Hemoccult II test, one-view mammography and the Pap-smear test. The paper discusses the characteristics of each of these tests along with the natural history of the cancer diseases in a comparative analysis. The aim is to give the reader an intuitive understanding of the advantages and disadvantages of these screening technologies. Evidence from recent trials is used when available.

Methods: For each of the screening modes a cost effectiveness analysis is presented. The analyses are based on simulated costs and effects using evidence from existing screening data and generalising these by way of mathematical modelling. In this paper focus is not on the detailed characteristics of the model, but rather on the results of each cost effectiveness analysis. In each evaluation the costs and effects of a series of mutually exclusive screening programmes were simulated for various target groups and screening intervals. Within each set of mutually exclusive programme setups, programmes were identified which at each level of cost maximises life-years gained. Each efficiency curve constitutes this subset of dominating programmes.

Results: The relative positioning and the shape of each of the efficiency curves are discussed in light of the respective disease- and test characteristics. Efficient colorectal cancer screening programmes are characterised by being less effective but more cost effective relative to mammography and cervical cancer screening. The efficiency curve is relatively linear showing very little tendency to curve upwards with incremental costs ranging from $2625 to $6570. The incremental cost range for efficient mammography screening programmes as well as cervical cancer programmes is much wider with maximum incremental costs of $79,870 and $77,290, respectively.

Discussion: For colorectal cancer decreasing the screening interval has no significant effect on cost per additional life-year because the number of cancers detected is increased considerably when the screening programme is intensified. The reason being that the Hemoccult II test is inexpensive, has a low sensitivity and the latency period of the disease is short. The steep slope of the cervical cancer screening curve is explained by the long sojourn time and the high sensitivity of the screening test which renders it unnecessary to screen frequently. Incremental costs rise markedly if the screening interval is reduced beyond 4 years. For mammae cancer the slope is likewise steep which is also explained by the high sensitivity of mammography, the length of the average sojourn time and a relatively low specificity. However, since the latency period for this type of cancer is considerably shorter than for cervical cancer, it is reasonably cost effective to screen as often as every 2 years. This paper suggests that in a Danish setting an optimal programme constellation would be to introduce annual colorectal cancer screening of the 50-74 year olds along with biennial mammography targeted at the 50-69 year olds and cervical cancer screening every 4 years for the 25-59 year olds. This would entail an overall maximum cost per life-year of $9060.

Gyrd-Hansen D, Centre for Health and Social Policy, Winsløwparken 17,1, 5000 Odense, Denmark

PP32. The impact of cancer on premature death in Japan

Hamashima C[1], Hasegawa T[2]
[1]Keio University, School of Medicine, Dept. of Health Policy and Management, Tokyo, Japan; [2]National Institute of Health Services Management, Tokyo, Japan

Background: The primary cause of death in Japan is by malignant neoplasm, of which 20% is due to gastric cancer. In Japan, cancer accounts for 38% of total premature death among people in the 0-64 age category. The objective of preventing premature death by cancer was a feature of the 1983 Health Care Law for the Elderly. Since the introduction of Health Care Law for the Elderly, screening for cancer has become readily available throughout Japan. Moreover, this law cites the screening of five different types of cancer : gastric cancer, endometrial cancer, lung cancer, colorectal cancer and breast cancer.

Methods: 1) Calculation of potential years of life loss (PYLL) PYLL is calculated by subtracting the age of death from a defined length of life end point. In the present study, the length of life end point was assumed to be 65 years of age. By using the Ministry of Health and Welfare's Vital Statistics, I calculated the PYLL between 1950 and 1993. In order to compare the PYLL between populations of varying size and age structure over the said period, age-adjustment based on the 1993 Japanese population was undertaken.

2) PYLL and medical expenditures
Only direct medical costs were included in the analysis. National Medical Expenditures, taken from government statistics, were assumed to constitute the direct costs. I compared the PYLL with medical expenditures between 1977 and 1993 for the following categories: malignant neoplasm; cardiovascular disease; total disease.

Results: The PYLL attributable to cancer, cardiovascular disease and total disease has been decreasing over time. Since 1972, the PYLL due to malignant neoplasm has exceeded that caused by cardiovascular disease. Moreover, although gastric cancer induced PYLL has been falling, lung cancer-related PYLL has been increasing.

However, the overall reduction in PYLL has coincided with a rapid increase in medical expenditure for the 0-64 age category. Nevertheless, between 1977 and 1993, for the malignant neoplasm and cardiovascular disease categories, the PYLL has decreased in excess of the increase in medical expenditures.

Discussion: A reduction in premature death by cancer is the ultimate goal in cancer control. Japan's rapidly aging population has compounded the problems surrounding premature death. That is, the percentage of the total population that are in a working age group is declining, and therefore the prevention of premature death is an objective that is related to maintaining the productive power of the total population.

In an attempt at measuring the impact of cancer-related premature death, I compared the change in the cancer induced PYLL during the 1950 to 1993 period. Although death by cancer increased in all aged groups, cancer-related premature death decreased. Rising medical expenditures may have contributed to the decrease in the PYLL caused by cancer.

Hamashima C, Keio University, School of Medicine, Dept. of Health Policy and Management 35 Shinano-machi Shinjyuku-ku, Tokyo, Japan

PP33. The benefit of stabilization under chemotherapy in metastatic colorectal cancer patients: A French prospective study

Henry-Launois B[1], Aussage P[1], Becouarn Y[2], de Monts MC[3]
[1]ARCOS, Issy les Moulineaux, France; [2]Institut Bergonié, Bordeaux, France; [3]Laboratoires Rhône-Poulenc-Rorer, Montrouge, France

Background: The clinical benefit of chemotherapy is usually evaluated in terms of major reduction of tumor volume. In metastatic colorectal cancer, however, response rates to second line chemotherapy are usually modest, whereas stabilization is obtained in about half of the patients. To assess whether stabilization brings about palliative benefits notwithstanding possible deleterious toxicity effects, we compared Quality of Life (QoL) and use of hospital resources in a French prospective survey on patients initiating a second-line palliative chemotherapy for metastatic colorectal cancer.

Methods: 80 patients were enrolled in 21 public and private sites between September 1995 and April 1996, and followed up for 4 months. Tumor assessment and symptomatic status were reported at each cycle, allowing dynamic patient categorization from Initial State into Response (R), STable Disease (STD), Progressive Disease (PD) and Terminal state (T). A QoL questionnaire derived from the Health Utility Index (HUI) was self-completed at baseline, week 8 and week 16 and at treatment drop-out. This index includes 6 QoL dimensions –Mobility, Self-Care, Fatigue, Emotion, Perception of the future, Cognition–, and 3 symptoms –Pain, Nausea/Vomiting, Hair Loss–. Hospital stays were recoded into the French Diagnosis-Related Groups (DRG) classification.

Results: Most used regimens were De Gramont, and protracted low dose 5FU, oxaliplatin associations and Irinotecan as single agent. 9 patients responded to treatment, with R lasting more than 4 weeks; 32 patients were stabilized for at least 4 weeks and categorized as STD until progression or death. Mobility, Self-Care and Pain mean scores were significantly better (p < 0.05) for STD than for PD; mean Pain scores (6-point scale) decrease from 2.5 ((1,4) at Initial State to 1.6 ((0.6) for R and 2.00 ((1.1) for STD, increasing to 2.8 ((1.2) under PD, and culminating at 4.50 ((0.7) at T.

When considering mean QoL changes versus baseline, STD is most beneficial for Mobility, Self-Care and Emotion dimensions (p < 0.05). Under stabilization, fewer patients experience aggravated Pain (27% versus 41% for PD) and Fatigue (17% versus 46%). The incidence of hospitalization and mean number of days in hospital were calculated in terms of number of patients or days per month spent in a given state. All hospitalizations for complications were considered, including toxicity, cancer and other causes. Monthly overall incidence of hospitalization while in STD (0.06) was hardly superior to that of R (0.04) and much lower than in PD (0.25); only two hospital stays due to cancer complications occurred in stabilized patients, whereas this was the prevailing cause for hospitalizing under disease progression (2/3 versus 1/3 for toxicities). Time spent in hospital is cut down by 5 during the stabilization period, as compared to progressive patients (0.40 versus 2.0 days/month).

Discussion: STable Disease (STD) is by all measures better than Progressive Disease (PD). By many measures, it is closer to Response (R) than to PD. Disease stabilization induces QoL benefits in most domains, and particularly regarding Physical Functioning and Pain, as well as a decrease in hospital stays.

Henry-Launois B, ARCOS, 31 rue Ernest Renan, 92130 Issy les Moulineaux, France

PP34. Economic analysis of adjuvant Interferon-ALFA 2B (IFN) in high risk melanoma using projections from ECOG (E) 1684

Hillner BE, Kirkwood JM, Atkins MB, Johnson ER, Smith TJ
Massey Cancer Center, Richmond, VA, Pittsburgh Cancer Institute, New England Medical Center, Boston, Schering-Plough, Inc., Kenilworth, NJ, USA

Purpose: IFN in E1684 prolonged relapse free and overall survival in high-risk resected melanoma. However, the costs and toxicities of IFN are barriers to its widespread use. This study was undertaken to analyze the projected costs and long-term benefits of IFN by combining prospectively collected data on IFN actual dosage, time of recurrence and survival with secondary data on long-term melanoma recurrence risks to project the cost-effectiveness of adjuvant IFN.

Patients and Methods: Two hypothetical cohorts of 50 yr old melanoma patients whose mean IFN dosage and clinical results were directly taken from E1684. Melanoma recurrence risks beyond five years were derived from international databases. Melanoma recurrence care costs and quality of life adjustments, when considered, were based on a consensus of experts. Endpoints were incremental costs, life-years gained, and cost-per life year ($/yr) gained with and without quality of life adjustments.

Results: The model's calculated five-year RFS for IFN was 36.8% compared to 37% in E1684 and an overall survival of 43.0% compared to 46% in E1684. The IFN cohort was projected to increase undiscounted survival of 0.81 years at 7 yrs. The lifetime projections were:

	IFN	NO RX	Δ/Benefit
Average survival, yrs.	8.96	6.77	2.19
Average discounted survival, yrs.	6.74	5.15	1.60
Quality adjusted survival, yrs.	6.11	4.87	1.25
Costs associated with IFN, $	28,636	0	28,636
Total lifetime costs of care, $	111,627	92,408	19,219
Cost per year of life gained ($/yr)			12,031
Cost per QALY			15,380

When recurrence costs were excluded the incremental $/yr increased only to $15,380 to $37,040. If the quality of life associated with IFN was worse than recurrence, the cost-utility ratios changed minimally.

Conclusion: The cost and toxicity of IFN must be balanced against its projected benefits in high-risk melanoma. The derived cost-effectiveness and cost-utility ratios for IFN were more favorable than most commonly accepted health care interventions.

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Hillner BE, Virginia Commonwealth University, VCV Campus, Division of General Internal Medicine, PO BOX 980170, Richmond, VA 23298-0170, USA

PP35. Use of economic models in an evolving drug evaluation strategy: An example in treatment of metastatic breast cancer

Hutton J, Brown R
MEDTAP International Inc, London UK & Bethesda, USA

Background: As part of the planned economic evaluation strategy for a new treatment for advanced metastatic breast cancer a decision analytic model was developed to compare two new taxoids and mitomycin C-vinblastine treatment regimens. To provide economic information on the product at the time of launch, when phase III trial data were unavailable, the model was used to carry out a cost utility analysis for the UK synthesising available data from published sources, early trials and physician opinion. (Hutton et al 1996)

Methods: Since the initial analysis further information has been collected, for example, utilities for the health states in the model from a wider sample of respondents and more specific cost data. More importantly the results of phase III studies for the two taxoid drugs are now being reported providing better estimates of response rates and time to progression, which have an important influence on the results of economic comparisons of treatments. The decision model has been revised and will be used to provide updated cost-utility results for the UK and the US.

Results: The cost utility results using the latest data will be compared with those of the earlier analysis.

Discussion: The intention of the work is two-fold - to provide more accurate estimates for the cost-utility comparison; and to test the usefulness of the modelling approach as part of an evolving evaluation strategy using the best available data at each stage.

Reference: Hutton et al. A New Decision Model for Cost-Utility Comparisons of Chemotherapy in Recurrent Metastatic Breast Cancer. PharmacoEconomics 1996; 9 Suppl.2: 8-22.

Hutton J, MEDTAP International Inc., 27 Gilbert Street, London W1Y 1RL, UK

PP36. Economic effect of multiple fraction per day with acceleration (MF) in extended radiotherapy of patients with Hodgkin's disease (HD)

Ilyin NV, L.I. Koritova LI
Central Research Institute, St. Petersburg, Russia

Background, Methods: We have performed prospectively randomized trials initiated in January 1985 testing new schedule of extended (mantle and Y-inverted fields) radiotherapy - MF with acceleration versus conventional fractionation (CF) for clinical stages I-III HD. All 229 primary patients (on the whole stage III - 163 patients: 71.2%) ageing from 15 to 54 had histologically proven HD. Radiation therapy was delivered with 15 MeV linear accelerator utilizing a total dose 40 - 44 GY regardless of scheme of fractionation. The patients were randomly assigned fractionation's schedules (113 MF, 116 CF). 2 - 3 cycles chemotherapy MOPP were used as a rule before radiotherapy at all II B - III B patients.

Results: The considerable decrease of relapse (12.2% MF-group versus 22% CF-group), acute radiation pneumonitis (for 20%), period of radiotherapy (for 12.4 days in average) were established in patients with MF-schedule as compared with CF-schedule.

Discussion: New schedule of radiotherapy is feasible, faster, well-bearable, more effective and economic method of treatment of patients with HD.

Ilyin NV, Institute of Radiology, Dept. of Radiotherapy, Leningradskaya str. 70/4 Pesockry 2, St. Petersburg 189646, Russia