective of the National payer in Portugal; a typical patient enters the model in a given health state, transitions to another health state, can develop acquired immunodeficiency syndrome (AIDS)/coronary heart disease (CHD)/other adverse events or die. Eighteen health states were defined based on CD4 and HIV RNA levels. We used the maximum likelihood method to estimate matrices of instantaneous transition rates corresponding to the efficacy of the included therapies. Six multi-stage treatment strategies depicting clinical practice in Portugal were evaluated. The model outputs included projected number of AIDS and CHD events, life expectancy and incremental cost-effectiveness ratios (ICERs). The model was evaluated for internal and external validity and extensive sensitivity analyses were conducted. RESULTS: The predicted prevalence of patients in different health states over time provided a good fit to the clinical trial data. Strategies where raltegravir was included in the initiating therapy followed by an NNRTI or PI based regimen against efavirenz or PI based initiating therapies followed by raltegravir resulted in longer undetectable CD4+ T cells. In contrast to commonly used discrete-time Markov models, we developed a more realistic and sound approach. Results suggest initiating therapy on raltegravir generated lower costs and higher survival versus saving the drug for later lines of therapy in Portugal.
to reduce 12.8 to 39.0 deaths (PCV13) and 12.4 to 37.3 deaths (PHD-CV) per 100,000 vaccinated children. The model predicts that PHD-CV will prevent 93 to 494 additional Myringotomies and 651 to 8,314 additional AOM cases per 100,000 vaccinated children, when compared with PCV13. Medical costs averted are estimated similar (ID) and outcomes (CAP) across the public health care system. The model predicts that PHD-CV will prevent 48 to 116 serious sequelae. 2008–2009 vaccination coverage and 2009 prices were used to estimate vaccine costs. Estimates of lifetime costs and QALYs per vaccinated child, discounted at 3% annually, were applied to a US birth cohort, assuming direct effects only. Costs are expressed in 2009 US$. Incremental costs and QALYs for individual vaccinated vs. unvaccinated were calculated. The model assessed schedule completion with single-dose vaccines as well as completion with two different pentavalent combination vaccines (DTaP, Hib or DTaP, polio, hepatitis B) plus single-disease vaccines. RESULTS: Regardless of how the current pediatric vaccine schedule is completed, the estimated cost savings range between $13.8 billion to $14.3 billion. DTaP, polio, Hib and HPV are cost-saving, as are both pentavalent vaccines and the whole schedule evaluated. The model assessed schedule completion with single-dose vaccines as well as completion with two different pentavalent combination vaccines (DTaP, polio, Hib or DTaP, polio, hepatitis B) plus single-disease vaccines. RESULTS: Regardless of how the current pediatric vaccine schedule is completed, the estimated cost savings range between $13.8 billion to $14.3 billion. DTaP, polio, Hib and HPV are cost-saving, as are both pentavalent vaccines and the whole schedule evaluated. The model assessed schedule completion with single-dose vaccines as well as completion with two different pentavalent combination vaccines (DTaP, polio, Hib or DTaP, polio, hepatitis B) plus single-disease vaccines. RESULTS: Regardless of how the current pediatric vaccine schedule is completed, the estimated cost savings range between $13.8 billion to $14.3 billion. DTaP, polio, Hib and HPV are cost-saving, as are both pentavalent vaccines and the whole schedule evaluated. The model assessed schedule completion with single-dose vaccines as well as completion with two different pentavalent combination vaccines (DTaP, polio, Hib or DTaP, polio, hepatitis B) plus single-disease vaccines. RESULTS: Regardless of how the current pediatric vaccine schedule is completed, the estimated cost savings range between $13.8 billion to $14.3 billion. DTaP, polio, Hib and HPV are cost-saving, as are both pentavalent vaccines and the whole schedule evaluated. The model assessed schedule completion with single-dose vaccines as well as completion with two different pentavalent combination vaccines (DTaP, polio, Hib or DTaP, polio, hepatitis B) plus single-disease vaccines. RESULTS: Regardless of how the current pediatric vaccine schedule is completed, the estimated cost savings range between $13.8 billion to $14.3 billion. DTaP, polio, Hib and HPV are cost-saving, as are both pentavalent vaccines and the whole schedule evaluated. The model assessed schedule completion with single-dose vaccines as well as completion with two different pentavalent combination vaccines (DTaP, polio, Hib or DTaP, polio, hepatitis B) plus single-disease vaccines. RESULTS: Regardless of how the current pediatric vaccine schedule is completed,