OP1. COST-EFFECTIVENESS OF HPV DNA DETECTION IN ADDITION TO OR AS ALTERNATIVE FOR CYTOLOGICAL SCREENING FOR CERVICAL CANCER

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Background: We assessed the performance of high-grade disease detection and costs by adding HPV-DNA-testing to liquid-based cytology, in a triage setting or in a general screening situation. In triage, HPV-tests are offered only to women showing minor cytological lesions. In primary virological screening HPV-DNA detection is applied to all women.
Methods: Four screening strategies were compared: a) cytological screening; b) cytological screening + HPV-triage; c) HPV screening only; d) combined cytological + HPV-screening. The outcome was detection of histologically confirmed CIN2+.
Data were derived from a RCT conducted at the University of Brussels. Costs, including cytological testing and further diagnostic follow-up, were computed using the perspective and tariffs of the Belgian National Health-Insurance Institute. Costs for HPV testing by the Hybrid-Capture assay were estimated in the Department of Virology, University of Leuven.
Results: The detection rate of CIN2+ for cytological screening was 7.7/1000 at an average cost of 37.9 € per screened woman or 4 892 € per detected case. The detection rate increased to respectively 12.4, 14.7 and 16.4/1000 by applying strategies b, c and d. The incremental cost-effectiveness ratios referenced to the baseline strategy were 1181 €, 9447 € and 11945 € per additional CIN2+ case detected. Sensitivity analyses using tornado-diagrammes identified the proportion of HPV-positives, specificity of HPV-testing and price of HPV-tests as most influential variables.
Conclusion: Liquid-based cytology, followed by HPV-triage in case of minor cytological lesions, increases sensitivity for CIN2+ detection substantially at a reasonable extra cost. Ancillary HPV testing of all women still increases the yield but at a very high cost. This cost-effectiveness analysis will be extended when more longitudinal results will be available. Of course, the extra costs generated by adding HPV testing must be balanced by the possibility of increasing the screening interval in HPV-negative women. Nevertheless this increase in interval should also be accompanied by a substantial reduction in cost to make general HPV-detection, alone or with cytology, a cost-effective screening strategy.

OP2. AN ECONOMIC EVALUATION OF INTERSTITIAL BRACHYTHERAPY, RADICAL PROSTATECTOMY AND EXTERNAL BEAM RADIOTHERAPY FOR LOCALIZED PROSTATE CANCER: PRELIMINARY RESULTS: 6 MONTHS AFTER THE THERAPY

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The objective of this study was to compare interstitial brachytherapy (IB), an innovant treatment for localized prostate cancer, with radical prostatectomy (RP) and external beam radiotherapy (EBRT) in terms of quality of life (QOL) outcomes and costs.

Between March 2001 and June 2002, 545 localized prostate cancer men were included in a french multicenter cohort (RP:126, IB: 307, EBRT: 112). A cost-consequence analysis was conducted during the 6 months after treatments from a societal perspective. The EORTC QLQ-C30 and QLQ-PR25 questionnaires and a morbidity questionnaire were used to compare change in QOL after various treatments. An analysis of covariance was conducted on QOL measures. Mean hospital costs were calculated through a specific hospital resource utilization instrument, the hospital's cost-accounting systems for IB and EBRT and through the Diagnosis Related Group data for RP. Mean ambulatory costs were evaluated on the basis of the French National Security fee schedule. Days lost from work were also explored.

QOL was superior after IB when compared with the other therapies, at the end of treatment.

However, this advantage disappeared at 2 months; at 6 months, QOL after IB was inferior, due to persistance of urinary symptoms. Although mean treatment costs were slightly higher in the IB group than in the other groups, total hospital costs of IB (7631 €) and RP (7296 €) did not differ significantly ($P = 0{,}08$) because of less hospitalizations for complication in the IB group. Ambulatory costs were higher in the IB group (296 €) than in the RP group (229 €). For working patients, mean lost production costs were of 522 € for IB versus 2 668 € for PR.

Although the societal costs did not differ between IB and RP, the QOL advantage of IB was not established during the 6 months after treatment. Furthermore, EBRT was the least expensive strategy with the best QOL results. Data at 1 and 2 years of follow-up are still awaited to continue the study.

OP3. A FRAMEWORK FOR MODELLING AND PRESENTING THE COST-EFFECTIVENESS OF ADJUVANT SYSTEMIC THERAPY FOR WOMEN WITH EARLY BREAST CANCER

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Background: In the UK prognostic information is routinely used to select women with early breast cancer for whom adjuvant systemic therapy may be effective. Given the continually increasing constraints on health care resources, an argument can be made for individualising patient treatment on the basis of cost-effectiveness rather than effectiveness criteria alone. This paper presents a framework for modelling and presenting the cost-utility of adjuvant systemic therapy for women with early breast cancer.
Methods: A decision analytic framework was constructed to facilitate a comparison of costs and quality adjusted life years (QALYs) of chemotherapy plus tamoxifen (if oestrogen receptor positive) versus tamoxifen alone. Prognostic and predictive factors were identified by modelling patient specific survival data obtained from the Medical Oncology Unit of the Churchill Hospital in Oxford. This model was supplemented by life table data to generate life expectancy estimates. Published literature provided estimates of treatment relative risks, utilities, costs, and side effect probabilities for the economic model. Simulation was used to estimate an incremental cost per QALY for each of the possible combinations of prognostic and predictive factors identified. A risk table format was used to present the results.
Findings: An exponential model was fitted to the survival data. Independent variables comprised tumour stage, grade and size, woman's age, and oestrogen receptor status. Tumour size and age were banded for the purposes of constructing cost-effectiveness tables. 648 individual incremental cost-utility ratios were generated. These results were presented in tabular form and colour coded to signify prognoses for which tamoxifen plus chemotherapy was dominating, dominated or generated positive incremental cost-utility ratios above and below £30,000 per QALY.
Implications: Presenting results of an economic evaluation in such a way provides the clinician with a tool to directly observe the implications in terms of cost-effectiveness of decisions to treat women with varying prognoses.

OP4. COUNTRY AND CENTRE-SPECIFIC RESOURCE USE AND COST ANALYSIS IN A MULTINATIONAL CLINICAL TRIAL USING MULTILEVEL MODELLING

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Background: There is an increased interest in international clinical trials that incorporate economic evaluations, although such studies are notoriously difficult to conduct and to interpret. One major problem concerns the interaction between country-specific effects and costs and centre-specific practice variations in multicountry trials.

Objective: The objective of this study is to estimate country-specific differences in medical resource use and costs using data from an international clinical trial with 8 countries and 58 centres in advanced colorectal cancer (EORTC 40952) where resource use was prospectively collected alongside clinical data.

Methods: Clinical trials have a naturally hierarchical structure from patient level up to country level with most clustering appearing at centre level. Therefore one would expect observations ie responses to be correlated at several levels within the clusters. Multilevel or hierarchical regression methods have been developed to take into account this covariance structure. We applied a two-level multilevel regression model using the MlWin software package to counts and costs of resources used.Individual and centre variation was defined by random effects while country and treatment arm were defined as fixed effects.
Resources were analyzed either as counts or as binary variables and cover hospital admissions, hospital days, chemotherapy dose, radiotherapy sessions and surgery.

Results: Compared to a single level approach with country as fixed effect in most cases country effects were no longer significant except for the occurrence of surgery in the multilevel regressions.

Discussion: In this international trial, apparent country-specific effects disappeared when random variation between centres was controlled for. This raises the problem of the representativeness of the centres within each country as self-selection of centres can not be excluded in clinical trials. Also the influence of the often small number of centres per country and number of patients per centre needs to be assessed further in the multilevel approach.

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OP5. ESTIMATED COSTS OF OVERDETECTION IN PROSTATE CANCER SCREENING

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Introduction: Screening for prostate cancer will also detect cancers that would not have been diagnosed without screening (overdetection). The share of overdetection costs, due to initial screening and subsequent medical costs, in total costs for relevant cancers is an important factor in determining the cost-effectiveness and desirability of a screening programme. We derived calculations for costs and overdetection for Rotterdam, one of the eight participating centres in the European Randomised Screening for Prostate Cancer (ERSPC) trial. The control and screen arm in the trial are 21.166 and 21.210 men respectively.

Methods: By using MISCAN, Prostate Specific Antigen screening was simulated to evaluate the effects. We estimated the probability of being detected by PSA screening for one individual man and the overdetection rate as a percentage of this detection probability.
The screened individual has either cancer (relevant or irrelevant (=overdiagnosed)) or no cancer and is considered as the weighted individual of all screened individuals.
Total costs are the combination of screening costs (identification, randomisation, blood sample taking and PSA-determination) and subsequent medical costs. These medical costs consist of: diagnosis (biopsies, research by a pathologist and GP consulting), primary therapy (stage determination, therapy (radical prostatectomy, radiotherapy or watchful waiting) and follow-up)) and advanced disease (palliative therapy).

Results: Four screening programmes we evaluated; yearly screening within interval 55–67 years, yearly screening within interval 55-75 years and 4 yearly screening for the same intervals. The probability of being detected by PSA screening for one individual man was 0.103, 0.140, 0.087 and 0.123, respectively, whereas overdetection was 50%, 56%, 48% and 54%.
Finally, the related costs will be presented.

OP6. THE COST-EFFECTIVENESS OF ADDING ORAL CAPECITABINE TO DOCETAXEL IN THE TREATMENT OF METASTATIC BREAST CANCER IN THE UK

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Objectives: To demonstrate that oral capecitabine in addition to docetaxel is cost- effective for the UK health system.

Methodology: The model used to assess the cost- effectiveness of capecitabine as a combination treatment versus monotherapy is based on a prospective data collection of costs and effect within a pivotal clinical trial. The measurement of cost- effectiveness is defined as an incremental cost per quality adjusted life years gained and is based on an analysis of stable, progression and death health states. The model included drug acquisition costs for treatment and adverse events, hospitalisation costs for adverse events, and consultation costs.
Utilities were not collected alongside the trials and were therefore sourced from several published sources (Launois *et al.*, Brown et al[1].).
One and two- ways sensitivity analyses were conducted on medical resource use, duration of progression free survival, and utility scores.

Results: The total drug acquisition cost for the docetaxel and combination arms were respectively £6,685 and £6,531. No increase in the cost for the treatment of adverse events were found. Costs of consultation increased from £328 to £534 for the combination arm.
Patients on the combination arm benefited from a mean additional 83 days of survival and a mean additional 66 days in a stable health state.
These results show that the addition of capecitabine to docetaxel for the treatment of metastatic breast cancer is not only cost- effective, but also cost- saving (cost per QALY of −£1,034) even when varying parameters in the sensitivity analyses.

Conclusion: In most instances the addition of oral capecitabine to docetaxel in advanced breast cancer patients who have failed prior anthracycline- containing chemotherapy is dominant with increased survival and reduced cost.

[1]Launois *et al.*, A cost- utility analysis of Second- Line Chemotherapy in Metastatic Breast Cancer Docetacel versus Paclitaxel versus Vinorelbine. Pharmacoeconomics 1996; 10(5): 504-21. Brown *et al.*, Cost- Utility Model comparing Docetaxel and Paclitaxel in Advanced Breast Cancer Patients. Anti- Cancer Drugs. 1998; 9: 899–907

OP7. NICE APPRAISAL OF CANCER DRUGS: A REVIEW

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The National Institute for Clinical Excellence (NICE) is a Special Health Authority of the National Health Service (NHS) of England and Wales. One of its main tasks is to advise the NHS on the clinical and cost effectiveness of specific health technologies at the request of the Department of Health and the Welsh Assembly Government.
Among the 80 topics that have been appraised or are currently being appraised, 16 have been of cancer drugs, 5 of which have undergone subsequent review.
There are a number of lessons to be learnt from these appraisals, not the least of which is that cancer is different from many other conditions.

- Cancer still kills most of the people who have the disease, and treatments are either palliative or slow progression.
- The placebo effect, if it exists at all, is usually quite small.
- Drugs in last line are often a patient's last hope, and therefore may be regarded differently in cost effectiveness terms from drugs for most other conditions.
- Multiple treatment pathways

For these reasons, the evidence base for cancer drugs is not always as well developed as it has been for other conditions. The weaknesses in the evidence base are particularly problematic when considering ost effectiveness.
How are recommendations on use made when there is no controlled trial to establish that the drug is effective at all? Or if the only comparative trial is against a drug which is not the standard treatment in the UK? Or when the trials contain patients, at least some of whom have a different condition from the group being appraised? Or when the comparator drug in last line has never been appraised, and may (because of side effects) not be cost effective? What happens when quality-of-life data is poor or non-existent, or when it has statistically significant evidence of a response by the tumour, but not a proven overall survival advantage?
This paper, written by present and former members of the NICE technical team, outlines some of the issues faced and strategies for dealing with them. It discusses how successful these approaches have been, and the lessons that might be applied to new appraisals of cancer drugs.

OP8. ECONOMIC EVALUATION OF A GENETIC SCREENING PROGRAM FOR FAMILIAL CANCER

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The potential for genetic technology to anticipate disease risk is increasing. While this presents enormous potential for improving health outcomes, the economic implications are largely unknown.

A number of mutated genes which predispose to an increased risk of familial cancer have been identified, most notably BRCA1 and BRCA2 for breast and ovarian cancer. Other familial cancers suitable for predictive DNA based testing include hereditary non-polyposis colorectal cancer (HNPCC) and familial adenomatous polyposis (FAP).

To assess the cost effectiveness of screening family members of an identified proband, a decision analytic model has been developed using TreeAge software. This model has the capacity to establish a baseline for comparison with other genetic screening programs and to identify and evaluate the costs and outcomes associated in each case. The dynamic nature of evolving knowledge in genetics can be incorporated into a decision modelling framework, as can the evidence of specific outcomes as the information emerges.

However there are a number of residual challenges in determining the economic impact of these programs across the broader community and within the health budget. These include the potential demand for testing and the intangible issues associated with the knowledge of disease risk. Implications also extend to other family members including future generations.

Within this context, a generic model will be presented which is seen as a first step in evaluating the economic implications of genetic screening for cancer risk. Application to breast, ovarian and colorectal cancers will demonstrate the flexibility of the model, and future challenges in terms of evaluation will be proposed.

OP9. DECISIONS ON CANCER SCREENING PROGRAMMES IN NEW ZEALAND- THE ROLE OF ECONOMICS

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This paper reviews how decisions have been made, to introduce, or not to introduce, national screening programmes for different types of cancers in New Zealand. The process of each decision is analyzed, showing how political pressure, overseas clinical evidence, cost, and cost-effectiveness contributed to the decision. Issues of implementation are raised for the approved national screening programmes, for breast cancer and cervical cancer, with particular reference to New Zealand's mixed public and private health care system, sparsely distributed population and minority indigenous population. The current status of these national screening programmes is discussed, with respect to their potential effectiveness and cost-effectiveness. The status of the decision is reviewed for programmes not approved, including colorectal cancer and prostate cancer. The conclusion is that for evidence-based decision-making, the processes for using evidence of effectiveness and cost-effectiveness are at least as important as the generation of the evidence itself. These processes need to be robust enough to withstand political, industry or consumer pressure to mount a programme, in the face of opposing evidence. Following a decision to mount a programme, equivalent processes are required for successful implementation.

OP10. COST-UTILITY OF RITUXIMAB (MABTHERA®) IN DIFFUSE LARGE B-CELL LYMPHOMA

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The cost-utility of rituximab (MabThera®) in diffuse large B-cell lymphoma was considered as part of a UK National Institute of Clinical Excellence regional evidence-based appraisal process. After eight cycles of either rituximab plus CHOP (R-CHOP) or CHOP alone, the complete response rate had increased significantly by 21% (76% in the R-CHOP group compared with 63% in the CHOP group, $P=0.0137$). The addition of rituximab to CHOP significantly decreased the risk of progression and death by approximately 50% over a three-year period (risk ratio for time to progression 0.47 [95% confidence interval, 0.31–0.71] $P=0.0002$; risk ratio for time to death 0.52 [95% confidence interval 0.32–0.84] $P=0.0069$). The effect of increased complete response rate and reduced risk of progression/death are predicted to increase mean survival of patients aged $\geqslant 60$ years with diffuse large B-cell lymphoma by two years, from 5.2 years for CHOP alone to 7.2 years for R-CHOP; increase in survival, 5th and 95th percentiles [1.27,3,19]). The cost-utility (cost per quality-adjusted life-year gained) of R-CHOP is less than £7,000, with 95% of simulations having a cost-utility ratio less than £13,000. For patients aged 60 years or less, the cost-utility of R-CHOP is estimated to be less than £8000, based on similar assumptions as used in the analysis but also including the resource implications for bone marrow transplantation. The GELA LNH 98.5 trial demonstrated that adding rituximab to CHOP significantly improves survival for elderly patients with diffuse large B-cell lymphoma compared with CHOP alone. Therefore this economic analysis shows that R-CHOP is indeed cost-effective for the treatment of patients with diffuse large B-cell lymphoma, providing good value for money for the UK National Health Service.

OP11. TREATMENT COSTS OF BREAST CANCER RECURRENCE AND DEATH BY DETECTION GROUP

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Background: A population based mammography screening programme started in 1987 among 36,000 women aged 40–74 years in the city of Turku Finland. The objective of the study was to evaluate differences in hospital and outpatient treatment costs of invasive breast cancer in relation to recurrence and breast cancer death between two detection groups: attenders (screen-detected and interval cancers) and non-attenders (pre-screening cancers and cancers of those who refused screening).
Material and Methods: The study population consisted of all primary invasive breast cancers diagnosed in the city of Turku Finland among women aged 40–74 in 1987–1993. There were 427 cancers among attenders and 129 among non-attenders out of 556. The follow-up was five years from diagnosis. Treatment costs (in Euros) were based on average costs calculated per year for inpatient hospital days and outpatient visits at different hospital clinics and a private cancer clinic.
Results: The breast cancer recurrence rate among attenders compared to non-attenders was 15% versus 25% ($P=0.018$), breast cancer death rate 8% versus 20% ($P<0.001$), and survival rate 89% versus 72% ($P<0.001$), respectively. The mean treatment cost per patient among attenders compared to non-attenders were as follows: patients with recurrence €18,463 versus €14,277 ($P=0.072$), patients without recurrence €6,334 versus €9,558 ($P<0.001$), patients who died of breast cancer €21.886 versus €19,742 ($P=0.467$), survivors €7,116 versus €8,387 ($P=0.032$), respectively. In an analysis of covariance, differences in the mean costs between detection groups remained after adjustment for recurrence ($P=0.011$) but disappeared after adjustment for breast cancer death ($P=0.216$).
Conclusion: Differences in the mean treatment costs were only slightly related to recurrence, but strongly related to breast cancer death, which together with a more favourable survival rate among attenders explains our previous finding that breast cancer treatment costs are lower among attenders than among non-attenders.

OP12. ESTIMATING SOCIAL PREFERENCE WEIGHTS IN THE ABSENCE OF PRIMARY DATA: THE PREFERENCE FOR ORAL OVER HOSPITAL-BASED THERAPY IN ADVANCED COLORECTAL CANCER

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Background: Estimates of utility weights are demanded for decision-analytic and economic applications. Regulatory bodies require evidence in a form that can be used to establish the cost-effectiveness of new treatments. Social preference weights for cost/QALY calculation will become increasingly valuable in helping guide regulatory approval. However, in circumstances where direct evidence from clinical trials is not available there are limited options in generating appropriate weights for quality-adjustment.

Methods: A sample of 3000 names and addresses were drawn from national electoral registration data in England and Wales. Selected individuals received a questionnaire designed to capture preferences for 4 treatment scenarios previously developed using patient focus groups. Linked tasks within the questionnaire included ranking and rating common symptoms as well as visual analogue scaling (VAS) of preferences for treatment. The questionnaire also included EQ-5D. A total of 349 completed questionnaires were received yielding a total confirmed response rate of some 25%.

Results: Diarrhoea and nausea/vomiting were regarded as the most significant symptoms and hair loss and sore hands/feet were the least significant. 52% of respondents considered that cancer treatment should be received in a patient's home environment whereas 21% preferred hospital. Median values for the treatment scenarios indicated a marked preference for oral, home-based therapy (median = 0.50) over hospital-based therapies (medians between 0.22 and 0.33). Results from conjoint analysis of the VAS data confirmed these estimates.

Conclusion: It is feasible to derive estimates of social preferences independently of a clinical study. However, the acceptability of such estimates remains to be established. In studies of advanced disease, where the prospective investigation of quality of life may be problematic, a proximate methodology such as that reported here may prove to be the most acceptable mechanism for establishing social preferences.

OP13. BURDEN OF CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING IN THE CONTEXT OF CURRENT CANADIAN PRACTICE

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Background: Chemotherapy-induced nausea and vomiting (CINV) is associated with major side effects in cancer treatment, particularly with highly emetogenic chemotherapy treatments.

Objective: To estimate the cost associated with lost productivity due to CINV in the context of current practice in Ontario and Quebec.

Methods: Patients scheduled to receive a highly emetogenic chemotherapy regimen (level 5 on the Hesketh scale) were recruited from three oncology centers. They were provided with a 5-day dairy to determine the extent of CINV. To reflect current practice, no specific antiemetic regimen (prophylactic or rescue) was imposed in this study. Patients received the antiemetic treatment as normally prescribed by their physician. They were asked how many hours during the 5 day-period they were unable to carry out normal activities because of CINV and for how many hours they needed help from another person because of CINV. The average wage rate for total employees, for all occupations in Ontario for 2000 was used to estimate the cost of this diverted time.

Results: Of the 142 patients recruited so far, 129 (91%) completed and returned their dairy. During the five days following the chemotherapy, 43% of patients reported vomiting (V) or significant nausea (N). Those who experienced N or V were on average unable to carry out their daily activities for an average duration of 17.3 hours (SD = 25), because of their symptoms. Also, friends or relatives of these patients had to spend an average of 8.5 h (SD = 20) to help these patients because of N or V. This represents an average cost of $423(CDN) per patient who experienced CINV.

Conclusion: Despite modern antiemetic treatments, CINV is still a significant clinical problem in Canada with important financial impact.

OP14. "RECEIVER-OPERATOR CURVE EXPANSION FUNCTIONS" COULD SYNTHESISE ECONOMIC EVALUATION OF CANCER DIAGNOSTICS AND TREATMENTS

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There is a growing literature exploring the benefit of allocating health-care interventions to subgroups within conventionally defined populations. For example, Coyle et al estimate the advantage of stratification of cost-effectiveness analyses (Health Econ (in press)). We have built a flexible model that can be used to evaluate alternative treatments and diagnostic criteria for heterogeneous populations. Given two interventions A and B, we hypothesise a set of diagnostic indicators "D_i" that would rank individuals in order of the predicted difference in effect between A and B. The expansion function AB for any given D_i would be the translation of its receiver-operator curve (ROC) into cost-effectiveness (CE) space. In contrast to previous models of expansion these functions may be non-linear. The optimal operating point (OOP) on the ROC corresponds to the point on AB that yields the maximum expected net benefit, which is defined for some given cost-effectiveness threshold. A conventional analysis might recommend universal implementation of B if its overall incremental net benefit is positive. A stratification method might limit implementation to known subgroups in which the incremental net benefit is positive. Our method would recommend implementation according to the test D_i whose OOP maximised ENB. We think our approach may have several advantages, including (1) conservation of information (and analytical effort), since "strata" are re-expressed as smooth population functions; (2) seamless incorporation of ROC-optimising routines such as that of Metz (Semin Nucl Med, 1979; 8(4):283-98); (3) improved comparison of new diagnostic technologies; (4) more realistic quantification of the benefits of "clinical freedoms" associated with expert diagnosis and patient preference. We illustrate our approach by comparing a set of "ROC-linked expansion functions" for use of adjuvant chemotherapy in breast cancer. We have used the method to evaluate diagnostic tests including DNA microarrays and the conventional St Gallen criteria.

OP15. ORAL VINORELBINE IN THE TREATMENT OF NON SMALL CELL LUNG CANCER

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Objectives: Since May 2001, vinorelbine has been available to be administered in oral form at home in the treatment of non small cell lung cancer. Its efficacy is similar to that of IV vinorelbine, gastro-intestinal toxicity are more frequent. the periodicity of the treatment follow up in a hospital environment is poorly defined. The aim of this study is to establish the regimen which minimises costs whilst ensuring patient safety.
Methods: A model was constructed in order to follow the repercussions of attending hospital every 3, 6 or 9 weeks compared to purely outpatient, weekly management. The corresponding costs were compared to those of conventional treatments used in the indication: gemcitabine, docetaxel and paclitaxel. Costs were estimated from the society perspective. For hospital courses, the DRG costs was adjusted by replacing the drugs component by the actual cost of the substances. For the oral form, primary care costs are allocated values using the price of oral form and the primary care visit or an hospital specialist consultation.
Results: For equivalent therapeutic efficacy, oral vinorelbine appears to be the least expensive substance: its annual follow up costs per patient using specialised consultations every 3, 6 and 9 weeks were 6360, 6190 and 5940 euros. The least expensive regimen was the regimen involving entirely home management following initial day hospitalisation: 5940 euros. IV cytotoxic agents administered in hospital: gemcitabine, vinorelbine, docetaxel and paclitaxel had annual follow up costs of 6970, 7400, 8320 and 9440 euros respectively.
Conclusion: How can patient safety and the will to keep a patient at home at the end of their life be reconciled? An economic analysis can quantify the financial repercussions of the more or less extensive interpretations which clinicians place on the principle of precaution.

Keywords: non small cell lung cancer; first line; primary care management; medico-economic analysis.

OP16. RE-ESTIMATING THE COST EFFECTIVENESS OF LIQUID BASED CYTOLOGY USING THE RESULTS OF A UK PILOT STUDY

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Objectives: Liquid Based Cytology (LBC) uses an alternative slide preparation technique to Pap smears to screen for cervical cancer. In 2000, a Health Technology Assessment was commissioned to evaluate the clinical and cost effectiveness of LBC in the UK. Bayesian methods were used to estimate the expected value of perfect information of key model parameters. The marginal costs of LBC, the costs of conventional smears and rates of inadequate samples were identified as key areas of uncertainty. Using data from three pilot site laboratories that were converted to LBC, we determined new estimates of these parameters and re-estimated the cost effectiveness results.
Methods: Data were collected using record sheets, questionnaires, and semi-structured interviews to estimate the cost per test using the Pap smear and LBC. Data were collected for the pre-pilot and pilot year on the rates of inadequate smear results. We updated the model with our new estimates of costs and inadequate rates, retaining existing baseline estimates for all other model parameters.
Results: Our estimates of the marginal cost of LBC compared to conventional cytology varied from an increase of £1.47 to a saving of £0.92 depending on the technology used. These results were sensitive to our estimates of reductions in smear-taking time in primary care with LBC and the market price of consumables. LBC reduced the number of inadequate smears from 9 to 1.6%. In cost-effectiveness terms, these results indicate that LBC is either cost saving compared to conventional cytology, or costs an additional £270 per life year saved.
Conclusion: Our results indicate that Liquid Based Cytology is cost effective compared to conventional cytology. However, uncertainty remains about the extent of time-savings in primary care, the market price of consumables and the extent to which LBC improves sensitivity compared to conventional cytology.

OP17. A COST EFFECTIVENESS ANALYSIS OF CERVICAL CANCER SCREENING STRATEGIES IN INDIA

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Background: In many developing countries, cytology based cervical screening at regular intervals to prevent cervical cancer has proved too costly and difficult to implement effectively. A number of once a lifetime alternatives exist with a lower cost, including visual examination of the cervix with acetic acid (VIA), cytology and testing for Human PapillomaVirus (HPV).
Objective: To assess whether a significant reduction in cervical cancer incidence and mortality could be achieved by these lower cost interventions, and to assess their comparative cost effectiveness.
Study design: A total of 115,000 eligible women in 52 clusters of villages in rural India have been randomised between three intervention groups and a control group. The screening approach is 'screen, diagnose and treat'. The diagnosis is based on colposcopy and biopsy. In the intervention groups, mobile clinics are used to screen women in the villages. In the VIA group, screen positive women are diagnosed at the same visit. In the cytology and HPV testing groups, screen positive women are recalled for diagnosis at a tertiary centre. All treatments are conducted at the tertiary centre.
Methods: Here, we present the results of an interim analysis using data on the first 51, 973 women screened. All resources used in recruitment, detection, follow up investigations and treatments were identified and unit costs estimated. These unit costs were then allocated by trial arm depending on utilization to calculate total costs. Total costs for the interim analysis were combined with detection rates to calculate the incremental cost per High-grade Squamous Intraepithelial Lesion detected.
Results: Initial analysis indicates that, although VIA screening has the lowest detection costs it is also associated with higher rates of follow up investigations than in the other groups. HPV testing is the most expensive intervention due to high costs of consumables and equipment. Cost effectiveness results are sensitive to both detection costs and strategies for follow up investigation and treatment.

OP18. COST-EFFECTIVENESS ANALYSIS OF FAECAL OCCULT BLOOD SCREENING FOR COLORECTAL CANCER

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Clinical trials have demonstrated that faecal occult blood test (FOBT) screening for colorectal cancer can significantly reduce mortality. To be deemed a priority from a public health policy perspective, any new programme must prove itself to be cost-effective. A cost-effectiveness analysis using the Markov process was performed on a population of 100,000 individuals between 50 and 74 years old and over a 20-year period. The population was allocated either to FOBT screening or no screening. Clinical results of the Burgundy trial (France) were used together with economic data collected during this trial. The analysis was carried out from the viewpoint of the National Health Insurance System. All costs and effectiveness were discounted using an annual 3% rate. Modelling biennial screening versus the absence of screening resulted in a 17.7% mortality reduction and an incremental cost-effectiveness ratio (ICER) of 3492 [EURO] per life-year gained (LYG). Sensitivity analyses performed on several starting and ending ages at screening suggested that a biennial Hemoccult-II test could be recommended from the age of 50 until 74. Sensitivity analyses also showed the strong impact on the results of colorectal cancer treatment costs: the use of the highest level of treatment costs increased the cost-effectiveness baseline value from 3492 € per LYG to 5442 € per LYG. Variations of compliance to screening were also tested. With a 10% increase in the participation rate, mortality reduction reached 22.3% and the baseline cost-effectiveness ratio was reduced by 17.8%. Similarly, results were strongly influenced by the FOBT specificity. Results showed that, with 90% specificity instead of a 98% baseline rate, the ICER increased by 42.0%.
Our findings indicate that biennial screening for colorectal cancer with faecal occult blood testing is cost-effective and supports attempts to introduce large-scale population screening programmes.

OP19. COST-EFFECTIVENESS ANALYSIS OF BREAST CANCER ADJUVANT TREATMENT: FEC50 VERSUS FEC100

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The aim of the study was to assess the incremental cost-effectiveness ratio (ICER): FEC50 versus FEC100 as compared in FASG05 trial.
Methods: A cost-effectiveness analysis was performed using a multi-states Markov process model. Relevant clinical data introduced into the model were obtained from 10-year follow-up clinical trial (FASG05). Survival curves for each health state were assessed by survival parametric model. The model allowed assessments from the start of adjuvant chemotherapy until death. The costs of adjuvant treatment and follow-up were estimated. The costs of recurrence were evaluated from the medical records of 125 patients. A prospective survey was performed on a cohort of patients to quantify the resources external to the hospital (including cost of transportation). The inpatient costs were evaluated using the French Diagnosis-related groups. The ambulatory costs were assessed using the French nomenclature. Costs were expressed in 2002 Euro, according the French societal perspective. The ICER assessed the cost of one additional life year saved. An discounting rate of 5% per year was used for costs and alternatively 0, 3 and 5% for effectiveness. We validated the results with a probabilistic sensitivity analysis incorparating parametric and non-parametric bootstrap, and the acceptability curve.
Results: The mean total discounting cost of adjuvant treatments was 11465 $ for FEC50 and 13815 $ for FEC100, the mean total discounting cost of recurrences 14636 $ and 13503 $ respectively. According to the discounting rate of effectiveness, the life expectancy was 16.5, 11.4 and 9.3 years for FEC50 and 18.4, 12.5 and 10.2 years for FEC100. The costs per life year saved were 642 £, 1084 £ and 1460 £ respectively. The probability according which FEC50 is strictly dominated by FEC100 was equal to 0.15.
Conclusion: The clinical benefit of FEC100 leads to a moderate cost increase as compared to FEC50.

OP20. MODELING OF COSTS OF TELETHERAPY ALTERNATIVES FOR DEVELOPING COUNTRIES

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Purpose: To develop an Activity-Based Costing (ABC) model for predicting the utilisation of equipment and personnel categories and for calculating the cost of external beam radiotherapy using different combinations of treatment machines.

Materials and Methods: Available data on performance and cost of radiotherapy resources were used in the model. Radiotherapy costs were computed for different types of countries (different salary structures and building construction costs) and patient numbers. A product mix of 35% palliative, 35% high grade palliative (HGP) and 30% curative treatments was assumed.

Results: 500 patients irradiated with cobalt and orthovoltage would result in machine utilisation of 72 and 30%, respectively; one linac in 93%. The simulator, treatment planning system (TPS) and mould room (MR) would be used at 30, 26 and 6%.
In case of 1000 patients these numbers would obviously double, requiring to extend the working shifts for linac and cobalt or to hire new equipment.
Personnel requirements (and utilisation) for the cobalt/orthovoltage combination would be 4 radiation oncologists (89%), 1 physicist (90%), 6 technologists (88%) and 1 administrative staff (110%). Treatment with linac would increase the utilisation of the physicist to 96%. Conversely, only 5 technologists would be required (91% utilisation) due to shorter irradiation times.
For 1000 patients treated with cobalt/orthovoltage, the cost of HGP treatments would amount to 474, 676 and 1,479 US$ in least developed (LDC), developing res. industrialised countries. In case of a linac, the comparative costs are 942, 1143 and 1,935 US$.

Conclusion: Small patient numbers result in an under-utilisation of simulator, TPS and MR.
Cost savings achieved per patient by the purchase of less expensive therapy machines (cobalt vs. linac) are more pronounced for LDCs than industrialised countries.
This model provides a useful tool to aid decision-making on equipment selection, shift work, proliferation versus expansion of radiotherapy departments.

OP21. SCREENING FOR LUNG CANCER WITH SPIRAL COMPUTED TOMOGRAPHY: THE ECONOMIC IMPLICATIONS OF POOR TEST SPECIFICITY

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Recent studies demonstrating the potential benefits of helical computed tomography (CT) for lung cancer screening have generated significant interest and increased demand for these services. The economic implications of rapid dissemination of this technology, however, could be significant; false positive results are common often requiring further radiological testing, biopsies, and in some cases surgical intervention. We assessed the direct medical costs associated with follow-up of indeterminate lung nodules in a prospective cohort study of individuals at high-risk for lung cancer (at least 20 pack-year smokers) who underwent four years of screening with spiral CT (prevalence as well as three annual incidence scans). Of the 1520 enrolled participants, 107 were local residents with lung nodules detected at baseline scan who did not have a documented lung cancer during the four years of follow-up. Diagnostic follow-up was tracked in unique population-based administrative data to assess costs associated with these assumed false positive findings. Utilization was valued using standardized, inflation-adjusted 2002 constant dollars. We imputed costs associated with nodule management that occurred outside our local health system noted by patients during phone follow-up. During the first year of follow-up post baseline scan, these participants underwent a total of 187 interval CT scans, 68 scans with traditional radiography, as well as one biopsy. Mean total costs per patient during this initial year were $571 + $256. Utilization and associated nodule management costs decreased during subsequent years of annual incidence screening with estimated mean costs per patient of $470 + $231, $391 + $154, and $337 + $130 in years two, three, and four, respectively. This descriptive cost study provides estimates of the costs associated with an annual spiral CT scanning program in practice. Results suggest that false positive findings have economic impact important to consider in cost-effectiveness analyses comparing lung cancer screening strategies.

OP22. DIRECT COSTS OF PATIENTS TREATED WITH RADIOTHERAPY-CHEMOTHERAPY FOR HEAD AND NECK INOPERABLE CANCER IN PRIVATE SECTOR IN FRANCE

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Data on head and neck cancer (HNSCC) is lacking, especially in France. The objectives of this study were to estimate the costs of inoperable HNSCC patients treated in the private sector and their relationship with patient's medical characteristics.
We conducted a cohort study in one centre to collect medical data from diagnosis until date of last news or death. Reimbursements of medical fees were obtained from the French Sickness Fund. For the private sector, fee for service rules are applied; as a consequence, all types of health care consumptions could be identified. Consumptions were further linked to treatment phases (initial treatment, follow-up, palliative care) and medical events (chemotherapy, radiotherapy, relapse, adverse event...). Logistic regression was carried out to identify which of the medical characteristics (performance, status, staging, age, localisation) were the main cost drivers.
Thirty patients were included and mean duration of follow-up was 13.8 months. Mean total direct costs was 20 752 € per patient, with more than one half for initial radio-chemotherapy (11 399 €) phase, around one quarter for follow-up (4684 €) and the same for palliative care (4669 €). 14 patients died during the study and only 9 received palliative care for an average cost per treated patient of 15 563 €. Type of care distribution varied according to treatment phases with more hospitalisations and medical procedures during initial treatment, more medication during follow-up and more hospitalisation costs during palliative care. Costs of side effects were very high, particularly those associated with mucositis that concerned all patients with a mean cost of 4582 € of which 1607 € for hospitalisation.
Logistic regression highlighted the importance of the nodal staging on the mean total cost per patients and on the daily cost: 35 € for AJCC stage III, 55 € for stage IVa, 93 € for stage IVb patients.

OP23. MULTICENTRIC COMPARATIVE ECONOMIC EVALUATION OF TWO TECHNIQUES AT DIAGNOSIS OF ADULT ACUTE LYMPHOBLASTIC LEUKEMIAS: THE CARYOTYPE AND THE POLYMERASE CHAIN REACTION (RT-PCR)

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This work presents a cost-effectiveness study comparing cytogenetics and molecular analyses for detection of chromosomal abnormalities, which are prognostic factors in acute leukemia. The aim of the study was to give an informed opinion on the optimisation of diagnostic strategies concerning these leukemias and then to determinate how these two techniques could substitute or complement one another. The study sample consisted of 461 patients aged from 15 to 55 years with de novo acute lymphoblastic leukemia, tested by both techniques for identification of translocations t(9;22), t(1;19), t(4;11) and rearrangements in region 11q23 other than t(4;11); the molecular equivalents are: BCR-ABL transcripts (M-BCR and m-BCR), E2A-PBX1 and TEL-AML1(under the age of twenty-five in the LALA94). The criterion for diagnostic effectiveness of these strategies was the rate of detection of true positive anomalies, which are clinically relevant, according to the current state of knowledge. On the basis of theses observations eight strategies at diagnosis were compared (each technique alone and different combinations of the two techniques).The study shows that RT-PCR alone appears the most cost-effective strategy.

Keywords: Caryotype; Polymerase chain reaction; Adult acute lymphoblastic leukemia; Diagnosis; Cost-effectiveness; Optimization

OP24. COST-EFFECTIVENESS OF BICALUTAMIDE (CASODEX™) FOR ADJUVANT TREATMENT OF EARLY PROSTATE CANCER

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Objectives: To assess the cost-effectiveness of bicalutamide (Casodex™) as adjuvant treatment in early prostate cancer from the Belgian health care payers perspective.
Methods: A Markov state transition model was developed over 15 years, simulating the natural history of early prostate cancer. Direct rates of disease progression were obtained from a large ($n = 8113$) early prostate cancer clinical trial programme comparing bicalutamide in addition to standard care with standard care alone. At a median follow-up of 3 years, Bicalutamide was shown to significantly reduce the rate of objective disease progression. Long term outcomes following biochemical and objective disease progression were modelled on the basis of published clinical reports. Utility scores for different disease stages were obtained from published literature. Costs of objective disease progression were obtained from a retrospective patient chart analysis in 6 Belgian centres ($n = 60$).
Results: The model showed good validity in predicting clinical outcomes. At a time horizon of 15 years, incremental cost effectiveness ratio's of 26,195 €/LYG and 23,598 €/QALY were obtained. The main factors influencing conclusions included the time horizon, the duration of bicalutamide treatment which was set at a maximum (5 years) in the basecase and hypothesised differences in prognosis of metastatic cancer between comparators. Also the discounting of effects significantly altered cost effectiveness ratios. Many of these influences are inherently associated with any cost effectiveness analysis related to treatment of early, slowly progressing malignancies. These require sufficient time horizon in order to include not only the treatment costs but its benefits as well. Conclusion: based on the current data, bicalutamide appears a cost-effective option for adjuvant treatment of early prostate cancer.

OP25. DIRECT COSTS ASSOCIATED WITH MALIGNANT NEOPLASMS OF THE SKIN

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Objectives: Although the incidence of skin cancer has dramatically increased over the last decade, there has been limited study of the valuation of resource utilization associated with its medical management. The objectives of this study were to determine the direct costs of malignant neoplasms of the skin and to stratify those costs by type of medical care in the United States adult population.
Methods: Retrospective analysis was conducted of the 1999 Medical Expenditure Panel Survey. The survey provided data from a nationally representative sample of 24,618 respondents and their medical care and health insurance providers. Data utilized in this study included medical conditions and utilization and payments for medical care. Patients with either malignant melanoma or other malignant neoplasms of the skin were identified using relevant ICD-9-CM codes and direct costs were calculated using patient and third-party payments for diagnosis related medical events by type of medical care. Cost estimates were controlled for expenditures associated with other coexisting neoplasms or comorbidities. Sample estimates were weighted and projected to the population and 95 percent confidence limits were calculated using the Taylor expansion method.
Results: The prevalence of skin malignancies was 0.90% (95% C.L. = 0.74–1.06). Direct costs incurred per patient were $857. Total direct costs were $2 130 614 046. The majority of these costs resulted from inpatient stays, at $966 203 715 (mean = $14 948), office-based medical provider visits, at $725 643 386 (mean = $147), and outpatient services, at $383 086 008 (mean = $462). Prescription medications and emergency room visits were $23 930 723 (mean = $27) and $22 103 773 (mean = $291), respectively. Home care services represented the lowest proportion of total direct costs, at $9 646 441 (mean = $270).
Conclusion: Direct costs attributable to malignant neoplasms of the skin were significant, at greater than $2 billion. The principal driver of these costs was inpatient stays, accounting for almost 50 percent of total direct costs, further highlighting the importance of early diagnosis and treatment.

OP26. COST-EFFECTIVENESS ANALYSIS OF TWO CISPLATIN BASED DOUBLETS IN ADVANCED NON SMALL CELL LUNG CANCER IN ROMANIA

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Introduction: Lung cancer remains the leading cause of death from cancer and the great pressure on health care resources determines an economic impact on the therapeutic alternatives so a cost effectiveness analysis of new treatments is necessary. This study provides the first economic evaluation of non-small cell lung cancer (NSCLC) treatment in the Oncological Institute of Cluj-Napoca (OICN), Romania.
Objectives: Evaluation of cost effectiveness of Gemcitabine + Cisplatin (GP) versus Etoposid + Cisplatin (EP) for advanced NSCLC.
Methods: This retrospective study includes 87 previously untreated patients, with stage IV and IIIB with pleural effusion, who received either GP (median 4 cycles) or EP (median 3 cycles). The primary efficacy measure was median survival. The local costs were estimated in US$. Resources used were: pretherapeutic evaluation, chemotherapy drug acquisition, hospitalizations, chemotherapy administration, concomitant medication and healthcare visits.
Results: A significant improvement in median survival occurred with GP versus EP (10.3 vs. 7.1 month, $P < .0353$) and actuarial 1-year survival (39% vs. 14% $P < .05$). The total medical cost/patient during treatment for GP (5130$) was more then double than for EP (2023$). This difference was mainly due to the high cost of acquisition of imported gemcitabine in Romania compared to locally produced cisplatin and etoposide (GP vs. EP = 4480$ vs. 364$). Drug costs represent only a fraction of the overall cost and the others direct medical cost (hospitalization, concomitant medication, including palliative radiotherapy) were higher for EP (1659$) then GP (650$).
Conclusion: These results show that GP for advanced NSCLC patients brings a significant survival benefit compared to EP, but, in our country, these positive results are shadowed by a too high cost of acquisition of the imported 3rd generation drugs.

OP27. INDIVIDUAL NET BENEFIT REGRESSION ANALYSIS OF CHEMOTHERAPY IN ADVANCED NON-SMALL CELL LUNG CANCER (NSCLC)

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Background: Among the advantages of using the net benefit approach to medical economic evaluations rather than the conventional calculation of incremental cost effectiveness ratios is the possibility of applying established econometric analytical techniques to net benefit data on the individual patient level.
Objective: This study presents an econometric analysis of individual net benefit data to determine the explanatory factors and possible subgroups for whom the cost effectiveness of the experimental treatments vary significantly. Such subgroup effects are important for the policy decisions informed by the evaluation.
Methods: Individual patient level cost and survival time data were taken from a previously performed clinical trial based economic evaluation of chemotherapy regimens in patients with advanced NSCLC, comprising three regimens: cisplatin-paclitaxel (standard) versus cisplatin-gemcitabin or gemcitabin-paclitaxel. Individual level net benefit data were generated by assuming a threshold value for the decision makers' willingness to accept cost increases of 50,000 € per life year gained. The analysis was carried out by multivariate OLS techniques. Possible explanatory factors examined are: regimen, patient characteristics (age, sex, performance status, disease stage, histological type), completion of treatment, incidence of serious adverse events, country.
Results: Statistically significant determinants of net benefits common for both comparisons were: completing protocol treatment, absence of serious adverse events, and patient performance status at study start, while patient sex was also found to be significant in the regression for cisplatin-gemcitabine versus standard therapy. But, the contributions of performance status and sex to the R^2 of the model were marginal.
Discussion: This explorative analysis demonstrates that econometric analysis of individual patient net benefit data can be used to identify the most important determinants of the observed variations. Further econometric work, eg using robust regression techniques, is required to corroborate the findings of this OLS analysis. Economic evaluations for subgroups (performance status) status will be performed.

OP28. COST-EFFECTIVENESS ANALYSIS OF GEMCITABINE IN COMBINATION WITH CISPLATIN VERSUS NOVEL COMBINATION CHEMOTHERAPIES IN THE TREATMENT OF NONSMALL CELL LUNG CANCER IN POLAND

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Objective: to evaluate the cost-effectiveness of gemcitabine in combination with cisplatin (GemCis) versus novel combination chemotherapies: vinorelbine with cisplatin (VinCis), paclitaxel with cisplatin (PacCis) and docetaxel with cisplatin (DocCis) in the treatment of patients with nonsmall cell lung cancer (NSCLC) stage IIIB and IV in Poland.
Methods: Model for the Polish health-care context was developed, based on head-to-head clinical trials on efficacy and toxicity of GemCis vs. VinCis (Comella *et al*., 2000) and GemCis vs. PacCis vs. DocCis (Schiller *et al*., 2002) and local data on health-care resource utilisation and unit cost. Only direct medical costs resulting from the chemotherapy (acquisition and administration), concomitant medication and treatment of adverse events were assessed. Information on current treatment practice was obtained from the Polish oncologist expert panel. The perspective of health-care payers and time horizon of 1 year was considered. The outcomes measures were LYG and QALYs gained, calculated on the basis of available evidence on progression-free time. The cost-effectiveness threshold was calculated on the basis of 1-year haemodialysis treatment cost (60 000 PLN, 1 USD = 4 PLN; in 2003). The one-way sensitivity analyses were performed.
Results: Chemotherapy acquisition cost was the major cost factor across all regimens. The highest effectiveness was achieved with GemCis compared to VinCis, and compared to PacCis and DocCis. DocCis was the most costly regime (19°827 PLN) and was dominated by GemCis. Incremental analysis suggests, that GemCis compared with VinCis and PacCis gives additional effects for extra costs below suggested cost-effectiveness threshold: ICERs were 44°035 PLN/LYG in GemCis versus VinCis and 21°336 PLN/progression-free year (60°959/QALY) in GemCis versus PacCis. Results were sensitive to variations to the values of key parameters.
Conclusion: GemCis in the treatment of NSCLC appears to be cost-saving when compared with DocCis and cost-effective when compared with VinCis and PacCis.

OP29. INCLUDING RELAPSE'S COSTS AND OUTCOMES IN COST EFFECTIVNESS ANALYSIS (CEA) OF CANCER TREATMENTS MODIFIES THE RESULTS: EXAMPLE OF AUTOGRAFT VERSUS ALLOGRAFT IN ACUTE MYELOID LEUKAEMIA (AML)

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Background: The aim of our economic and clinical evaluation concerning allograft and autograft of adults with de novo acute myeloid leukaemia was to compare survival and costs during the whole treatment and to provide data on the impact of the relapse treatment and cost associated in each therapeutic strategies. To date, published clinico-economic studies concentrated on a limited period of treatment.
Patients and Methods: We compared retrospectively over twelve years a group of 37 patient allografted to a group of 40 patient autografted treated in a hospital that specialises in the treatment of patients with cancer (Centre Régional de Lutte Contre le Cancer), the Institut Paoli-Calmettes. Patient characteristics are comparable at diagnosis in terms of age, white blood cell count and cytogenetic prognosis. All patients were entered remission after one course of induction chemotherapy.
Direct medical costs were estimated on the basis of the quantities reported in the patient medical records, for the period from induction until the date of patient last news, included relapse. Monetary values were attributed to all these quantities on the basis of unit costs (1999 French francs).
Results: The both therapeutic strategies were statistically similar concerning overall survival and leukaemia free survival. Excluded relapse costs, average total cost (ATC) in autografted group is significantly ($P < 0.01$) lower than that in allografted group (43046€ versus 64651€) whereas including relapse costs, ATC is not significantly different in the both group (57562€ versus 71488€, respectively).
Conclusion: Our clinical and economic comparison shows two equivalent therapeutic strategies with regards to survival and cost. Each strategy presents its intrinsic characteristics: allograft toxicity involves a high rate of remission death (38%) and a low rate of relapse (8%), whereas autograft involves less remission death (2%) and more died relapse patients (40%). Indeed, appreciable differences consist of cost repartition and causes of death (treatment toxicity disease). This study illustrates the need to extend the follow-up of CEA until outcome to avoid misleading conclusions.

OP30. ACCEPTABILITY OF HPV TESTING AS PART OF THE UK CERVICAL CANCER SCREENING PROGRAMME

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Background: Over 99% of all cervical cancers have been found to be associated with various types of human papillomavirus (HPV). However, HPV is very common and most infections are transient, entailing no risk of cervical disease. HPV is typically transmitted sexually and, at present, there is no medicinal, ablative or excisional cure. HPV screening, as part of triage for women with mildly abnormal cervical smears, is the subject of several randomised clinical trials and mathematical modelling studies. Currently, there is little evidence of the perceived value and acceptability of HPV testing within an organised cervical cancer screening programme.

Aim and Methods: A questionnaire survey ($n > 2000$) was conducted on a general population of women in east-central England, to ascertain the value placed on incorporating HPV testing into the NHS cervical screening programme. Willingness to pay (WTP) was assessed using a payment scale instrument, and a sequential approach enabled identification of the relative value of different attributes of the HPV test. Respondents were asked to value the cervical screening programme currently available, followed by incremental WTP valuations based on information about HPV disease and the HPV test.

Results: As an adjunct to the existing cytology programme, HPV testing offers improved sensitivity, enabling earlier and more accurate identification of cervical disease. Subjects attached a significant positive valuation to this improvement. The perceived value of the incremental benefits significantly outweighed the negative aspects of HPV testing, such as fear of identification of sexual behaviour, non-treatment and a high false-positive rate.

Conclusion: HPV testing is likely to be acceptable within an organised cervical screening programme, if clear and simple information about the virus and its relation to cervical disease is provided.

OP31. A COST-BENEFIT ANALYSIS OF OUTPATIENT BLOOD TRANSFUSION IN PATIENTS WITH CANCER

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Objective: Blood transfusions are frequently administered to cancer patients. Concerted efforts by the Leon Berard Comprehensive Cancer Center in Lyon (CLB) and the Blood Transfusion Center have stimulated the development of a local cooperative health network allowing home transfusion. The aim of this pilot study was to assess the cost of outpatient transfusion and its benefit for patients using the contingent valuation method.
Patients and Method: In the CLB in 2002, 40 patients receiving blood transfusions were included (20 at home and 20 in the hospital day ward). Patients' choice and willingness to pay (WTP) for the chosen transfusion place versus the other place was assessed, in face to face interview, with an auction procedure to determine maximum WTP. Reasons for preference, patient characteristics and quality of life were also recorded. Home care and hospital expenses were also identified, and production costs were assessed.
Results: Of 40 patients, mainly patients receiving palliative treatment for solid tumors, 32 expressed a preference for transfusion at home versus 8 for hospital day ward. The first results show that the mean WTP was 70 € for home transfusion vs. day ward transfusion and 58 € for day ward transfusion versus home transfusion; mean costs were 230 € for home transfusion and 165 € for day ward transfusion.
Discussion: The advantage of the development of home transfusion will be developed, however it seems already that home transfusion is largely preferred by patients and may be a useful addition to capacity in situation of limited capacity in day wards.

Keywords: Home care; Cost-benefit analysis; Blood transfusion

OP32. THE HANDLING OF UNCERTAINTY IN COST-EFFECTIVENESS ANALYSIS: APPLICATION TO THE BREAST CANCER

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This paper deals with the handling of the uncertainty associated with the estimation of the incremental cost-effectiveness ratio through the building of confidence regions, with an application to the high dose chemotherapy in the treatment of breast cancer. In addition, for decision-making to be possible, the confidence region of the ratio must be a directed single confidence sector because of the "mirror decision" problem. However, none of the methods of the literature solve simultaneously both these problems. Our objectives are to critically review the various methods of computation in order to propose an alternative method relevant for decision-makers. Thus, we develop a method we call the truncated Fieller's method which solves the statistical problem as well as the decision-making problem.
An empirical application of these methods on data issued from a randomised controlled clinical trial which correspond to the problematic case in which differences in clinical effectiveness are small is described and Monte-Carlo simulations have been carried out to assess the performances of the various methods.
The methods based on the density of the estimated ratio (such as the bootstrap methods) become unstable or even inapplicable whenever the difference between average effects approaches statistically zero. Unfortunately, in practice, the data often show this pattern. It is therefore more appropriate to use methods based on the bivariate density of the pair of variables: the difference between average costs, the difference between average effects.
The truncated Fieller's method satisfies this condition and provides a directed single sector. Furthermore, after Monte-Carlo simulations, we conclude that the performances of the truncated Fieller's method are almost perfect in a variety of situations and we make some recommendations so that the method be usable in practice and to improve the use of the results coming from cost-effectiveness analysis in the context of cancer.

OP33. COST-EFFECTIVENESS OF SCREENING FOR LUNG CANCER USING AUTOMATED QUANTITATIVE CYTOMETRY

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The cost of lung cancer management in Canada has been estimated at $633 million (2002, CAN$). Patients diagnosed with Stage I show the lowest cost per case ($31,890) while those with Stage IIIa have the highest cost at $39,240 per case. Prognosis is better for patients diagnosed with early stage lung cancer (>80% 5 year relative survival) than those with late stage cancer (<10% 5 year relative survival). In the absence of formal lung cancer screening guidelines sputum cytology and computed tomography (CT) scans are used in clinical practice as diagnostic tools.

Automated Quantitative Cytometry (AQC) consists of a high-resolution quantitative microscopy system that analyzes the concentration and distribution of DNA and chromatin structures within the cell nucleus of sputum cells in order to determine the likelihood of lung cancer presence in the particular patient.

Using a computer-simulated model, a hypothetical cohort consisting of patients aged 45–74, with a smoking history of ⩾20 pack years were screened using AQC as a first step in the screening algorithm. The incremental cost-effectiveness was determined for a one time prevalence screen using AQC compared to CT screening and no screening. Direct costs (2002 CAN$) and quality adjusted life years (QALYs) were used as inputs and outcomes, respectively.

Results to date show that AQC is moderately cost-effective with an incremental cost-effectiveness (compared with no screening) of $17,865/QALY. Using the most favourable input estimates in the model the cost-effectiveness improved to $8,234/QALY. Comparing AQC with CT screening, the cost-effectiveness was $13,354/QALY. Sensitivity analyses showed the most influential parameters to be specificity of the AQC test and prevalence of disease.

We will expand the economic model, using AQC as a screening modality, to analyze the cost-effectiveness when the frequency of lung cancer screening shifts to every two years.

OP34. COSTS AND QUALITY OF LIFE OF PATIENTS WITH NEWLY DIAGNOSED STAGE II/III MULTIPLE MYELOMA UNDERGOING INTENSIFIED CHEMOTHERAPY ALONE OR INTENSIFIED CHEMOTHERAPY FOLLOWED BY MYELO-ABLATIVE TREATMENT WITH AUTOLOGOUS STEM CELL RESCUE: A PROSPECTIVE RANDOMISED PHASE III STUDY

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Objective: To compare costs and quality of life (QoL) of patients with previously untreated multiple myeloma (MM) undergoing intensified chemotherapy or the same treatment followed by myelo-ablative chemotherapy with autologous stem cell.
Methods: The cost and QoL analyses were based on subsamples ($n=100$ and $n=186$, respectively) of 379 patients included in the clinical analysis. On behalf of the cost analysis, medical resource use was mapped by chart review. Average unit costs were calculated based on financial data from participating hospitals. QoL was measured at 9 points of time by the EuroQol-5D and EORTC QLQ-C30 questionnaires.
Results: Costs of the intensified chemotherapy and stem cell collection as applicated to all patients amounted to € 35,525. Subsequently, by randomisation patients received interferon-α-2a maintenance (IFN, 3×10^6 units thrice weekly) treatment (arm 1) or myelo-ablative treatment with autologous stem cell rescue, followed by IFN (arm 2). From the start of the randomised treatment up to three years after randomisation, mean costs of arm 1 were significanly lower (€ 26,458; 95% CI 21,679-31,236) than the costs of patients in arm 2 (€ 43,864; 95% CI 34,244-53,485). During intensified chemotherapy (all patients) global QoL improved and a reduction of several complaints (particularly pain) was shown. During the first year of follow-up, patients in arm 1 had a higher level of physical, role and social functioning and a better QoL as compared to patients who underwent myelo-ablative treatment (arm 2). After myelo-ablative treatment, patients had more complaints of fatigue, pain, loss of appetite, nausea and vomiting, and diminished sexual interest. Event-free and overall survival were similar.
Conclusion: Intensified chemotherapy is regarded standard therapy for younger patients with previously untreated MM. The cost-effectiveness of myeloma therapy is not favoured by a next course of myelo-ablative treatment.

OP35. PHARMACOECONOMIC ANALYSIS OF CAPECITABINE IN COMBINATION WITH DOCETAXEL FOR ADVANCED BREAST CANCER

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Purpose: In a phase III trial in anthracycline-pretreated patients with metastatic breast cancer, the addition of capecitabine to docetaxel resulted in a significantly superior response rate, time to progression and importantly overall survival compared with single-agent docetaxel. The purpose of this pharmacoeconomic study was to assess the cost-effectiveness of capecitabine plus docetaxel compared with docetaxel alone in these patients in terms of quality-adjusted survival and associated health care costs.
Patients and Methods: Patients were randomized to 21-day cycles of oral capecitabine 1250 mg/m^2 twice daily, days 1–14, plus docetaxel 75 mg/m^2 day 1 ($n=255$), or docetaxel 100 mg/m^2 day 1 ($n=256$). Cost-utility analysis was used to compare outcomes and cost-effectiveness of capecitabine/docetaxel combination therapy and docetaxel monotherapy. Medical resource utilization data were prospectively collected in the trial; costs associated with medical care resource use and quality- of-life adjustments were obtained from the published literature. The incremental cost-utility ratio was calculated as the cost per quality-adjusted year of life (QALY) gained.
Results: The addition of capecitabine to docetaxel resulted in an increase in median survival of 3 months compared with docetaxel alone (14.5 versus 11.5 months). Mean quality-adjusted survival was increased by 1.8 months in the capecitabine/docetaxel group. Total medical resource utilization cost per patient was higher by 4.4%: $20,701 for combination therapy and $19,834 for single-agent docetaxel. Mean cost per QALY gained with combination therapy was $5850. Cost savings due to reduced docetaxel and hospital use are the major cost offsets. Sensitivity analyses show that varying the mean hospital cost per day resulted in cost-utility ratios ranging from $9163 (for $500) to as low as $2546 (for $2000).
Conclusion: Capecitabine/docetaxel is a highly cost-effective treatment in anthracycline-pretreated patients with advanced breast cancer, and is substantially more cost-effective than many other oncologic therapies reported in the literature.

OP36. THE IMPACT OF SKELETAL-RELATED EVENTS ON PREFERENCES AND HEALTH-RELATED QUALITY OF LIFE OF PATIENTS WITH METASTATIC PROSTATE CANCER

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Purpose: Skeletal complications, or skeletal-related events (SREs), are often associated with metastatic cancer. SREs include pathologic fractures, spinal cord compression, surgery to bone, radiation treatment, and other changes in therapy. We describe changes in patient-reported outcomes (PROs) following SREs among patients with metastatic prostate cancer.
Methods: Using data from a phase III clinical trial of zoledronic acid versus placebo, we included patients ($N=248$) who had experienced ⩾1 SRE during the study. PROs were measured by the Functional Assessment of Cancer Therapy-General (FACT-G), the Brief Pain Inventory (BPI) intensity and interference with functioning scales, and the EuroQOL. Mixed-effects models were used to estimate changes in PRO scores following each patient's first SRE.
Results: EuroQOL thermometer and utility scores decreased significantly after radiation and pathological fracture. The following significant effects were also observed: (a) Physical Well-Being declined after radiation to bone, pathologic fractures, and other SREs; (b) Functional Well-Being declined after radiation and other SREs, though not after fractures; and (c) Emotional Well-Being declined after radiation and fractures, and slightly declined after other SREs. Patients with a previous SRE experienced little change in Social/Family Well-Being; but patients without a previous SRE experienced an increase in these measures. The FACT-G total score declined significantly after radiation but changed little after fractures and other SREs. Both pain intensity and interference scores increased slightly following a fracture or other SREs, although the increase was not significant. Pain intensity scores decreased significantly after radiation. Significant effects corresponded to standardized effect sizes of 0.19–0.56.
Conclusion: SREs cause decreases in health state preferences from patient and societal perspectives, as well as decreases in physical, functional, and emotional well-being. Given the burden associated with these complications, interventions which reduce the risk of SRE need to be considered for metastatic prostate cancer patients.

PP1. CHEMOTHERAPY COSTS AND TOTAL RESOURCE USE IN TREATING ADVANCED NON-SMALL-CELL LUNG CANCER BY VARIOUS CHEMOTHERAPY REGIMES IN GERMANY

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Background: The cost of chemotherapy drugs for the treatment of non-small-cell lung cancer (NSCLC) varies greatly. This study examines the extent to which various regimes produce differential costing profiles.
Methods: A retrospective economic analysis was applied to two prospective randomised, controlled trials of gemcitabine/cisplatin (GC) and other regimens. Comella *et al*. (2000) compared GC with vinorelbine/cisplatin (VC); Schiller *et al*. (2002) compared GC with paclitaxel/cisplatin (PC), carboplatin/paclitaxel (CP) and docetaxel/cisplatin (DC). Costs were grouped under four main headings: chemotherapy, drug administration, hospitalisations and other medical resources. German health care costs were drawn from the literature and standardised questionnaires.
Results: When costings were applied to the Comella *et al*. study the percentage of the total cost of the GC regime that was consumed by chemotherapy was 44.7%: the corresponding figure for the VC regime was only 30.2%. However, the total cost of the GC regime was only 86.7% of the VC regime (€7061 versus €8143). When costings were applied to the Schiller *et al* study then chemotherapy costs for the GC combination, as a proportion of total costs of the regime, were found to be lower than the other three regimes (49.3% versus 52.4% (PC), 74.1% (CP) and 53.8% (DC)). In addition, the total cost of the GC regime (€8425) was only 76.2% of the total cost of the PC regime (€11052) and 68.7% of the total cost of the CP regime (€12265), the total cost for the DC regime (€8329) was similar to the GC regime.
Conclusion: Different chemotherapy regimes for the treatment of NSCLC produce different magnitudes and proportions of cost across the major resource headings. However, chemotherapy costs alone should not be the only cost element considered in the financial component of treatment decisions.

References: Comella P, Frasci G, Panza N *et al*. Randomized trial comparing cisplatin, gemcitabine, and vinorelbine with either cisplatin and gemcitabine or cisplatin and vinorelbine in advanced non-small-cell lung cancer: interim analysis of a phase III trial of the Southern Italy Cooperative Oncology Group. J Clin Oncol 2000;18:1451-1457. Schiller JH, Harrington D, Belani CP *et al*. Comparison of four chemotherapy regimens for advanced non-small-cell lung cancer. N Engl J Med 2002;346:92-8.

PP2. PRODUCTIVITY AND HEALTH EFFECTS OF RADIOTHERAPY IN BREAST CANCER PATIENTS

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Background: The Washington panel recommends production losses are included as health effects; the implication being the EQ-5D should capture productivity changes. Others argue for production losses to be included in the numerator of the cost-effectiveness ratio.

Methods: We examined the effect of radiotherapy on productivity and health effects using data from START trial, which are investigating alternative radiotherapy fractionation regimens for breast cancer. Data on the EQ-5D and productivity (paid and unpaid) were available up to 24 months. We examined the time it took individuals to return to their usual paid and unpaid productive activities, the effect on productive hours, ability to perform activities and the implications for replacement costs. We also investigated whether the EQ-5D data was sensitive to productivity changes.

Results: Data were collected from 2180 women. Women in paid employment (53%) mainly continued to work throughout treatment or returned by 6 months (78%). About 1/3 worked fewer hours and 70% were less able to perform at work. Lost hours were mainly covered by existing employees (54%) or replaced by new/temporary workers (27%). Nearly all women (>80%) returned to usual unpaid activities (eg housework) by 6 months. The EQ-5D data suggested that, compared to the normal population, women receiving radiotherapy faired poorer in terms of usual activities, pain/discomfort, and anxiety/depression, but this difference decreased over time.

Conclusion: Most women returned to their productive activities soon, if not immediately, after radiotherapy. Productivity loss was mainly in terms of ability to perform usual tasks. The cost of replacement workers is important in the first 6 months after treatment. The EQ-5D appears to be sensitive to the change in ability to perform usual tasks. There may be some double counting if ability to perform productive activities is also included in the numerator of the cost-effectiveness ratio.

PP3. EVALUATION OF EFFECTIVE COST OF ADULTE ACUTE LEUKEMIAS TREATMENT IN ITALY: IMBALANCE IN NATIONAL HEALTH SERVICE REPAYMENT

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In the last years the therapeutic approaches to adult acute leukemias are progressively more intensive and differentiated,in attempt to improve both remission and long term survival rate.
New agents such as unconjugated and radioimmunoconjugated monoclonal antibodies, tyrosine kinase inibithors, have been introduced in therapeutic plan to add further options in overcoming resistant diseases. Furthermore, supportive therapy which include either antinfectious therapy, blood derivates, growth factors as well as parenteral nutrition,plays a basic role in a correct management of disease outcome. As the hope to cure leukemias grows, on the other hand the cost for National Health Service (NHS) increases.
In our country, Italy, NHS has established a prefixed repayment for any disease treated in a public hospital, according to Disease Related Group (DRG) list of rates. Adult Acute Leukemia is refunded 20.331,15 euro on the whole, whether myeloid or lymphoid type. In the present report we assessed standard cost in euro of induction therapy in one case of Acute Myeloid Leukemia (AML) and one of Acute Lymphoid Leukemia (ALL), respectively. The following parameters have been evaluated:

	AML	ALL
• Chemotherapeutic agents	895,30	517,45.
• Antinfectious therapy:.	13611,02	1093,26
• Blood support	3284,62	1257,48
• Parentheral nutrition ..	1034.00	149,70
• Central venous catheter	530,67	0000,00
Total amount in euro	19.355,61	3017,89

Since in this analysis the daily standard cost of patient's stay in the ward. (food, disposable items, medical and nurses team, diagnostic procedures) was not included, it can deduce that NHS repayment is adequate to pay ALL treatment, but unsatisfactory at all in terms of current therapy of AML.
The challenge could be that hematologists are engaged in the periodic analysis of costs of gold standard therapy in adult AL, in the purpose of adjust NHS repayment.

PP4. HOSPITAL BUDGETARY IMPACT OF INNOVATION: THE CASE OF THE COST OF LOCALISED PROSTATE CANCER WITH HIGH INTENSITY FOCALISED ULTRASOUND

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High intensity focused ultrasound (HIFU) treatment of localised prostate cancer has been studied as a new therapy in the university hospital of Caen. The aim of this study was to evaluate the total hospitalisation cost of localised prostate cancer with HIFU and compare it with the mean cost of the French DRG. We assessed the impact of the innovation therapy for the hospital. Patients and Methods:a total of 32 patients were included in the study between April and October 2002. A standard cost was calculated with microcosting method in all the hospital components and a mean cost of the 32 patients only on the following components: medical and nursing care and drugs.
Results: mean of the age of this cohort was 67.2 years (±6.3), mean length of the hospitalisation was 3.87 days (±1.18). The total standard hospitalisation cost was €4 723.35. The standard cost and the mean cost were not different. The mean cost of the DRG 477 and 478 were, respectively, €3 332.18 and €2 326.14. The difference with total standard cost was respectively €1 391.17 and €2 397.21. The hospital shows a deficit between €139 117 and €239 721 per year when one hundred patients undergo HIFU.
Conclusion: This study could help the hospital to plead with the Regional Agency of Hospitalisation for a specific budget for this innovative therapy.

PP5. BOOTSTRAP TESTS FOR NULLITY OF THE DIFFERENCE BETWEEN AVERAGE COSTS

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To compare alternative medical strategies in the cost-effectiveness analysis, we can be interested by testing that the difference between the average cost of each treatment is null. Cost data generally are nonnormally distributed (it can be due to a few very high cost values that may not necessarily be dismissed as outliers for example, but not only). In its first part, this paper revues and discusses common methods of dealing with nonnormal cost distributions found in the literature. Many of these methods are not appropriate. The Mann-Whitney U nonparametric test needs the hypothesis of equality between the variances (it is not the case in general). The t test is too much biased if the sample size is too small, fortunately for the patients, it is often the case for medical data. The tests using the log-transformed data cannot test the nullity of the difference between average costs which is not equivalent, in general, to the hypothesis of nullity of the difference between average log-costs (for instance, if the costs are normally distributed, we need in addition the equality between the variances). The bootstrapped tests we saw in the literature are not well specified under the null hypothesis. In the second part, we specify correctly the bootstrap procedure, we present two nonparametric bootstrap methods, and we discuss parametric bootstrap methods. Monte Carlo experiments using resampling from an economic evaluation conducted alongside a clinical trial are presented.

PP6. A COMPARISON OF FOUR METHODS: FOR ELICITING CONTINGENT VALUATIONS FOR COLORECTAL CANCER SCREENING

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"Willingness to pay" (WTP) is now commonly used as a measure of valuation in health care technology assessment. A variety of formats for eliciting values are available, although the merits of each remain the subject of methodological controversy. This paper compares results obtained from three studies using four different elicitation formats (open-ended, payment scale, closed-ended and iterative bidding). Subjects were drawn from a general population and were all asked to value the same intervention - screening for colorectal cancer. The studies were designed explicitly to facilitate comparison between WTP formats, in terms of the valuations obtained and the reasons offered for such values. It was discovered that, whereas the open-ended and payment scale instruments produced broadly similar valuations, the closed-ended produced significantly higher values and also different justifications for these. It is hypothesised that anchoring and yea-saying effects explain the differences and that the closed-ended format triggers a different response mode in subjects. The iterative bidding format produced considerably higher valuations than did either the open-ended or payment scale formats, whilst the significant differences between agreed valuations obtained using different initial bids pointed to the existence of starting-point bias in the bidding game. The overall findings from the three studies are discussed in relation to those of previous methodological studies, with a view to establishing whether they are consistent both with earlier results and the explanations previously offered.

PP7. Abstract withdrawn.

PP8. THE COST OF CANCER CARE IN SCOTLAND

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A methodology has been developed to estimate the cost of cancer care to the National Health Service (NHS) in Scotland. The total cost of providing the NHS in Scotland was £5635.17 m in financial year 2000/01 but the proportion of this that was used to deliver cancer care is not known Although we have excellent information concerning outcomes for patients that have received care we know little about the cost of the care provided. Recent attempts to improve outcomes for cancer patients in Scotland include the injection of sums of cash, however the efficiency (or cost effectiveness) of the health care system is not known, therefore any improvements in efficiency cannot be reported. If we are to know whether the current system is providing a cost effective service or not, then we must be able to analyse both the costs and the outcomes of the service.

This study describes the calculation of the individual contribution to total costs that each category of care made. Calculations were according to the application of Unit Costs from published sources, where available, to activity figures derived from the interrogation of a number of routine datasets. In the absence of suitable Unit Costs or activity data, estimates were made based on the literature or expert opinion.

In Scotland Cancer accounts for 27% of all deaths, 16% of all inpatient bed days, 24.5% of all day cases and 12.3% of all outpatients.

The results indicated that £421.4m is spent on providing Cancer services for Scotland, which equates to 7.47% of the total health care spend for Scotland.

PP9. INDIRECT COMPARISON OF TREATMENT OPTIONS: THE EXAMPLE OF FIRST AND SECOND LINE TREATMENT OPTIONS IN CHRONIC MYELOID LEUKAEMIA

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Objective: To determine the average cost-effectiveness ratios (CE-ratios) of first line treatment with Interferon (IFN) and second line treatment with imatinib in Chronic Myeloid Leukaemia.

Methods: Since these CE-ratios cannot be determined in a direct comparison we developed a model to perform a general cost-effectiveness analysis. This model was drawn up in DATA-pro and consists of two phases: an induction phase, in which patients are treated with two different doses of IFN or with imatinib, of eight months followed by a chronic treatment phase in which patients are treated according to the outcome of the induction phase. Data on treatment efficacy, transition probabilities and costs are derived from literature and expert opinion. Costs were based on real cost prices and tariffs. Future costs and effects were discounted at a rate of 4%.

Results: Compared to first line IFN, treatment with imatinib second line gives greater quality adjusted life years (QALYs); 4,98 versus 6,67. Average costs of treatment with an average of 5MIU IFN per day are €76969 and with 3MIU IFN €53257. For treatment with 400mg imatinib per day, the total costs are €140765 per patient. Average cost-effectiveness ratios in the 5MIU IFN group are €15445 per QALY and €10687 in the 3MIU IFN group. Using imatinib second line, the average cost-effectiveness ratio is €21082 per QALY.

Conclusion: This simple model enabled us to compare the cost-effectiveness ratios of a first and second line treatment option in CML-patients in chronic phase in the absence of direct comparative data. The structure can be used and adapted easily for other indications, such as diffuse large B-cell lymphoma where a requirement for cost-effectiveness information exists and results of direct comparisons of treatment options are awaited. With the growing requirement of CE-analyses this approach might prove a valuable approach in different phases of the development process.

PP10. PREDICTION OF GASTRIC CANCER RISK USING THE SERUM PEPSINOGEN TEST

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Background: The mortality rate from gastric cancer in Japan is the highest in the world. Preventing premature deaths from gastric cancer has been a top priority of the government. Photofluorography (taking several X-ray pictures of the stomach) was introduced as a screening method around 1960 and has become available nationwide. Recently, the serum pepsinogen is associated with risk of gastric cancer and has been used for gastric cancer screening. The risk of gastric cancer among pepsinogen-positive group has been unknown in long-term follow-up.
Aim: To evaluate the risk of gastric cancer comparing between pepsinogen-positive and-negative groups.
Subjects: The subjects were 5168 office workers of major corporations in Tokyo, who were screened for gastric cancer using serum pepsinogen test for the first time in 1996–97.
Methods: They were followed up for 6 years to observe if onset of gastric cancer appears among them. Based on the follow-up survey, the relative risk of gastric cancer in the pepsinogen-positive group was compared with that of the pepsinogen-negative group using Cox's proportional hazard model with age adjustment.
Results: Of the 5168 individuals who were screened for gastric cancer using the serum pepsinogen test in 1992, 995 subjects tested positive (19.3%) and 4173 subjects tested negative (80.7%). Since 2002, the cumulative numbers of gastric cancers detected in the pepsinogen-positive group were eight cases, while that in the pepsinogen-negative group was four cases. The relative risk of the pepsinogen-positive group was calculated to be 6.0 holds higher risk than that in pepsinogen-negative group (95% confidential interval: 1.80–20.30). In males, the gastric cancer risk for the pepsinogen-positive group was 8.3- hold higher than that for pepsinogen-negative group (95% confidential interval: 2.18–31.9).
Conclusion: The serum pepsinogen test is a useful strategy for identifying individuals with a high risk of gastric cancer.

PP11. THE IMPACT OF CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING ON PATIENTS, HEALTH RESOURCE UTILIZATION, AND COSTS IN GERMAN CANCER CENTERS

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Background: Chemotherapy-induced nausea and vomiting (CINV) remains a major adverse effect of cancer chemotherapy. Aside from its clinical consequences, CINV has considerable economic impact.

Objective: To estimate the direct and indirect cost of CINV in Germany among patients receiving emetogenic chemotherapy.

Methods: This was a prospective, multi-center, cross-sectional, cost-of-illness study conducted in 3 hospitals and in 3 office-based facilities in Germany. 280 patients receiving highly emetogenic therapy were enrolled consecutively. Data were obtained from chart reviews and from self-administered patients' questionnaires. Descriptive statistics of direct medical and nonmedical costs were computed from the perspective of third party payers.

Results: 221 patients completed the diary and were evaluated. 97% patients received a 5HT3 antagonist and 56% received a combination of a 5HT3 antagonist and dexamethasone. 30.3 and 63.3% of patients, respectively, experienced at least one episode of vomiting or nausea after chemotherapy. Only 33.3% of patients reported neither vomiting nor nausea, despite antiemetic prophylaxis. Significantly more patients (60.1%) reported delayed than acute vomiting and/or nausea (37.4%). 19.4% of patients suffered from severe nausea, 5.1% from severe vomiting. 1 patient withdrew from chemotherapy because of CINV. 15.2% of patients consulted a physician due to CINV, 1% required an ambulance transport and extended hospitalization. Out-of-pocket payments were made for OTC complementary and/or alternative medication (2% of patients), taxi or public transportation (6.1%), and extra home help or child care (1%). 2% of patients lost workdays due to CINV. Mean direct costs per patient per treatment cycle to third party payer were €45.20 (all patients counted, with or without CINV) and €66.6 (for patients with CINV).

Conclusion: In this study we demonstrated that there is room for improvement in the prevention of CINV. The costs of CINV treatment documented here may potentially offset some of the costs of more effective CINV therapy in the future.

PP12. TREATMENT COSTS OF BREAST CANCER RECURRENCE AND DEATH

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Background: The objective of the study was to evaluate hospital and outpatient treatment costs of invasive breast cancer in relation to recurrence and death.

Material and Methods: The study population consisted of all primary invasive breast cancers diagnosed in the city of Turku Finland among women aged 40–74 years in 1987–1993. The number of cancers was 556. During a five year follow-up from diagnosis, 98 patients developed recurrence, 59 died of breast cancer, of whom 40 after recurrence and 19 after primarily metastasised breast cancer, and 23 patients died of other causes. Breast cancer recurrence was defined as relapse at any site after the primary treatment. Treatment costs (in Euros) were based on the average costs calculated per year for inpatient hospital days and outpatient visits at the different hospital clinics and a private cancer clinic.

Results: The mean treatment cost per patient was 2.4-fold for breast cancer with recurrence compared to breast cancer costs without recurrence ($17,096; $7,017; $P<0.001$). The mean treatment costs per patient were 1.6-fold for those who died after recurrence compared to those who survived after recurrence (€22,173; €13,794; $P<0.001$). The mean treatment cost per patient was 2.8-fold for those who died of breast cancer compared to those who survived (€20,941; €7,366; $P<0.001$). The majority of costs (63%) for those who died of breast cancer occurred during the last year of life.

Conclusion: Breast cancer recurrence and dying of breast cancer were related to high treatment costs per patient. For those who died of breast cancer the majority of costs accumulated during the last year of life.

PP13. ATTITUDES OF ONCOLOGISTS TOWARD THE ECONOMIC EVALUATION FOR THE CANCER TREATMENTS

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Purpose: For improvement of the quality of medical care, respect of the patient's self-decision, effective utilization of the limited medical resources, the necessity of the economic evaluation for the cancer treatments heightens. The problems and prospects are clarified when an oncologist and a researcher do the economic evaluation of the cancer treatments.
Method: The questionnaire survey was carried out for 7436 specialists of oncology in Japan, and grasp of the problems on cancer economics and the solution were carried out.
Results: The number of effective answers is 1808 (response rates: 24.3%). An average age is 46.7 ± 5.9 years old. Ratios of male to female are 95:5. The degree of importance of clinical aspects to evaluate the cancer treatments, QOL viewpoints, economic aspects are 58, 27 and 15%, respectively, under the present condition. Moreover, ideals are 45, 35 and 20%, respectively, and it is understood that the importance of the economic aspects is fairly well recognized among oncologists. It is cost comparison and cost-effectiveness analysis of the different therapies that there were many answers as an economic evaluation, which relates most to the cancer treatments and research. RCT, management analysis, QALY, meta-analysis follow this. The things thought a difficulty most in the economic evaluation of the cancer treatments are the cooperation system of various institutions concerned and understanding of the patient and family. Secondly, they are methods of investigation, cost analysis, outcome setting, analytical models and hypothesis. It is proven that guidelines and database on cancer economics are strongly being asked.
Conclusion: Standardization of diagnosis and therapy, the database of treatment outcome and cost, and the guideline of the economic analysis should be stressed as the integral fundamentals of economic evaluation of the cancer treatments.
(Granted by the Ministry of Health, Welfare and Labor)

PP14. DIFFERENCES IN COST EFFECTIVENESS OF FOUR APPROVED SEROTONIN RECEPTOR ANTAGONISTS AS ANTIEMETIC PROPHYLAXIS IN GERMANY

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Serotonin receptor antagonists (SA) are standard of care as antiemetic prophylaxis (AP) and multiple well conducted comparative trials led to I A level of evidence concerning the equal effectiveness of the different agents when used in optimal dose. Method: We evaluated the costs of i.v. SA: Ondansetron (O), Granisetron (G), Tropisetron (T) and Dolasetron(D) as inpatient (IP) and outpatient (OP) therapy in Germany (only approx. cost for IP because of individual pricing). We defined the optimal dose (OD) of each of the four drugs as the lowest dose where there is no evidence at all from pubished studies that an increase contribute to more efficacy. We did a survey of routine prescription (IP /OP) of SA (drug and dose) and correlated the results with the total turnover of SA (IP/OP) in Germany (comercially available data).
Results: Most study data are available for O (OD = 32 mg)and G (OD = 1 mg). OD-data and equal efficacy data for T (OD = 5 mg) and D (OD = 200 mg) are less comprehensive. Costs of OD are very diverse ranging from 3 € for one OD of G as IP prophylaxis (if a 3 mg vial is divided for 3 pts) to 157 € for one OD of O as OP prophylaxis. O is given frequently in a dose below the OD. The survey revealed a dominance of O (55/57%) consistent with the turnover data. G is the most costeffective drug when given in OD (IP and OP) but is used rarely (10/5% in our survey, $<1\%$ of total turnover in OP setting) and prescribed routinely in a dose above the OD. Conclusion: The prescribtion of SA in Germany (choice of drug and used dose) is not consitent with rational decissions including consideration of dose comparison studies and costeffectiveness data.

PP15. SHIFTS OF REMUNERATION FOR ONCOLOGICAL WARDS AFTER IMPLEMENTATION OF THE G-DRG- SYSTEM IN GERMANY

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After legal implementation G-DRG system for hospital remuneration (''Fallpauschalengesetz''), German hospitals face a radical change of the modalities of reimbursement: In lieu of a remuneration depending on the duration of hospitalisation (RDH) a lump sum per case will be paid. The amount paid for a specific patient will depend on his principal diagnosis (condition that established after study is being chiefly responsible for occasioning the patient's episode of care in hospital).

For 2003 health authorities assessed German DRG (G-DRG) case values by imitating Australian Refined DRGs (AR-DRGs) and by integrating into these billing data of 116 German hospitals (82% with less then 800 beds). As this preliminary calculation included only few cancer centres and no university hospitals the case weight for hemato-oncological DRGs is most absurdly low.

This study compares real and fictive reimbursements obtained from RDH, AR-DRG and G-DRG systems by analysing 4058 accounting records collected consecutively in a university hospital for haematology and oncology with 119 beds in 2002 (annual turnover 20 Mil EURO). 46.5% of patients were allocated to a haematological DRG, 30.2% to an oncological DRG, respectively. 6.4% can be retrieved from a follow-up DRG leaving 16.9% patients partitioning in other specialities (gastro-enterology, cardiology, infectiology). 18 patients were ineligible. Payments of each system were compared. For the haematological patients overall remuneration is 5.48 Mil EURO lower with G-DRG (minus 43%) in comparison to RDH, and would result in a deficit of 1.42 Mil EURO (minus 34%) for oncological patients, with an even higher relative imbalance for the subgroups with high co-morbidity and complicity levels.

If introduced in this unmodified version, G-DRG will lead to blatant imbalances in the remuneration of patients with malignancies in Germany compared to the present status, mainly due to insufficient cost calculations. Thus it is reasonable and necessary to provide sufficient resources for physicians to implement cost calculations for adaptation of the G-DRG system and for correction of the imminent undersupply for these patients.

PP16. HEALTHCARE UTILIZATION AND EXPENDITURES ASSOCIATED WITH SEVEN TUMORS BY THE TREATMENT COURSE

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Objectives: To evaluate healthcare resource use and expenditures associated with treatment of seven tumors of interest (TOI) and to compare by initial, secondary and palliative treatment courses.

Methods: A retrospective case-control study was conducted using MarketScan™ claims databases of >3 million US employees, dependents, and early retirees. Cases were newly diagnosed with TOI in 1999–2000. Control groups were members without cancer and matched 3:1 with each case group (97.5% match) on gender, age, health coverage, region, and follow-up period. Monthly total expenditures were adjusted for demographics, Charlson Comorbidity Index, follow-up period, and hospital mortality using ordinary least squares regression.

Results: The study consisted of 12,709 cases and 38,127 controls. Cases included 43% prostate, 22% colorectal, 16% lung, 5% brain, 3% ovarian and 3% pancreatic cancer, and 8% Non-Hodgkin's lymphoma patients. Mean length of each treatment course was 6.3 months for initial, 8.9 months for secondary, and 6.4 months for palliative care. Mean monthly number of hospitalizations, length of stay, emergency room visits, office visits, outpatient prescription drugs, laboratory and radiology procedures, and associated expenditures of cases were significantly higher compared to controls ($P<0.05$). Office visits were the most frequently used healthcare service, however major driver of total expenditures was inpatient care of $7266, $509 and $4115 for initial, secondary and palliative care, respectively, and $90 for controls. Mean monthly total expenditures were $8125, $1074 and $6,140 for initial, secondary and palliative care, respectively, and $329 for controls.

Conclusion: Healthcare expenditures were at least 4 times higher for cancer patients than for controls during any treatment phase. Among cancer patients, initial treatment was associated with the highest healthcare expenditures and inpatient expenditures accounted for over 50% of total expenditures. A need exists for prevention and new interventions that would improve treatment outcomes and reduce healthcare utilization associated with the seven tumors.

PP17. QUALITY OF COLONOSCOPY PREPARATION: ASSOCIATED FACTORS AND CONSEQUENCES

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Objectives: Improving efficiency of a diagnosis exam is a well known way to decrease its cost effectiveness ratio. For colonoscopy, quality of the preparation and access to the caecum are two essential factors of the efficiency of the exam. We have tried to analyze the explicative factors of a bad preparation and to approach the rate of re-examinations.

Methods: This retrospective study on the conditions of realization of the colonoscopy (n = 2122) in public and private establishments of PACA region (south of France) allowed to determine what the operators observe themselves in their daily practice. A logistic regression model was tested to determine the explicative factors of a bad preparation. Furthermore, the number of exams repeated was estimated.

Results: 14.7% (311/2122) of the preparations were considered as insufficient by the operators; discovery of pathology (polyp or cancer) was significantly influenced (P = 0.012) by the quality of preparation. Age, realization in ambulatory, coming for screening, high risk of cancer, and realization of the procedure in an establishment having an important daily practice are explanatory factors of a bad preparation. The re-examination rate was 2.33%. It represented an additional colonoscopy cost of 1.5 M€ in PACA region.

Conclusion: Considering both the risk related to an exam with a bad preparation and not redone and that added in case of re-examination, a campaign of sensibilisation among gastroenterologists, nurses as well as patients, could allow to decrease significantly the rate of bad preparations, consequently improving the efficiency of an useful, often indispensable, but risky exam.

PP18. CREATION OF AN INTRANET DATABASE FOR THE TREATMENT OF METASTATIC BREAST CANCER WITH HERCEPTIN: INITIAL RESULTS:

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Introduction: The MA for Herceptin® was granted for weekly use in monotherapy or in association with Taxol. In order to facilitate the spread of this new treatment, the Hospitals Directorate and the Health Care Organisation has taken on the costs of acquisition of the treatment in return for a medico-economic trial, the results of which should allow the budget resources needed to be released in order to generalise the use of this chemotherapy to be estimated.
Methods: Clinical data from the HER.ME.S trial (HERceptin/Metastatic/Breast) are collated on line by 12 anti-cancer centres. The online case report form allows the inclusion and non-inclusion criteria to be validated, and for the treatment arm selected: herceptin alone or every 21 days, herceptin + weekly paclitaxel or every 21 days, responses, adverse events, cardiac assessments, hospitalisations until treatment is stopped to be entered. The economic evaluation of patient management and follow up was performed using external unit costs
Results: An interim analysis of the database has been performed. Of the 81 pre-inclusion dossiers, 44 patients received chemotherapy with herceptin. 21 patients in whom the treatment was stopped were studied in more detail. The mean duration of treatment was 15 weeks [3–36]. The total cost of the cohort of 21 patients treated from the perspective of the institutions based on DRG* was 630,400 euros. The cost of the 304 administrations of chemotherapy was 400,550 euros (76%). Tumour extension, cardiac and laboratory assessments represented 43,150 euros (8%) and organisational costs made up 86,700 euros (16%).
Conclusion: The objective of the Ministry is to establish the bases of year on year financing of treatments with herceptin which allows the treatments to be used in widespread practice when use is generalised. The role of economists is to help doctors find the finances necessary to them to care for the patients.

Keywords: Metastatic breast cancer; Herceptin; Online clinical trial

*Diagnostic Reference Groups

PP19. COST EFFECTIVENESS ANALYSIS OF MALIGNANT HEMOPATHIES DIAGNOSTIC: A ASSESSMENT BASED ON THE COST FUNCTION

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This work presents a cost effectiveness study about the diagnosis of malignant hemopathies. Two alternative strategies of molecular cytogenetics analyses for detection of chromosomal abnormalities will be compared (FISH vs RT-PCR for each pathologies). The diagnostic effectiveness criteria of the study is the rate of detection of true positive anomalies, which are relevant, according to the current state of knowlegde.

The cost assessment is performed in about ten cytogenetic and molecular centres in France for different hemopathies. It is based on physical quantities consumed (in consumables, equipment and personnel) and valorised in monetary terms using public prices for the year 2002. Economic analysis is based on the French hospital point of view. A cost function will be estimated for each strategy. The determination of this function will allow a comparison between cost-effectiveness analysis based on average cost (AC) and marginal cost (MC).

We expected twofold repercussions of our study: firstly to provide economic arguments in the decision making process of malignant hemopathies diagnostic strategies; secondly to show the consistency and the accuracy of the application of rigorous microeconomic theory to Heath Care.

The analysis is in process and the results will be available in summer.

This work is supported by a grant from the french ''Ministère de l'Emploi & de la Solidarité'' for the: ''Innovative and Expensive Diagnostic and Therapeutic Tools Programme.''

Keywords: Cost-effectiveness; Marginal cost; Average cost; Diagnosis; Malignant hemopathies; Microeconomic theory.

PP20. PARTICIPATION IN CERVICAL CANCER SCREENING: A DECISION-MAKING FRAMEWORK

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Aim and Methods: Ninety percent of women in England and Wales participate in cervical cancer screening, yet little is understood about the decision heuristics involved. To illuminate motivations for attendance, semi-structured interviews with 20 women, aged between 19 and 65 years, were conducted, recorded and transcribed in full. The data were analysed using an iterative thematic approach, resting on a qualitative deductive framework, which employed four potential lines of reasoning: economic rationalism (risk management and regret), the authority of health professionals (agency and incentive structures), membership of ''the surveillance society'' and the politics of gender.

Results: Motivation for screening appears to be driven by the individual's perceived responsibility to protect her own health. Attendance is rationalised by regard to ''what might happen in the case of non-attendance for screening''. It is a fear of cancer in general, as opposed to cervical disease more specifically, that drives such risk-reducing behaviour. The health care system is deemed authoritative and acts as the signal for ''good health behaviour'' on several levels (ranging from the NHS as a whole, down to the local GP or nurse). There was no perception of pressure from health professionals to attend for screening. Participation in the screening process provides reassurance in itself, through regular monitoring and confirmation of prior beliefs that disease is absent. However, once women find themselves outside the usual and expected cycle of regular negative results, belief in the system falters. A lack of information and uncertainty drives feelings of anxiety and worry. Patriarchal control of female sexuality, a common feminist argument as to why women participate in screening, was not supported by these data.

Conclusion: Women's screening decisions can be explained in terms of economic rationalism, especially the concept of regret, albeit bounded and informed by authoritative agents.

PP21. INFORMATION AND PARTICIPATION IN CERVICAL CANCER SCREENING: DOES IT MAKE A DIFFERENCE ?

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Aim and Methods: The UK NHS has placed considerable emphasis on educating women and on ensuring that their participation in cervical screening is based on informed consent. The aim of this study was to ascertain women's knowledge about cervical cancer and the screening programme, and to identify women's perceptions of the level and need for information. We employed both quantitative and qualitative methods, involving a large-scale questionnaire survey, focus groups and semi-structured interviews.
Results: Respondents to the questionnaire survey generally over-estimated the prevalence of cervical cancer, often by the order of 500%. Whilst accepting that screening could not be ''perfect'', departures from perfection were attributed to human error rather than to limitations of the test itself. There was considerable uncertainty about the meaning of an abnormal test result, and ''normal'' results were often considered to represent an ''all clear'' in terms of cervical disease. Multiple sexual partners and smoking were correctly identified by many as major risks for the disease. However, the impact of genetic factors was given unwarranted prominence and the risks associated with papillomaviruses was largely overlooked. Despite such ''misinformed'' participation in screening, most women did not feel the need for further information to be provided at the time of the test. Women who had received abnormal results were more likely to demand further information, but the provision of accurate information about the test and disease did not change women's perceptions about their participation.
Conclusion: The consent to participate in cervical screening is not informed, in the sense of individual's possessing full and accurate information. Rather, the existence of an official and organised screening programme is interpreted as an indication that the disease must be important and that screening must be beneficial. This is not perceived as a shortcoming of the programme until abnormal results are received.

PP22. TIME FOR LUNG CANCER SCREENING: SPIRAL-CT COSTS COVERAGE BY REDISTRIBUTION OF FUNDS USUALLY INVESTED ON SCREENING CHEST RADIOGRAPHY

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Prospective studies of lung cancer screening have not demonstrated that screening with Chest Radiography (SC-Rx) saves lives. Moreover, due to the low prevalence of pulmonary tuberculosis in developed countries, mass radiographic screening has ceased to be justifiable and it is considered an avoidable cost. Inversely, low dose spiral-CT scan is an expensive but cost-effective promising method for lung cancer screening. Considering that SC-Rx practice is a frequent phenomenon among the community, the purpose of the study was to evaluate if lung cancer screening spiral CT (LCS-CT) costs may be covered in whole or in part by the redistribution of resources that are currently lost in SC-Rx. Material and methods: Data on 2530 asymptomatic individuals (aged 50–80) were analyzed for patients' gender, age (50–59, 60–69, 70–80), SC-Rx practice and SC-Rx frequency within one year. Since SC-Rx cost is 16.4 €, the number and the cost of SC-Rx per 100.000 individual was estimated for each analyzed group. Conversely, considering that the cost of a single LCS-CT is 71.4 €, and its application is justified among a high risk population, its economic impact was estimated both among the overall high risk subpopulation (HRsP) of each group and on the proportion of HRsP that actually undergoes SC-Rx (HRsP-Rx) as early diagnostic procedure (<10% of the HRsP).

Results:

		SC-Rx cost €	LCS-CT cost € HRsP	LCS-CT cost €
female	50-59	214 360	202 221	20 222
	60-69	185 520	161 538	16 153
	70-80	219 100	28 900	2 890
male	50-59	184 730	1 936 820	193 682
	60-69	164 000	1 487 499	148 749
	70-80	224 300	976 540	97 654

Conclusion: The obtained data suggests that among women at high risk smoking practice lung cancer screening spiral CT costs may be covered by the redistribution of resources that are currently wasted for SC-Rx among the female population. In male gender, SC-Rx to LCS-CT funds redistribution may cover in whole the LCS-CT cost only for the fraction of heavy smokers that are actually undergoing screening with chest radiography, but for the all population of heavy smokers LCS-CT costs may be covered only in part. Since resource redistribution among these screening activities may reduce avoidable cost by enhancing screening quality and lung cancer control, we believe that it' s time for LCS-CT.

PP23. BAYESIAN MODELLING OF UNCERTAINTY IN PERSON TRADE-OFF (PTO) AND DISCRETE CHOICE (DC) EXPERIMENTS

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Stated preference experimental techniques based on the estimation of the individual's utility function from responses to hypothetical questions are being increasingly used in the health economics literature.

In the case of unfamiliarity or preference imprecision (particularly significant in cancer screening programs where the number of possible set-ups is high) the survey provides one additional contribution: it allows the individual to improve his/her level of information about the illness and additionally to be getting to learn about his/her valuation. The data we are using in this paper comes from an in person questionnaire survey conducted in the Canary Islands to 1000 women randomly selected from the regional health service identity cards. We study the valuation of the benefits arising from the implementation of a cervical cancer screening program with the inclusion of the Human Papilloma Virus (HPV) test using the PTO and DCE techniques. We develop an integrated Bayesian approach, which allows the researcher to internalise the uncertainty of the individual valuation. We use the results from PTO experiment as prior information in the Bayesian model, which is combined with data from DCE questions.

The joint PTO-DCE and the DCE models are estimated separately and compared. The two alternative monetary approaches are simulated using a Monte Carlo study, showing that modelling the behavioural process implicit in the survey improves the performance of the results. From the results we can conclude that combining two different SP experiments in the same survey and using the information coming from one of them as prior for the second method further reduces the individual's imprecision associated with preference formation. The Bayesian model improves the accuracy of the predictions and reduces the dispersion of welfare estimators for all the attributes considered. Thus there is need to study the usefulness of alternative preliminary questions in DCE which could contribute to develop human preferences for health status more accurately.

PP24. AMBULATORY VERSUS INPATIENT CONTINUOUS INFUSION CHEMOTHERAPY: AN ECONOMIC EVALUATION

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Background: The economic impact of a pilot ambulatory continuous infusion chemotherapy (CIC) program as compared to standard inpatient management for cancer patients at an academic tertiary care centre was uncertain and had not been evaluated.
Objective: To compare the cost-effectiveness of two strategies of administering CIC.
Methods: Of the initial thirteen patients treated on the program, the six that were administered either vincristine/doxorubicin/dexamethasone for multiple myeloma or etoposide/vincristine/doxorubicin/cyclophosphamide/prednisone for lymphoma were selected. Six previously treated inpatients matched by age, sex and treatment regimen and who would have met the established criteria for the ambulatory program were randomly selected as controls. Detailed information regarding resource utilization during periods of treatment was extracted from patient records. Since inpatients and outpatients received the same chemotherapy, the treatment efficacy, complication rate, medical care for illnesses other than their cancer, and thus resource use between the times of treatment were assumed to be the same for the two approaches. Unit cost data were obtained utilizing a hospital-specific costing model, provincial billing data for physician services, interviews with hospital staff, and hospital data for salaried professionals, medication costs, and pharmacy services. Costs for implementing the program and depreciation of capital equipment were also taken into account. The overall costs associated with each approach were compared, and sensitivity analyses were performed for those variables felt to be most uncertain.
Results: The mean and median costs per cycle of treatment were $960(Canadian) and $755 for ambulatory patients as compared to $2104 and $1669 for inpatients. The results did not change substantially on sensitivity analyses including exclusion of medication costs or of the first cycle of treatment.
Conclusion: Despite the initial costs of introducing the program, CIC is associated with lower costs if administered in the ambulatory as compared to the inpatient setting.

PP25. ADVANCED PROSTATE CANCER AND HEALTH ECONOMICS: COST RELATED STRATEGIES FOR DECISION MAKING

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Based on epidemiological data of incidence, estimated prevalence of PCA in Germany, costs of androgen deprivation of different regimen were determined in a study model.
We have analyzed data published by the tumor registry Munich which indicate that from 3838 patients with carcinomas of the prostate, 38% has been treated exclusively with hormone suppression therapy, 14% of patients had undergone a combined radiation therapy and hormone suppression therapy and 9% underwent combined surgical therapy and hormone suppression therapy. The mean survival time of patients treated with medical therapy alone, for patients treated with combined radiation therapy and medical therapy were 60, 24, and 120 months, respectively. Costs for orchiectomy were estimated with $ 1072,- costs for LH-RH therapy were estimated with $ 224/month.
We estimated an incidence of 17,700 (per year) and a prevalence of 115,000 patients with advanced prostate cancer for Germany. Provided all patients would receive LH-RH treatment a total cost of $ 308 Million/year would arise. Provided, all patients underwent surgery a total cost of $ 19 million/year would arise. If all patients received LH-RH agonists, the treatment would amount to $ 16,944 per patient, independently of the prognostic group. If all patients underwent surgery $ 1072 per patient would arise.
Limited health care budgets mandate critical determination and evaluation of costs to provide a component for the complex decision making process. However, they must be complimented by validated data of quality of life, which can than be a basis for new guidelines of decision making.

PP26. COST-EFFECTIVENESS ANALYSIS OF IRINOTECAN PLUS FLUORO-URACIL/FOLINIC ACID COMPARED WITH FLUOROURACIL/FOLINIC ACID ALONE AS FIRST-LINE TREATMENT FOR ADVANCED COLORECTAL CANCER

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Background: An economic evaluation was carried out from the perspective of the Spanish National Health System to test that the utilization of irinotecan in combination with fluorouracil and folinic acid is cost-effective compared with fluorouracil and folinic acid alone in the first-line treatment of advanced colorectal cancer.
Patients and Methods: Efficacy data from the study by Douillard *et al.* (Lancet 1998; 325: 1407-12) were used. To obtain information about the utilization of resources for the two groups of patients, data collected for 41 Spanish patients were used and Spanish costs from a variety of sources were assigned. The incremental cost-effectiveness was calculated comparing the costs and survival of the alternatives.
Results: Douillards trial showed an improved survival with the irinotecan group of 2.80 months (0.233 y) compared with the control group. Cumulative drug costs and other resource consumption per patient (e.g. average number of cycles per treatment), were higher in the irinotecan group. Patients in the control group required a greater amount of additional chemotherapy after the trial. The average cost per patient was 22,280 Euros and 14,016 Euros in the irinotecan and control groups respectively. The incremental cost per life-year gained in the baseline case was 35,416 Euros.
Conclusion: The combination of irinotecan with fluorouracil and folinic acid can be considered cost-effective in the first-line treatment of advanced colorectal cancer in the Spanish setting.

PP27. CONNECTION BETWEEN THE STADIUM OF BREAST CANCER AND THE HEALTH INSURANCE COST OF TREATMENT ON THREE YEARS FOLLOW-UP

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Purpose: The purpose of the study is to calculate of the health insurance cost of treatment of breast cancer according to the different TNM stadium of cancer.

Data and Methods: The patients were taken from the county of Tolna from the year 1999 and includes all women who were diagnosed breast cancer either by mammography screening or by complaints. Although the organized breast cancer screening started in Hungary in 2001, in county Tolna there was a pilot project since 1999 sponsored by the World Bank. Altogether 89 patients were identified as breast cancer cases. The cost data derived from the financial database of the National Health Insurance Fund of Hungary and includes the cost of out- and inpatient care and drugs. The follow-up period was 3 y, from 1999 to 2001.

Results: The distribution of patients was: 0. stadium 10,1%, I. stadium 37.1%, II. stadium 22.5%, III. stadium 25.8%, IV. stadium 4.5%. The average health insurance cost of the patients with different stadium was as follows: 0. stadium 601.132,- Ft (Hungarian Forint) or 2.405,- euro, I. stadium 615.223,- Ft (2.461 euro), II. stadium 1 065 271,- Ft (4.261,- euro), III. stadium 1 394 908,- Ft (5.580,- euro), IV. stadium 1 553 834,- Ft (6.215,- euro).

Conclusion: According to the higher TNM stadium, the cost of breast cancer treatment increases. It is well known that the organized breast screening programmes provide an earlier diagnosis form cancer. For the Health Insurance Fund it is very important to support and subsidy organized breast cancer screening for saving lives and saving costs.

PP28. PREFERENCE (UTILITY) ASSESSMENT IN PATIENTS WITH GYNECOLOGIC MALIGNANCIES: THE M.D. ANDERSON EXPERIENCE

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Several challenges exist when conducting formal evaluation of patient preferences (PP) in cancer patients. These studies are extremely resource intensive and some patients are unable to participate due to the complexity of instruments, language barriers, hospitalization or treatment effects. Despite these barriers, we have been able to conduct our studies to include a wide variety of patients from a vast array of backgrounds. This abstract describes our 5-year experience with PP studies in a Department of Gynecologic Oncology at a tertiary cancer center. To date, we have used the visual analog scale (VAS), time trade-off (TTO) and standard gamble (SG) to longitudinally assess preferences for outcomes (permanent health states) of prophylactic oophorectomy/mastectomy for 3 groups of women: (1) women with strong family histories of breast and/or ovarian cancer; (2) patients diagnosed with breast and/or ovarian cancer; and (3) healthy female controls. In addition, the VAS, TTO, and SG are currently being used to compare preferences for side-effects (temporary health states) of first-, second- and third-line chemotherapies in 4 groups: (1) heavily pre-chemo-treated women with advanced ovarian cancer; (2) their family caregivers; (3)clinicians; and (4) healthy controls. Ongoing studies include longitudinal assessments (before/during/after treatment) of treatment side-effects using VAS and TTO in patients with advanced/recurrent ovarian cancer enrolled on phase II and III trials of high-dose chemotherapy with stem cell transplant versus conventional therapy. Studies with cervix patients involve VAS and SG for (1) permanent and temporary outcomes of chemoradiation in African American, Caucasian and Hispanic women; and (2) outcomes of radical hysterectomy in women with early stage cervix cancer. Finally, the VAS and SG are currently being used for patients with endometrial carcinoma enrolled on a phase II chemoradiation trial. Our experience demonstrates that formal assessment of PP is possible and can be objectively measured across disease sites in both preventative and therapeutic settings.

PP29. SCREENING URINALYSES: THE COSTS OF A "MYTHOS"

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Urinalysis is frequently employed by primary care physicians as a screening tool for early diagnosis of urinary tract malignancies and renal diseases. However cost-effectiveness studies failed to document any useful role for screening urinalysis (ScUr) among asymptomatic individuals and it is therefore considered an avoidable cost. Considering both that ScUr is a frequent phenomenon especially in the elderly, and that a single urinalysis cost in Greece is 7.10 Euro, the purpose of the study was to reveal the economic impact of screening urinalysis overpractice among the community.

Material and methods: Data on 3000 asymptomatic individuals (aged 40–80) stored in SESy-P (Screening Evaluation System Data Base) were analyzed for patients' gender, age (40–49, 50–59, 60–69, 70–80), ScUr practice and ScUr frequency within one year. Both the overall numbers of ScUr and the percentage of ScUr per individual were calculated for each sex/age subgroup; the related cost was subsequently expressed for 100 000 individuals. Urinalysis among diabetics was not considered a ScUr event since it has a secondary prevention value. Results: number of ScUr (N) and related costs (€) estimate for 100 000 subjects.

Female	N	€	Male	N	€
40–49	47 000	333700 00	40–49	2000	14200 00
50–59	70 000	497000 00	50–59	50 000	355000 00
60–69	71 000	504100 00	60–69	58 000	411800 00
70–80	95 000	674500 00	70–80	78 000	497000 00

Conclusion: Despite the low cost of a singular ScUr, the frequent phenomenon of ScUr practice in the elderly makes it a major burden for the health economy. Continual medical education of medical personnel is required to reduce this worthless cost.

PP30. CLINICAL PATHWAYS MODELS OF COLORECTAL CANCER

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Objective: Although colorectal cancer is among the most common cancers, limited data are available on the economic consequences of treating the disease. The objective of this study was to use SEER-Medicare data to develop clinical pathways models of colorectal cancer for use in pharmacoeconomic analysis.

Methods: We utilized linked data from the U.S. National Cancer Institute's SEER cancer registry and administrative files of the Medicare program to generate incidence-based cost-of-illness estimates for colorectal cancer. We then used techniques of probability tree analysis to develop clinical pathways models based on the SEER-Medicare data. Study subjects were patients with colorectal cancer diagnosed between 1992 and 1996 who did not report ever having any other cancer. Branching in the models was intended to reflect the typical order of treatments: local surgery, primary and secondary chemo- and radiotherapy, and metastatectomy. Separate pathways models were developed for colon and rectal cancer cases by tumor stage at diagnosis. Treatment patterns and costs were modeled for two years from the time of diagnosis.

Results: We identified 20 692 colon cancer and 4146 rectal cancer patients. Two-year average costs for colon cancer were $13 014, $18 774, $23 822, and $22 241 for stages I–IV, respectively; corresponding mean costs for rectal cancer were $13 435, $22 112, $26 609, and $22 138. The lower costs for stage IV patients reflect their higher rate of mortality. Local tumor resection without either adjuvant or secondary treatment was the most common treatment pathway, particularly for stage I and II tumors. Patients requiring secondary treatment within two years of diagnosis incurred 31–88% higher costs than those receiving primary treatment only.

Conclusion: Clinical pathways models provide "all-in-one" depictions of the most common patterns of care for colon and rectal cancer by stage and will be valuable for future cost-effectiveness modeling of antineoplastic agents that might effect changes in these patterns of care.

PP31. ASSESSING COST IMPACT AND ECONOMIC BENEFITS: THE USE OF A DECISION MODEL TO SELECT CANCER PATIENTS WITH CHEMOTHERAPY RELATED ANAEMIA FOR TREATMENT WITH EPOETIN ALFA (AN ERYTHROPOIETIN)

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Anaemia (associated with severe fatigue and poor QoL) affects ~60% of chemotherapy patients. Standard treatment in UK is blood transfusions, which face increasing supply constraints and rising cost. Epoetin alfa also treats anaemia and avoids blood use.A decision model was developed to identify patients who might avoid the most blood transfusions if treated with epoetin alfa. The model employed regression analysis using a 2719-patient UK observational dataset to identify the factors that most predict blood transfusion. The most significant factors (tumour type, Hb level, chemotherapy cycles remaining, Hb level drop > 1.5g/dl) were used as selection criteria to define hypothetical patient cohorts for epoetin alfa treatment. Clincial trial results were combined with the observational dataset to identify cost impact and economic/patients benefits of introducing drug treatment for 4 main tumours (breast, lung, ovarian, testicular). Applying relatively selective criteria (e.g. treat patients meeting criteria of Hb < 10 g/dl, 2 cycles of chemotherapy since onset of anaemia, at least 3 remaining), and using ovarian cancer as an example, these criteria identified 104/856 patients in the dataset (12%) as eligible for epoetin alfa, at a net cost of £230 000. Looking at blood use in all 856 patients, the predicted proportion of blood saved is 20%. Cost per unit of blood saved is £630, and the cost/QALY is £26 000. More inclusive criteria (< 10.5 g/dl, 3 cycles gone/at least 2 remaining) would result in selection of 306/856 patients (36%) at higher net cost (£720 000) but with 51% of total blood use avoided. The study shows it is possible to select anaemic patients according to clinical criteria to limit the cost impact of introducing drug treatment. If budgets are increased, marginal analysis of the economic impact of extending the programme to more patients, through application of less strict selection criteria, can be assessed.

PP32. COMPLIANCE AND EFFICIENCY OF CARE BEFORE AND AFTER THE IMPLEMENTATION OF A GUIDELINE FOR DIAGNOSIS, TREATMENT, AND FOLLOW-UP OF LARYNGEAL CARCINOMAS

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Objective: To evaluate the efficiency of care and compliance before and after implementation of the Dutch guideline for diagnosis, treatment, and follow-up of laryngeal carcinomas.

Methods. This study was conducted in 5 academic centers for head and neck oncology. Compliance was measured by interviewing head and neck surgeons and radiotherapists, and by patient data obtained from chart review. Of all patients, hospital costs during diagnosis, treatment, and follow-up (< 1 year) were calculated on the basis of data from the hospital information systems.

Results: Data of 459 patients (treated before guideline implementation (GI)) and 363 patients (after GI) were included. Patient characteristics were comparable amongst both groups. The guideline was implemented in all hospitals. A proper compliance with the majority of the recommendations appeared, both before and after GI. Nevertheless, several changes in accordance with the recommendations occurred after GI: improved extent of re-evaluation of biopsies from referring hospitals, less variety in radiotherapy schemes, increased application of accelerated radiotherapy, more organ preserving therapies, increased rate of clinical trial participation, and abolition of the routine X-thorax during follow-up. GI appeared to have no influence on the costs of the diagnosis phase, treatment phase, or follow-up phase. The efficiency of care largely remained unchanged following GI. At best, the efficiency improved slightly during diagnosis and treatment.

Conclusion: A proper compliance with the guideline recommendations was shown, but the number of changes following GI was limited. Therefore, the process and efficiency of care appeared to be at a proper level, already before GI. Nevertheless, small improvements were observed and the study identified some additional points for efficiency improvements.

PP33. CLINICAL AND ECONOMIC ASPECTS OF THE TREATMENT OF AGED NHL PATIENTS

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One of the most formidable epidemiology problems of the century appears to be the tumorous diseases of the senior population. In Hungary, the ageing index (over 65/under 14 population multiplied by 100) was 54.4 in 1970 and soared to 85.5 by 2000. The sixth most frequent tumour is non-Hodgkin lymphoma (NHL) and one fourth of the new patients is older than 70. This disease responds well to chemo- and radiotherapy, is potentially curable, and the over −70 patients treated have additional life expectancy of several years, so that 5-year survival following treatment is a rather realistic objective. Late diagnosis, advanced state of the disease, accompanying ailments and the small number of protocols available for the aged may present a problem. In addition to the biological age and the general physical condition, the psychological and social status of the patient also has to be taken into consideration when selecting the appropriate, often individual treatment. Besides analysing the clinical data of 183 (86 male and 97 female) over-70 NHL patients treated between 1978 and 2000 at the "A" Chemotherapy Department of the National Institute of Oncology, the authors carry out "quality of life" (QoL) studies and present the results. They also focussed on the financing problems and other economic relevant aspects of this group of diseases. The authors wish to call the attention of the decision-makers of the health sector to the socio-economic importance of the elderly, untreated or undertreated NHL patients, the often very poor therapeutic results and the scarce availability of intensive treatment.

PP34. COST COMPARISON OF ISOLATED LIMB PERFUSION WITH TUMOR NECROSIS FACTOR AND MELPHALAN, AND AMPUTATION FOR NON-RESECTABLE SOFT TISSUE SARCOMA AND MELANOMA OF THE EXTREMITIES

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Objectives: To compare costs of isolated limb perfusion (ILP) with Tumor Necrosis Factor (TNF) and chemotherapy in soft tissue sarcomas and melanomas with bulky in-transit metastases with costs of amputation.
Patients and Methods: Nine patients out of a series of 109 ILP were randomly selected four patients with amputation secondary to trauma or vascular disease were used as a control group.
Cost sampling was limited to the hospital perspective. Data were extracted from patient charts. Personnel costs were computed from observed wages multiplied by the real time involved in patient care. Laboratory, imaging tests and drug acquisition costs were computed as prices. Finally, meals and linen were computed as standard costs per day.
Results: Length of stay for ILP was 7.5–13.8 times shorter than for amputation. ILP used 6 times less resources in hospital ward care, but 6 times more in operating theatre, and 30 to 36 times less in rehabilitation therapy. Nearly half of the cost of ILP was linked with TNF alpha acquisition cost. Due to different lengths of stay, daily costs for ILP ranged between 3 and 4 times those of amputation. Equivalence would be observed if length of stay for amputation could be reduced to 63.4 days.
Conclusion: ILP with TNF alpha and chemotherapy was less expensive than amputation for non-resectable soft tissues sarcomas and melanomas of extremities. Access to a potentially effective treatment should not be denied to patients only because of high drug cost.

PP35. COST COMPARISON BETWEEN MICRONEUROSURGICAL AND RADIOSURGICAL MANAGEMENT OF ACOUSTIC NEUROMA

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Objective: To determine the cost incurred for the management of acoustic neuroma smaller than 3 centimeters in diameter treated either by microneurosurgery or radiosurgery. Based on this comparative cost analysis, to determine the impact of such medico-economic study on health care management.

Patients and Methods: The variable costs observed in the management of thirty patients treated for acoustic neuroma, either by microneurosurgery ($n=15$) or radiosurgery ($n=15$) were identified based on year 2000 costs in a hospital perspective. They included all items for the pre-treatment and treatment periods. These costs were further computed in a society perspective, including indirect costs as well as costs incurred over one year follow-up.

Results: When variable or total costs were considered, microsurgery was five times more expensive than radiosurgery (Euros $10\,080 \pm 1\,514$ versus $2\,030 \pm 153$ in a hospital perspective, and Euros $26\,608 \pm 4\,544$ versus $5\,471 \pm 851$ in a society perspective). The main items responsible for the difference were hospital length of stay and post-treatment convalescence period.

Conclusion: In the management of acoustic neuroma smaller than 3 centimeters in diameter, microneurosurgical management is five times more expensive than radiosurgery both in a hospital and a society perspectives. Assuming a similar efficacy of both therapeutic modalities, radiosurgery is highly justifiable from a medico-economic standpoint. Further medico-economic studies should help justify the creation or the upgrading of radiosurgery units in dedicated centers.

PP36. COST IDENTIFICATION OF TEMOZOLOMIDE TREATMENT FOR RECURRENT GLIOMAS FOLLOWED UNTIL PATIENT'S DEATH

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Objective: To assess the marginal cost of Temozolomide (TMZ) for treating recurrent gliomas, along with the costs of treatment until patients' (pts) death.
Patients and Methods: The 49 pts treated for first recurrence after standard radiation therapy (32/17 M/F, mean age 49 y, range 23–79), received TMZ (200 mg/m^2/dx5d every 28d) until second recurrence or cure. For second recurrence, continuous TMZ (75 mg/m^2/d×6 weeks) or other treatment was administered. Follow-up consisted of medical visits, blood tests, and MRI every other month to detect relapse.
Cost assessment singled out TMZ cycles, and follow-up phases. Personnel costs were computed as wages×time; drugs, imaging and laboratory tests as prices; and hospitalisations at fixed rates by type of hospital.
Results: During first recurrence, pts received a median of 5 TMZ cycles, at a median cost of Euros 2 177/cycle. Eleven required hospitalization in acute care and 10 in palliative care. Observation time was 4.6 months.
Eight patients showed no second recurrence after 4.9 months at a cost of Euros 163/month. Fifteen pts did not receive further treatment, and died after 1.3 months at a cost of Euros 1 551/month. Thirteen pts received continuous TMZ over 3.8 months at a cost of Euros 2 236/month. Seven pts received continuous TMZ and other drugs over 6.6 months at a cost of Euros 3 547/month. Finally, 6 pts received other drugs only, over 2.6 month at a cost of Euros 2 060/month. Eighteen pts needed hospitalization in acute care, 26 in palliative care.
Overall, pts treated with TMZ during both recurrences had a prolonged survival as compared with pts whose 2nd recurrence was either not treated or treated with other drugs (11.5 versus 6.0 months). Cost-effectiveness ranged between Euros 13 176 and 36 971/year gained.
Conclusion: TMZ treatment in recurrent gliomas is well tolerated, efficient, but expensive, due to high drug acquisition costs.