

are well established, the value of possible life extensions is not. Estimates of the value of a statistical life are of limited relevance to valuing such quality-adjusted longevity gains. **OBJECTIVES:** To estimate older smokers' willingness to pay (WTP) for quality-adjusted longevity gains. **METHODS:** Smokers aged 50–64 completed a computerized conjoint-analysis (discrete-choice experiment) survey instrument. Hypothetical longevity profiles described restrictions on activities of daily living (ADL) for longevity increases between 1 and 4 years. The choice task used to explain to respondents how risk reductions could be realized without smoking cessation was through the purchase of hypothetical cigarette filters that had no effect on smoking benefits. The joint determination of the type and quantity of filters was modeled jointly to estimate choice of filter type and demand. WTP for life extensions under specified ADL restrictions then were derived from model parameters. **RESULTS:** A total of 248 subjects completed the survey. ADL restrictions are a stronger determinant of WTP than years of longevity increases. Valuations of life extensions are positive only for high ADL levels. The present-value WTP for a one-year life extension with the ADL level described as "You are able to drive and you are able to walk a few blocks" is \$126,000 (3% discount rate). For the ADL level "Unable to leave your bed", the corresponding WTP is minus \$204,000. **CONCLUSIONS:** Our results shed new light on the perceived value to middle-aged subjects of longevity increases under specified ADL restrictions. The WTP estimates suggest that the net benefits of interventions with modest increases in longevity are likely to be positive only if the interventions also yield high quality of life.

#### PODIUM SESSION II: VACCINES – COST EFFECTIVENESS ANALYSIS STUDIES

##### SEVEN, TEN OR THIRTEEN? THE COST-UTILITY OF INFANT VACCINATION WITH A 7-, 10- OR 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE IN THE NETHERLANDS

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**BACKGROUND:** Since 2006, Dutch children receive a 7-valent pneumococcal conjugate vaccine (PCV7) against *Streptococcus pneumoniae* (pneumococci), a leading cause of childhood illnesses. New vaccines, covering a wider range of serotypes, will soon be available. **OBJECTIVES:** To evaluate the cost-effectiveness of 10- and 13-valent vaccines (PCV10 and PCV13) by calculating quality adjusted life years (QALY) and costs, and estimate the cost-utility from the societal perspective. **METHODS:** A Markov model was used to calculate the effects of vaccinating a single cohort of newborn children in terms of two non-invasive diseases (pneumonia, acute otitis media) and two invasive diseases (meningitis, bacteremia) with associated sequelae and mortality. Vaccination effectiveness was estimated using trial data. Scenario analysis was conducted to analyze the effects of herd immunity. Probabilistic sensitivity analysis was carried out on incidences, costs, transition probabilities, utility weights and vaccine effectiveness. **RESULTS:** Assuming equal price per dose, both PCV10 and PCV13 were dominant compared to PCV7, with lower costs and more QALYs. Due to the larger range of serotypes, PCV13 has the fewest cases of pneumonia, invasive diseases and sequelae, and is the most cost-effective treatment, dominant to both other treatments. However, the superior effectiveness of PCV10 against the very prolific otitis compensates in such a way that the difference in both costs and QALYs between PCV10 and PCV13 is much smaller than was expected beforehand. **CONCLUSIONS:** From a cost-utility perspective, PCV7 could be replaced by either one of the new vaccines, when they become available. The choice between PCV10 and PCV13 will depend primarily on price setting and the importance that is assigned to indirect costs. PCV10 prevents more cases of frequent, but cheaper otitis, PCV13 prevents more cases of less frequent, but more costly in both money and effects, invasive diseases.

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##### A HEALTH ECONOMIC EVALUATION OF A NEW HERPES ZOSTER (HZ) VACCINE FOR THE PREVENTION OF HZ AND POST-HERPETIC NEURALGIA (PHN) IN BELGIUM

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**OBJECTIVES:** A vaccine for the prevention of HZ and PHN will soon be available in Europe. This study assesses the clinical and economic impact of vaccination in Belgium. **METHODS:** Using a Markov model specifically developed for Europe, a vaccination strategy for the Belgian population aged 60+ years was compared to the current situation of no vaccination. Most epidemiological, resource utilisation and general population data were obtained from Belgian sources. In the absence of Belgian data, the proportion of PHN was derived from the General Practitioners Research Database analysis in the UK, while HZ/PHN pain split, PHN duration and utility data were based on the literature. Outcomes included NNV (numbers needed to vaccinate), QALYs gained, HZ and PHN cases avoided, applying a PHN definition of pain occurring or persisting at least 3 months after rash onset. **RESULTS:** A vaccination strategy compared to no-vaccination resulted in ICERs of €6,799/QALY gained, €1,308/HZ case avoided and €3,842/PHN case avoided over the lifetime of the 60+ population, under a third-party payer perspective. NNV results indicated that 12 and 35 people must be vaccinated to avoid one case of HZ and PHN respectively. Subgroup analyses for the 60–69 age group showed ICERs of €5,545/QALY gained,

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€843/HZ case avoided, €2,976/PHN case avoided, and NNVs of 8 and 28 respectively. Deterministic sensitivity analyses produced ICERs ranging from €4,959 to €19,052/QALY gained, with the duration of vaccine efficacy having the biggest impact on results. A probabilistic sensitivity analysis showed that the probability of the ICERs remaining below €30,000 is 94.5% for the 60+ population and 95.9% for the 60–69 population, confirming the cost-effectiveness of vaccination. **CONCLUSIONS:** The ICERs are well below the commonly accepted threshold of €30,000/QALY gained, indicating that a HZ vaccination programme would represent a cost-effective intervention for Belgium.

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##### GLOBAL MEASLES ERADICATION: COST-EFFECTIVENESS AND IMPLICATIONS FOR GHANA, 2020–2049

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**OBJECTIVES:** Following recent successes in reducing measles mortality worldwide, the WHO has raised the question of the feasibility and cost-effectiveness of the global eradication of measles, allowing the stoppage of routine immunization. We estimated the potential economic value of measles eradication for a lower-income country using the example of Ghana as a case study. We also considered a post-eradication scenario with national stockpiling of a measles vaccine to be used in the event of the re-introduction either by accident or bioterrorism. **METHODS:** We estimated timing of measles elimination (cessation of within-country transmission), and the numbers of measles cases and deaths from an age-structured dynamic compartmental model. After elimination, there would be a residual number of cases imported from neighbors. We assumed that global eradication would eliminate this importation beginning in 2020 through a model horizon of 2049. For Ghana, based on accounting and budget data, the estimated cost per routine immunization dose was \$2.07 and for doses during campaigns was \$0.70. **RESULTS:** The dynamic model predicted that elimination would be achieved in Ghana in 2009. Between 2020 and 2049, there would be 1711 cases and 55 deaths. The aggregate present discounted value (to 2010) of the cost of routine immunization over this period would be \$25.2 million. If measles were eradicated in 2019 and immunization halted thereafter, Ghana would save this amount. However, if there were a perceived need to maintain a stockpile to protect the 20.8 million children projected to be born over this period, even at \$0.70 per dose, it would require a shelf life of more than 15 years to be cost-effective. **CONCLUSIONS:** Despite the obvious appeal of the global eradication of measles as a long-term objective, it appears unlikely that—even with a post-eradication stockpiling strategy—it would be cost-effective to cease ongoing vaccination entirely.

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##### HEALTH ECONOMIC EVALUATION OF A NOVEL INTRADERMAL INFLUENZA VACCINE IN TWO EUROPEAN COUNTRIES

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**OBJECTIVES:** A novel intradermal vaccine (ID) containing 15 µg of haemagglutinin per dose was specifically developed to prevent seasonal influenza in subjects aged 60 years and over (60+). In this population, superior immunogenicity of ID vaccine to conventional intramuscular vaccine (IM) has been demonstrated during clinical trials. We assessed the clinical outcomes and economic impact of vaccinating 60+ with ID versus IM vaccines. **METHODS:** A decision-analytic model compared the cost-effectiveness ratios of ID versus IM vaccines. Epidemiological and economic inputs were specific to Slovakia and Czech Republic, whereas vaccine effectiveness rates were estimated from international literature and inferred from clinical trials. ID prices were hypothetical. Results were reported according to public payer's perspective. **RESULTS:** In Slovakia, ID vaccination was found to prevent 13,134 influenza cases, 1,159 hospitalizations and 273 deaths in the 60+ population, more than with IM vaccination (respectively 11,235 influenza cases, 991 hospitalizations, 234 deaths). In Czech Republic these figures were respectively 35,691, 3,642 and 584 with ID versus 30,532, 3,115 and 500 with IM. Higher price of ID versus IM was partially offset by the costs saved thanks to disease avoided: an incremental €5 per subject vaccinated with ID in Slovakia and €4.4 (CZK118.10) in Czech Republic was required from the payer's perspective. Incremental cost-effectiveness ratios of ID versus IM were €12,852/QALY in Slovakia and €10,375/QALY (i.e. CZK278,532/QALY) in Czech Republic. These values were below three yearly GDP per capita in these 2 countries and therefore could be seen as acceptable for health authorities. In probabilistic sensitivity analyses, ID vaccination remained a cost-effective strategy. **CONCLUSIONS:** In the absence of published local guidelines regarding the interpretation of cost-effectiveness ratios, we chose to follow WHO guidelines regarding GDP per capita: immunizing the 60+ population with ID in Slovakia and Czech Republic appears as a cost-effective alternative when compared to IM.