were assumed to be $5 (Minimum-Maximum for Scenario Analysis [Min-Max SA]: 2-10) and $1, respectively. Both costs and benefits were discounted at 3%. **RESULTS:** Over 42 malaria endemic sub-Saharan countries, vaccination with RTS,S at DTP-coverage was estimated to avert 7.8 (95%CI:4.2-10.6) and 9.3 (95%CI:4.9-12.7) million malaria episodes and 50,198 (95%CI:-7,759-108,565) and 63,114 (95%CI:12,218-110,465) malaria deaths for a birth cohort vaccinated without and with a 4th dose, respectively. The overall incremental cost-effectiveness ratio was estimated to reach $232 (Min-Max SA:111-433) and $248 (Min-Max SA:119-462) per disability-adjusted life-years averted without and with 4th dose, respectively. **CONCLUSIONS:** The potential public health impact of implementing RTS,S in infants is estimated to be substantial and likely a cost-effective intervention referring to the WHO willingness-to-pay threshold. However impact and cost-effectiveness of RTS,S would increase if malaria vaccination is given at a later age when a higher efficacy has been reported.

VA2

COST-EFFECTIVENESS ANALYSIS OF QUADRIVALENT VERSUS TRIVALENT INFLUENZA VACCINATION IN GERMANY — LINKING A DYNAMIC TRANSMISSION MODEL WITH HEALTH AND ECONOMIC OUTCOMES

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OBJECTIVES: Trivalent influenza vaccine (TIV) contains two Influenza A strains, but only one of the two B-lineages, resulting in frequent mismatches between vaccines and circulating B-lineages during seasonal epidemics. Quadrivalent influenza vaccine (QIV) prevents such mismatches by including both B-lineages. The objective of our study was to estimate the cost-effectiveness (CE) of QIV versus TIV in Germany by coupling influenza incidence generated by a dynamic individual-based simulation to health and economic outcomes. **METHODS:** An individual-based simulation tool (known in the literature as 4FLU) was refined to estimate the impact of TIV and QIV on clinical infection incidence per year and age over 20 calendar years in Germany. Cases were subsequently linked to health and economic outcomes. Inputs were gathered from national databases and published literature. Vaccination rates reflect the current coverage in Germany; 2014 was used as the baseline year for costs. The productivity costs (societal perspective) were calculated according to the human capital approach. Costs and effects were discounted at 3% and 1.5%, respectively. Univariate and probabilistic sensitivity analyses were performed. **RESULTS:** Per 100,000 inhabitants, QIV prevents 6,803 more clinical influenza cases and 6.45 more deaths than TIV, accumulated in 20 years. From the societal perspective, QIV dominates TIV, with €1,424,323 of cost savings and 152 QALYs gained (98 QALYs by preventing clinical cases and 54 QALYs by avoiding premature mortality). These results are sensitive to changes in perspective, vaccination coverage, vaccine prices, productivity cost approach and discount rates, yet favorable CE remains. **CONCLUSIONS:** Based on our analysis, QIV is expected to be cost-effective, or even cost-saving in Germany. Our results are in line with findings from other studies using dynamic models and for other settings.

VA3

ECONOMIC EVALUATION OF CHILDREN VACCINATION FROM 2 TO 18 YEARS OF AGE WITH THE LIVE ATTENUATED INFLUENZA VACCINE COMPARED WITH THE EXISTING VACCINES IN THE PORTUGUESE SETTING

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OBJECTIVES: Vaccination is established as one of the most effective methods to prevent influenza and reduce the related social and economic burden. The objectives of this study were to estimate the cost-effectiveness ratios of using the live attenuated influenza vaccine (LAIV), indicated for children aged 2 to 18 years, as well as evaluate the impact of herd immunity in the non-vaccinated population. **METHODS:** An adaptable and flexible dynamic transmission model, stratified by age, was used to simulate the impact of influenza infection, with a time horizon of 5 years. This study was conducted in a payer perspective and was adapted to the Portuguese setting, as all data related to demographics and costs belonged to Portuguese sources. **RESULTS:** In the base case scenario, two different childhood vaccination policies were compared: use the trivalent influenza vaccine (TIV) currently in the market or use the LAIV, both for healthy children population. For the same number of vaccinated individuals, the LAIV achieved a reduction in the incidence of influenza and in the number of deaths due to influenza mostly among the elderly, when compared with the results obtained with TIV. The incremental cost-effectiveness ratios obtained were 7,448 and 8,527€/QALY, for a vaccination coverage of 25 and 75%, respectively. The net monetary benefit obtained was positive. **CONCLUSIONS:** The results showed that the strategy for influenza vaccination using LAIV in children is cost-effective as it reduces the costs related to influenza infection and has a positive impact in the Portuguese healthcare from direct and indirect protection in the community.

VA4

COST OF PAEDIATRIC VACCINE ADMINISTRATION IN THE UNITED KINGDOM (UK): A TIME AND MOTION (T&M) STUDY

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OBJECTIVES: Few studies have estimated time and associated cost related to a paediatric vaccination visit. Time and Motion (T&M) methodology is suitable to collect efficiency-related outcomes. The aim was to quantify active healthcare professional (HCP) time and associated costs of a single vaccination process administered in a paediatric population in the UK. **METHODS:** Paediatric vaccination processes were observed in 6 General Practitioner (GP) surgeries across UK in children 2-14 months. Time to perform 7 clearly pre-specified tasks was recorded by trained observers using a stopwatch. Time of day measurements for subject time in GP surgery and vaccination room as well as consumables usage was collected. Time for tasks before vaccination day was obtained from opinion. A total 123 processes were observed (approximately 20 by site, equally distributed across visits 1 to 4). Analyses were run by site and pooled across sites using a random intercept model. Published 2014 PSSRU data were used to transfer HCP time into cost. **RESULTS:** Mean HCP time for a vaccination process (including a mean 2.75 vaccine doses) was 9.5min (95% CI: 7.7-11.3); site range: 7.0-11.3min. Associated cost (90% practice nurse, 10% support staff) was £6.2; range: £4.7-£7.7. Mean time for a single oral and intramuscular vaccine administration was 1.0 and 0.4min, respectively. Mean time for a single vaccine reconstitution was 0.8min. Mean time in GP surgery was 23.9min (95% CI: 19.2-28.5), of which 8.4min in vaccination room (95% CI: 5.5-11.2). When including average supplies cost (£0.27), as well as an estimated 10.1 minutes per vaccination process prior to vaccination day (£5.5), total estimated cost per visit was £12.0. **CONCLUSIONS:** Paediatric vaccination requires substantial resources, including staff, facility, and parental time. Potential changes in the vaccination schedule would have an impact on associated time and cost and the vaccination unit's capacity to managing subjects.

RESEARCH PODIUM PRESENTATIONS – SESSION II

COST-EFFECTIVENESS STUDIES

CE1

BASAL INSULIN REGIMENS: SYSTEMATIC REVIEW, NETWORK META-ANALYSIS, AND COST - UTILITY ANALYSIS FOR THE NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE (NICE) CLINICAL GUIDELINE ON TYPE 1 DIABETES MELLITUS IN ADULTS

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OBJECTIVES: To assess the clinical and cost-effectiveness of basal insulin regimens for adults with type 1 diabetes mellitus (T1DM), from the English National Health Service (NHS) perspective, and inform NICE recommendation regarding optimal choice of basal insulin. **METHODS:** We considered seven daily insulin regimens: neutral protamine hagedorn (NPH) (once (od), twice (bid) and four-times daily (qid)), detemir (od and bid), glargine (od) and degludec (od). A systematic review of randomised controlled trials (RCTs) published in Medline, Embase and Cochrane databases to August 2014 was undertaken. Relative effectiveness was assessed using Bayesian network meta-analysis (NMA) undertaken in WinBUGs. Two outcomes were analysed: change in haemoglobin A1c (HbA1c) and rate of severe/major hypoglycaemia. The cost-utility analysis (CUA) was undertaken using the IMS-CORE Diabetes Model (IMS-CDM), following NICE reference case (lifetime time horizon, 3.5% discount rate for both costs and QALYs (quality-adjusted life-years), net monetary benefit (NMB) calculated using a threshold of £20,000 per QALY gained). Sensitivity analyses were performed; including changing insulin dose, discount rate and cost of hypoglycaemic events. **RESULTS:** Twenty eight RCTs were included in the NMA. The mean change in HbA1c ranged from -0.48% (SE=0.10) for detemir-(bid) to –0.01% (SE=0.17) for NPH-(qid). Mean rate of severe/major hypoglycaemia ranged from 29 (95%CI: 0.00 to 39.76) to 35 (95%CI: 0.00 to 46.73) events/100 person-years. The CUA showed that detemir-(bid) had the highest mean QALY-gain (11.09) and NMB (£181,456) per patient. Insulin glargine-(od) ranked second. Insulin degludec-(od) was the most costly, with the highest treatment cost (£7,169). The optimal choice was robust to all changes except when high doses of detemir-(bid) were assumed (>30% increment compared to other regimens); where glargine-(od) ranked first. **CONCLUSIONS:** Insulin detemir administered twice daily was the optimal basal regimen for adults with T1DM from the English NHS perspective; providing the highest QALY gain and NMB among the regimens considered.

CE2

A COST-EFFECTIVENESS ANALYSIS OF NOVEL ORAL ANTICOAGULANTS FOR PRIMARY PREVENTION OF VENOUS THROMBOEMBOLIC DISEASE

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OBJECTIVES: The annual incidence of venous thromboembolic (VTE) disease in Europe is 183 per 100,000. If preventative measures are not taken one in three surgical patients can experience a VTE. This study estimated the cost-effectiveness of novel oral anticoagulants in two primary prevention populations; post hip (THR) and post knee (TKR) replacement surgery. **METHODS:** For both TKR and THR populations, initial consequences (180 days) were modelled using a decision tree, followed by a Markov model for long term consequences. We evaluated cost-effectiveness of dabigatran, rivaroxaban and apixaban, compared with low molecular weight heparin (LMWH). Subjects that experienced a recurrent event were treated with apixaban and then received aspirin daily for the remainder of their lives. Model inputs differed between the two populations. Relative treatment efficacy and safety inputs came from network meta-analyses; other model inputs were based on a variety of evidence sources. Discounted (3.5%) health and benefits (QALYs) over a lifetime were estimated. **RESULTS:** In the THR population rivaroxaban had the highest incremental net monetary benefit of £453 (£-485 to £1,312) versus LMWH at a willingness to pay at £20,000 per QALY. Dabigatran and apixaban had a negative incremental net monetary benefit; £-1,066 (£-12,127 to £3,191) and £-2,284 (£-11,017 to £2,085) respectively. The results of the TKR population followed a similar trend. Rivaroxaban had the highest