

to develop methods for obtaining unit prices for the valuation of ICBs.

Methods. By conducting an exploratory literature study and expert interviews, several generic methods were developed. The methods' feasibility was assessed through application in the Netherlands. Results were validated in an expert meeting, which was attended by policy makers, public health experts, health economists and Health Technology Assessment (HTA) experts, and discussed at several international conferences and symposia.

Results. The study resulted in four methods, including the opportunity cost method and valuation using available unit prices, self-constructed unit prices or hourly labor costs.

Conclusions. The methods developed can be used internationally and are valuable for the broad international field of HTA.

PP36 Inflammatory Bowel Disease: The Disability Costs Among Italian Workers

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Introduction. The aim of the study is to estimate the disability insurance costs (social security system in Italy is financed by public expenditure) induced by patients with Inflammatory Bowel Disease (IBD) and specifically for Crohn's disease (CD) and Ulcerative Colitis (UC) between 2009 and 2015.

Methods. We analyzed the database about the disability insurance awards and the mean cost per benefit of the National Institute of Social Security (INPS) for two types of social security benefits: incapacity pensions (IP - for people without workability) and disability benefits (DB - for people with reduced work ability). From this data, we have estimated the total benefit provided and the total costs for each disease. A probabilistic model with a Monte Carlo simulation was developed in order to estimate the total benefits provided and costs.

Results. For CD, an average of 820 beneficiaries of social security benefits were detected per year (2009-2015): the total expenditure was EUR 50 million, EUR 7 million per year (about EUR 7,900 per patient); for UC, about 1,550 beneficiaries per year were detected and the total expenditure was EUR 93 million, EUR 13 million per year (about EUR 8,600 per patient).

Conclusions. The disability insurance costs related with the management of CD and UC showed a significant impact on the expenditure for the Italian system: the most important costs for disability for CD and UC in Italy in the analyzed period were DB (92 percent for CD and 95 percent for UC). Rapid access to innovative treatments could reduce the costs incurred by the social security system.

PP38 Productivity Loss In Patients With Chronic Diseases: A Pooled Analysis

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Introduction. Due to the unprecedented increase in medicine prices in recent years, the socio-economic perspective started gaining importance in health economic evaluations. Productivity loss evaluations provide a long-term economic impact visualization for a more informed reimbursed medicine decisions.

Methods. A pooled analysis of patient-level data from 11 cross-sectional, retrospective, cost-of-illness studies was performed. SPSS software was used for our statistical analysis. Analysis of variance (ANOVA) and correlation analysis were utilized to measure the effect of different variables on lost productivity hours. All costs were recalculated to account for the cumulative inflation till 2018.

Results. The sample size of included studies ranged between 68 (Multiple Sclerosis) and 480 (Diabetes), and the total number of patients enrolled in the analysis was 1,881 of which 956 were female. A total of 6,795 hours were reported as missed working hours per year. Overall, the female population reported a mean of 689.5 lost productive hours compared to 324.7 in males ($p < 0.001$). This translated into higher indirect costs at EUR 2,748 and EUR 1,530 for females and males, respectively. Patients with a college degree or higher reported lower yearly lost productive hours and indirect costs (358.4 hours and EUR 1,749) ($p < 0.001$) compared to patients with lower education level (845.6 hours and EUR 3,534) ($p < 0.001$). The average indirect cost as a percentage of gross domestic product per capita was highest in Schizophrenia patients at 97.5 percent and lowest in Benign Prostatic Hyperplasia at 1.9 percent. In patients below 65 years of age, a weak positive correlation was observed between age and lost productive hours with a Pearson value of 0.1 ($p < 0.001$).

Conclusions. Female gender and older age resulted in higher productivity loss, and Schizophrenia was the disease with the highest indirect costs per patient per year.

PP39 Budget Projections And Health Impact Of PD-1/PD-L1 Inhibitors

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Introduction. The rapid expansion of immuno-oncology treatment options has led to concerns around their long-term affordability. Evidence on the potential budget and health impact of these new treatment options is required to inform public health policy and ensure adequate allocation of budget for the future.

Methods. The Health Impact Projection model was developed to compare the economic impact and health outcomes observed with and without PD-1/PD-L1 inhibitors using traditional budget impact analysis. Seven types of high-incidence cancers were included: melanoma, first- and second-level non-small cell lung, bladder, head and neck, renal cell carcinoma, and triple negative breast. Inputs were based on publicly available data and literature, and over 10 key experts (oncologists, health economists) were involved in the model development. The model draws on five-year budget impact analysis.

Results. Using the experience of Belgium, Slovenia, Switzerland, and Italy, the model estimates budget and health impact of the PD-1/PD-L1 inhibitor class. It shows that for 2018-2022, the

class will provide additional life years and avoid high-grade adverse events (AEs) with a manageable budget impact per year compared to the standard of care. The model also enables policy-makers to assess the adequacy of their budget for the near future and explore the implications of different policy decisions. Results for Belgium show that over the five-year period the PD-1/PD-L1 inhibitors will save 10,635 additional life years, avoid 7,597 AEs and have a budget impact of approximately EUR 260 million. Results for Slovenia show 1,468 additional life years gained and 869 AEs avoided with a budget impact of approximately EUR 116 million; for Switzerland, 6,775 life years gained, 6,953 AEs avoided, and EUR 106 million budget impact; and for Italy, 5,019 life years gained, 2,040 AEs avoided, and EUR 627 million budget impact.

Conclusions. Although limitations exist, the model informs planning by helping quantify the potential impact of immune-oncology treatments on health and budget in different scenarios.

PP41 Cost-Effectiveness Modeling Of Chimeric Antigen Receptor T-Cell Therapies

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Introduction. This study has two key aims. The first is to review cost-effectiveness (CE) models for chimeric antigen receptor T-cell (CAR-T) therapies that have been appraised by health technology assessment (HTA) authorities. The second is to identify the key challenges of CE modeling of CAR-T therapies based on the main points raised in the HTA appraisals.

Methods. A targeted HTA review of published CE models for CAR-T therapies in the United Kingdom (UK) and United States (US) was undertaken.

Results. Four relevant CE models were identified – three from the UK and one in the US. Of the three UK models, two were single technology submissions to the National Institute for Health and Care Excellence (NICE) and one was a ‘mock’ appraisal undertaken by NICE with a hypothetical evidence dataset. The one US model was published by the Institute for Clinical and Economic Review (ICER) committee. Two key model structures were adopted across the appraisals: a three-health state partitioned survival analysis model and a short-term decision tree followed by a three-health state partitioned survival model. The key modeling challenges identified can be summarized into five main categories: comparator evidence generation, estimation of long-term survival, curative benefit, health-related quality of life, and infrastructure/training requirements.

Conclusions. There are many challenges associated with the CE modeling of CAR-T therapies, with the most critical issues related to how uncertainty for long-term efficacy and safety can be addressed and mitigated. With more mature evidence sets in the future, stakeholders will get a clearer picture for the long-term benefit and risk of CAR-T therapies, but until then it is likely that HTA authorities will take a conservative stand when appraising the comparative value of CAR-T therapies.

PP43 Decision-Making Tool In Case Of Beta-Lactam Allergy: How To Help Clinicians?

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Introduction. Beta-lactams (BLs), especially penicillins, are the most commonly used antibiotics, particularly in primary care, and one of the most reported drug allergies. Fearing cross-reactivity, clinicians refrain from prescribing another BL (e.g., cephalosporin or carbapenem) to penicillin-allergic patients. This can have significant consequences for the patients and the health-care system (e.g., exposure to broad-spectrum antibiotics, increased risk adverse effects, and increased healthcare costs).

Methods. To assess the absolute cross-reactivity risk, two systematic reviews with meta-analysis were conducted. Then, an approach based on a knowledge mobilization framework considering scientific, contextual and experiential evidences was used. Focus groups with stakeholders, including primary care clinicians, pediatricians, infectious disease specialists and allergists/immunologists, were also held to meet the needs of all actors concerned.

Results. Following this work, it appears that true allergies to penicillin are very rare. Indeed, in patients with a history of penicillin allergy, very few are truly allergic and thus the risk of cross-reaction with another BL is even lower, varying according to structural and physicochemical similarities with alleged-penicillin. Moreover, the risk of having an anaphylactic reaction after penicillin exposure is very low, especially among children. As well, in patients with confirmed penicillin allergy, the observed reactions are usually delayed non-severe skin reactions. However, with a confirmed penicillin allergy, it is important to remain cautious when administering a new BL, especially if the initial reaction was serious or severe. Based on these key messages, a decision aid including an algorithm was developed. Likewise, individualized algorithms for common infections met in primary care were produced.

Conclusions. From this work, health professionals non-specialized in allergology should be able to better manage the risks attributed to penicillin allergies. Therefore, patients should receive the most effective and safe antibiotics to treat their clinical conditions in primary care.

PP44 Optimal Use Of Warfarin: Self-Monitoring From A Quebec Perspective

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Introduction. Frequent standard International Normalized Ratio (INR) monitoring by health professionals is one of the major inconveniences reported by warfarin users. However, portable coagulometers are now available to reduce this burden by allowing patients to self-monitor their INR in the comfort of their home,