Lung cancer in Agder counties in Southern Norway

-results from a three year unselected inclusion of patients with newly diagnosed lung cancer

by

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Scientific environment

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2. Abstract

2.1. Aims

The aims of this study on an unselected sample of patients with lung cancer in Southern Norway (the Agder counties) were to describe the various delays in the diagnostic process, a detailed smoking history, explore possible explanations for the high incidence of lung cancer in the Agder counties, and to give the main characteristics of the disease, including health related quality of life (HRQOL), mood disorders and mastery and interactions between these, to enquire upon patient satisfaction with treatment, and to describe the development of HRQOL and mood disorders from diagnosis to the end of first treatment cycle.

2.2. Methods

Unselected patients with newly diagnosed lung cancer, were prospectively included in this questionnaire-based study between June 14th, 2002 and June 13th, 2005 after written informed consent. Questionnaires regarding HRQOL (EORTC QLQ-C30 and LC13), mood disorders (HAD) and, mastery (SoC) were answered and details about smoking habits, symptoms and physician visits at referral and diagnosis were given. The development of EORTC and HAD scores and a specially made patient-satisfaction questionnaire after first treatment cycle were collected.

2.3. Results

Among 479 patients, 42% women, half of the patients were referred to a specialist in pulmonology within 3 weeks (median) of first seeing their doctor with symptoms of possible malignant pulmonary disease. 71% of patients were seen by a pulmonologist within 1 week of received referral, 52% were diagnosed and informed of their disease within 2 weeks of having received the referral letter, and 68% within 3 weeks. 62% started treatment within 1 month of first contact with pulmonologist.

95% had a history of smoking. 88% of ever-smokers reported having smoked primarily hand-rolled cigarettes. Smokers of primarily hand-rolled cigarettes had smoked fewer cigarettes daily (15 versus 20) and less pack-years of tobacco (34 vs 42), but generally also had an earlier smoking debut, than smokers of primarily fabricated cigarettes. Smoking hand-rolled

cigarettes was more frequent than expected, and revealed an OR of 13 for developing lung cancer compared to fabricated cigarettes.

Regarding HRQOL, fatigue and sore mouth were more pronounced in small cell lung cancer (SCLC) than in non-small cell lung cancer (NSCLC). There were no other differences in EORTC scores between histological groups. Patients in poor performance status (PS) reported worse functions and more symptoms, especially fatigue, dyspnoea, sleep disorders and appetite loss, than patients in PS 0-2. Every fourth patient had a HAD-score compatible with anxiety and/or depression, 17% with manifest anxiety and14% with depression. Mean SoC score was 58.3, i.e. 32% of patients scored ≤55, compatible with low mastery. Patients with mood disorders according to HAD reported considerably worse EORTC function scores. Reduced mastery/coping ability according to SoC was only weakly associated with anxiety and depression. HRQOL scores were poorer than reference values from selected EORTC chemotherapy and radiotherapy studies in lung cancer.

After first treatment sequence patients reported worsening of nine HRQOL parameters. Only haemoptysis was improved. Patients in good PS receiving active treatment, reported worsening of physical and role functions after treatment, compared to stable functions in patients doing more poorly at baseline.

Patients receiving surgery reported more dyspnoea and pain, and worse role and physical function, than the chemo- or radiation therapy group. Patients with NSCLC receiving radiation as primary treatment modality experienced more fatigue than patients receiving chemotherapy.

Patients with mood disorders reported less anxiety and depression after first treatment.

Those who were treated actively were definitely positive to repeat the same treatment sequence again (55 %), compared to only 15% among the patients receiving best supportive care.

2.4. Conclusion

This study revealed several potentials for improving the diagnostic process and shortening delays. The results were in alignment with Swedish and British recommendations in 52 to 71% of cases.

As nine out of ten ever smokers developing lung cancer in Agder reported having smoked primarily hand-rolled cigarettes, several results in our study may support the impression that the common use of hand-rolled cigarettes contributes to the high prevalence of lung cancer in the region, but official statistics on smoking patterns, brands and sales are scarce, leaving no possibilities for sound evaluation.

In this unselected sample of patients with lung cancer, HRQOL was reported worse than in reference values from other studies of more selected groups, documenting a higher burden of illness than previously shown. Mood disorders were common and associated with reduced functions and increased symptoms compared to those without anxiety or depression.

The changes in HRQOL after first treatment modality are mostly correlated with disease progression and side-effects. Patients with mood disorders seem to be a group of patients needing more information and closer follow-up to reduce side-effects of treatment in future.

We also find a need for developing easier tools for the measurement of HRQOL in unselected patient populations.

3. List of abbreviations

- CAPPA Cancer Pulm På Agder (*Lung Cancer in Agder*)
- NSCLC Non-small cell lung cancer
- SCLC Small-cell lung cancer
- SSK Sørlandet Sykehus Kristiansand
- SSA Sørlandet Sykehus Arendal
- SfK Senter for Kreftbehandling (Centre for Treatment of Cancer), SSK
- QOL Quality of Life
- HRQOL Health Related Quality of Life
- EORTC European Organization for Research and Treatment of Cancer
- QLQ-C30 Quality of Life Questionnaire Core 30
- QLQ LC13 Quality of Life Questionnaire Lung Cancer 13
- HAD Hospital Anxiety and Depression scale
- SoC Sense of Coherence questionnaire
- χ^2-test Chi square test
- WHO World Health Organization
- ECOG Eastern Cooperative Oncology Group
- PS Performance Status
- BTS British Thoracic Society
- SLCG Swedish Lung Cancer Group
- SD Standard deviation
- IQR Interquartile range (25.th and 75.th percentiles)
- GP General Practitioner
- PET-CT positron emission tomography- Computer tomography
- EBUS endoscopic bronchial ultrasound biopsy
- FNAC fine needle aspiration cytology
- HRC hand rolled cigarettes
- FC fabricated cigarettes
- COPD chronic obstructive pulmonary disease

4. List of publications

1. Rolke HB, Bakke PS, Gallefoss F. Delays in the diagnostic pathways for primary pulmonary carcinoma in Southern Norway. Respiratory Medicine 2007;101(6):1251-7.

2. Rolke HB, Bakke PS, Gallefoss F. Health related quality of life, mood disorders and coping abilities in an unselected sample of patients with primary lung cancer. Respiratory Medicine 2008;102:1460-7.

3. Rolke HB, Bakke PS, Gallefoss F. Relationships between hand-rolled cigarettes and primary lung cancer: A Norwegian experience. The Clinical Respiratory Journal 2009; 3:152-60.

4. Rolke HB, Bakke PS, Gallefoss F. Changes in HRQoL and mood disorders a13nd patient satisfaction after first treatment modality in an unselected population with primary lung cancer in Southern Norway; -submitted.

5. Introduction

5.1. Lung cancer

5.1.1. Definition and incidence

Lung cancer is the common term for bronchial carcinoma, including small-cell lung cancer (SCLC) and non-small-cell lung cancer (NSCLC) with histological subtypes(1;2) and is the most frequent cancer type world wide today, genders seen together, accounting for approximately 1.5 million new cases in 2007, or 12% of total cancer diagnoses(3).

The smoking of tobacco products is closely linked to the incidence of lung cancer(4) and for the same reason the incidence is now increasing rapidly among women world wide, as experienced in North America and Scandinavia the last 50 years(5;6).

The incidence of lung cancer in Norway is still increasing, and mortality due to lung cancer is increasing sharply for women, while stabilizing for men. Lung cancer is the most important cause of cancer related deaths in Norway today, both genders seen together(6).

The Agder counties have, for partly unknown reasons, a higher incidence of lung cancer than the national average (figure 1).

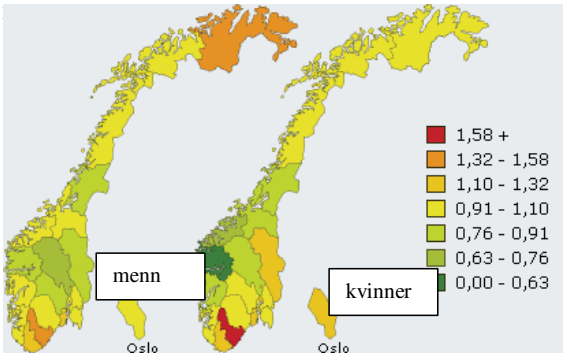


Figure 1. Relative risk of cancer in the lower airways in counties.
(From the Norwegian Cancer Registry, 2002)

Women in Eastern Agder accounted for an almost 200% increase in lung cancer incidence from 1985 to 1995(7) and by 2007, women in Western Agder had the highest age-adjusted incidence-rates in Norway, 31.4, compared to country-mean of 23.0(6) . The reason for this is not understood.

Each year about 170 new cases of lung cancer are diagnosed in Agder. The incidence is highest among both genders in those townships holding large numbers of smokers (smoking has traditionally been more common in urban areas compared to rural(8;9), and in Kristiansand in particular(7)). Kristiansand has a high incidence of 45-52 new lung cancers per 100 000 inhabitants per year(10). Agder holds several industrial agencies with previously high nickel and asbestos exposures, but traditionally employed few women and has formerly been evaluated not to explain the high incidence among females(7).

5.1.2. Treatment

5-year survival in lung cancer is 10-13%, and has been more or less the same the last 40 years(2). However, the population has changed in this period, with an increased proportion of elderly, -in it self an important prognostic factor for long time survival. Besides this, the recent survival figures may hide a small reduction in post-operative mortality, which has been somewhat reduced due to improved post-operative care. Further, improved pre-operative staging has raised the adequacy of the treatment options recommended(2;11).

Surgery is the main treatment that can heal lung cancer. 30% of patients are considered operable at the time of diagnosis in the western world today(12). In Norway this number has been lower. The Norwegian Cancer Registry showed that only 17% of patients with lung cancer were treated surgically in Norway 1991-95(13). Even among patients with localized disease only ¼ of the patients were operated. The reason why so few patients were sent to surgery is poorly documented.

After the opening of Centre for Treatment of Cancer (SfK) at Sørlandet Sykehus Kristiansand (SSK) in 2002, the pulmonary department of SSK had local access to all common treatments for lung cancer, including radiation and surgery.

Thus, we wished to broaden our competence on the area, and also to get a better overview of our results in the treatment of lung cancer. Surprisingly enough, no Norwegian hospitals had, as the study was initiated, a full overview of their results in the treatments of lung cancer.

5.1.3. Side effects of disease and treatment

As more patients are offered palliative, non-curative treatment for lung cancer today than 20 years ago, possible side-effects of treatment can be more frequently encountered now than previously. Patients and their relatives seem to react very differently to side-effects, some regretting that they agreed to receive treatment. To the clinician, it seems important to understand why some patients develop and/or experience more side effects than others, in order to improve the guidance of therapy and information. Patients suffering from lung cancer are shown to have more symptoms and distress compared to other cancer patients (14-17). Symptoms are associated with reduced quality of life (QOL) (18).

5.1.4. Diagnostics and delays

Awaiting information about the serious diagnosis of lung cancer is a strenuous situation for the patient and relatives. The delay from first contact with health workers and hospital to information and treatment should be as short as possible. The Norwegian Society of Thoracic Surgery has recently defined the acceptable delay from referral from diagnosing hospital/department to date of surgery as within 2 months (Steinar Solberg, The Norwegian National Hospital; personal communication, February 2008). Even though such delays may be medically and technically justifiable, each day of waiting seems unacceptable and associated with anxiety and concern for the patient. Thus, cancer patients should be admitted, examined and treated as rapidly as possible.

Wishing to evaluate whether lung cancer is diagnosed and treated within acceptable limits, there are no specific national guidelines for the diagnostic process. Thus, mapping out the local delays and comparing our results to international guidelines became an important part of the study. Comparable time limits considered were guidelines from the British Thoracic Society(19) and the Swedish Lung Cancer Group(20;21).

5.2. Tobacco smoking and other risk factors

Doll and Hill proved the association between smoking and lung cancer in 1950(22;23) and established the dose-response relationship, further enhanced by an early smoking debut(24;25). Today we know that more than 85% of lung cancers are caused by tobacco smoking(26;27). More than one third of the world's population was stipulated to be smoking

in 2000, and new data show that the amount is still increasing(28), especially in densely populated regions such as China and India(27;29). Women seem to be two to three times more at risk to develop lung cancer when smoking the same amount of tobacco as men (30;31). Since the mean age for smoking debut today is lower for both genders than in previous decades, and mostly so for women(32;33), both the percentage associated with smoking and the crude incidence of lung cancer may increase in the near future(34). Hand-rolled cigarettes (HRC), so-called pack-tobacco, may increase this risk by a factor of two compared to factory-made filter cigarettes (FC) (4;35).

Norway is different from the rest of the Western world, since one third of the smoking population is using hand-rolled cigarettes(4). In a recent survey from 2003, 44 and 28 percent of smoking Norwegian men and women, respectively, reported using HRC only(36). HRC have until recently been far less expensive than factory-made cigarettes in Norway, and by 2006 one third of all tobacco sold was pack-tobacco (personal communication; Rita Lindbak, Dept. of Health). By comparison, pack-tobacco sold two and a half times more than FC in Norway in 1973. Sales statistics for other western countries concerning pack-tobacco are roughly non-existent, as the consumption has decreased distinctly since the 1950s(4).

Many studies on tobacco related diseases report whether the patient was smoking or not, but detailed smoking habits and history are scarce. Other reports on populations of lung cancer do not mention smoking at all(37). Alexandersen found that the majority (not further described) of lung cancer patients treated in Bodø reported smoking pack tobacco(38).

Tobacco smoking is the most important risk factor for developing lung cancer, but occupational exposure to nickel and asbestos might contribute to the high incidence of lung cancer in Agder, though hardly for women(7). The coastal population has a long history of sailors, often exposed to asbestos during work in the engine room. Parallel to this they had easy access to inexpensive tobacco abroad.

Little is known concerning domestic exposure to radon. Studies have shown conflicting results(39-42). Radon emittance is local, and associated with geology and building structure. Some of the highest radon concentrations in Norway have been found in Telemark county,

neighbouring on Aust-Agder, while very few local measurements have been performed in Agder(43).

As tobacco smoking is considered the main reason behind most cases of lung cancer, but few details on tobacco use in this patient group are public, we considered mapping out the details of consumption a primary objective.

6. Aims of the study

Our intention with this study was, in an unselected sample of patients with newly diagnosed lung cancer in the Agder counties

- To describe the delays in the diagnostic process of lung cancer, and whether these are within acceptable time limits
- To give the main characteristics of the disease, including
  - Health related quality of life (HRQOL)
  - Mood disorders and
  - Mastery and
  - Interactions between these
- To enquire upon patient satisfaction with treatment
- To describe a detailed smoking history and explore possible explanations for the high incidence of lung cancer in the Agder counties
- To describe the development of HRQOL and mood disorders from diagnosis to the end of first treatment cycle

Since no other Norwegian hospitals could describe detailed results of treatment offered to an unselected group of patients with primary lung cancer, this material was considered important for future comparisons between centres. Further, the evaluation of HRQOL, mood disorders, mastery and patient satisfaction in such an unselected sample was not reported before the study was started.

7. Design and methods

7.1. Study title

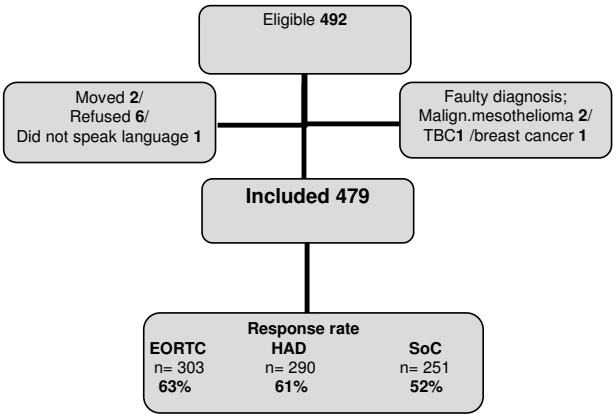
CAPPA is abbreviation for CAncer Pulmonis På Agder (i.e. lung cancer in the Agder counties), used as a working title for the study.

7.2. Study design

A prospective, continuous, questionnaire-based study on all patients >18 years hospitalised or treated in an out-patient clinic in the hospitals in Eastern (Sørlandet Hospital Arendal) – and Western (Sørlandet Hospital Kristiansand) Agder with a newly diagnosed lung cancer between June 14, 2002 and June 13, 2005.

The patients received oral and written information and were requested to participate in the project. Inclusion was voluntary, with the possibility of withdrawing during the study for any reason, without this influencing further treatment at the hospital. Written consent was collected before inclusion. 479 patients were enrolled; the inclusion rate was 97% (figure 2).

Figure 2 Inclusion and response rate to questionnaires at baseline in an unselected population of patients with primary lung cancer in Southern Norway



Additionally to answering questionnaires, the participants gave allowance to the collection of data, such as histological subtype and dates of contact and diagnosis, from the hospital records.

In cases of missing answers, patients were contacted by telephone or mail twice. Baseline response was used for further QOL-analyses if answered within 14 days of information about the diagnosis. However, a few responses from ECOG Performance Status 0-1 patients are missing because they were rapidly admitted for surgical treatment without having answered the baseline questionnaires. Other responses failed because patients in PS 3-4 were too sick to answer questionnaires, but have agreed to enrolment and data collection from the hospital records.

7.3 Methods

7.3.1 Health related quality of life (HRQOL)

Quality of life is becoming more important as a hard end point in the research on cancer(44;45). Wyller maintains that QOL is a broad definition, that should be evaluated and described more thoroughly, especially seen from the patient's point of view(46). According to Campbell a general definition of quality of life is "a person's subjective feeling of well being as a result of his experience from life as a whole"(47). By narrowing the QOL description to those parts that are primarily related to health, the conception of health related QOL has emerged(48). There are many validated questionnaires on HRQOL for studies in patients with lung cancer(49-59). To be told that one suffers from cancer has large influence on people's life. Thus it is utmost important that a questionnaire that is to measure changes in quality of life during cancer, measures a broad spectrum of factors, such as physical activity, psychological well-being, social status and symptoms(60).

The European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 with the lung cancer specific supplement LC13(52) is well known, valid and reliable and measures the most common parameters(61-63). It is also translated to Norwegian, and has been used in many clinical studies. It is intended for the patient to answer personally(64;65).

The QLQ-C30 consists of 5 function scales (physical, role, emotional, cognitive and social), one global QOL scale, three symptom scales (pain, fatigue and nausea and vomiting), and several single symptom assessments. The LC13 holds additional, lung cancer specific symptoms associated with the disease and treatments. (Appendix I)

Such registrations can give important knowledge on how the different treatment modalities and symptoms influence every day among lung cancer patients.

Scoring has been performed according to scoring procedure(66), linearly transformed into a score from zero to 100. Among the function and global QOL scales, a high score represents a high level of functioning, whereas a high symptom score equals a high symptom load.

7.3.2 Anxiety and Depression

Emotional disturbances may result from the serious diagnosis of lung cancer, but pre-existing disease may also influence delays in the diagnostic process, as well as the experience of side effects from treatment. Previous studies have shown correlations between mood disorders and QOL(67), and more recently, after the start of this study, between mood disorders and coping abilities in lung cancer patients receiving specific treatments(44;68).

The Hospital Anxiety and Depression (HAD) questionnaire consists of 14 items of which half and half assess anxiety and depression, respectively. Each sub-score may vary from 0 to 21 points. The questionnaire has been widely validated and reliability tested (69;70). Scoring >8 points are defined as possible/borderline psychiatric disease, while >11 points indicate clinical depression or anxiety associated neurosis(70), as reported in several other studies(67;69). (Appendix II)

7.3.3 Mastery

People's life experience influences their perception of symptoms and illness, and their susceptibility to information.

Most of the experiences contributing to an individual's mastery are, according to Antonovsky(71), at large collected during childhood and early adulthood, and stabilise around the age of 30.

Dalgard et al(72) recently found that persons with a strong sense of mastery, as measured with the SoC, had lower psychological distress, judged by questions about depression, anxiety and psychosomatic symptoms. They also found an association between level of education and psychological distress.

The Sense of Coherence questionnaire (SoC) has been proven valid and reliable(71), and is widely used throughout the world(73;74), also in Norway(75). The 13 items are valued from 1 (weak coping ability) to 7 (strong coping ability). Total score results from summing up raw scores, and can range from 13 to 91. High values indicate high coping abilities. (Appendix III) Based on findings from studies on other patient groups(76;77), we set an arbitrary cut-off value at 55, defining scores equal or below 55 as low mastery.

7.3.4 Delays

According to the definitions of delays in the guidelines from the British Thoracic Society(19) and the Swedish Lung Cancer Group(20;21) the delays in the diagnostic process used in this study were defined as:

- **Patient delay** = Time from first symptom to first personal contact with doctor
- **GP delay** = Time from first contact with general practitioner (GP) to date on written referral
- **Referral delay** = Time from dated referral receipt to first contact with pulmonary consultant
- **Specialist delay** = Time from first contact with pulmonary consultant to dated diagnostic histology/cytology
- **Informed diagnostic delay** = Time from decision of doing a diagnostic procedure to informing patient of diagnosis. Thus, time from decision was stated as the date of referral receipt + 2 days, which is considered the mean time used (including weekends and public holidays) before a decision of diagnostic procedure/sequence was done
- **Hospital delay** = Time from first contact with pulmonary consultant to start of treatment
- **Total delay =** Time from first symptom to start of treatment

7.3.5 Patient satisfaction

Patients with symptoms of serious illness are worried and in need of empathy and repeated information. Patients have various reasons for reacting differently to information as well as to treatment-related side-effects.

A questionnaire concerning patient satisfaction with information and treatment from the medical institution and its employees was constructed on the basis of a questionnaire used for patient satisfaction validations in Norway, as developed by Centre for Health Care Evaluations(78). The pre-printed alternatives for answering were ranged from 1 to 5 or 1-7,

ranging from “very unsatisfactory” to “highly satisfactory”, and “absolutely not” to” definitely so”, concerning the last two questions. (Appendix IV) Total sum attainable, omitting questions 10 to 13, which were treatment specific, was 60. This questionnaire has been translated to English for the purpose of this thesis only (Appendix IVb).

7.3.6 Smoking habits and exposure to lung toxic substances

Concerning exposure to potential lung toxic substances, and knowing that Norwegians have a somewhat different tobacco consumption than other countries, a detailed questionnaire was constructed especially for the purpose of this study, asking about smoking, occupational exposures and comorbidities (Appendix V,VI). Questions were partly based on a previously used questionnaire from the Norwegian Directorate of Health(79), but were developed further in order to acquire more detailed data. Patients were asked about time of smoking debut, which brand and kind of tobacco they had smoked primarily, i.e. at least 50% or more, and which percentage of their consumption had been pack tobacco and fabricated cigarettes, respectively.

Patients were asked about the longest duration of education and main occupation, divided into groups categorizing according to expected exposure to lung toxic substances, such as nickel, asbestos and dust.

Measuring domestic radon in the homes of patients with diagnosed lung cancer was originally planned as part of this study, but we ran into legal complications, as we could not do measurements in people’s homes without informing them of the results, and authorities insisted that we must offer economic support in cases of increased radon measurements, for venting or rebuilding, if detected.

Drinking water was also considered a potential source of toxic exposure, but research revealed more than 90 different water sources supplying the area, in addition to single local wells. Thus, analyzing these sources in regard of traces of heavy metals and low pH would be very complicated, and, according to large epidemiological findings(27), a very small contributing reason, if any.

7.4 Statistical analysis

Statistical analyses were performed with SPSS 13-16 (Statistical Package for Social Sciences, SPSS Inc. Chicago, USA).

Regarding the number of patients in the study, no a priori power calculation of study size was performed. We considered that the inclusion of approximately 400 patients during a 3-year period would be adequate for sound analyses of several important parameters. We also expected this number of patients to be adequate for forthcoming survival analyses.

Continuous data with normal distribution were analyzed with Student's t-test, and presented with mean and standard deviation (SD), as central tendency and dispersion measure, respectively. Correspondingly, Mann-Whitney-U-test was used if distribution of data was skewed and presented with median and inter-quartile range (25.th and 75.th percentiles), respectively. Pearson's Chi Square test was used for categorical data comparing percentages.

Because our data on HRQOL proved largely non-linear, while most results from comparable studies were presented using t-test, analyses were performed both ways(66;80;81).

Simple and multiple logistic regression analyses were performed where necessary, using backward, stepwise conditional methods.

In cases of missing answers to EORTC questionnaires, a mean of related items was calculated and substituted, according to scoring instructions, in cases of function or symptom scales based on several answers if at least half of the items had been answered(66). Missing single answers were not substituted.

Differences in analyses were considered significant with a p of less than 0.05, in two-sided tests. According to recent recommendations(82), changes in HRQOL-parameters should be considered clinically significant if ten or more percent change towards improvement or worsening.

Because of missing comparable data on smokers of hand-rolled cigarettes in the region, a crude odds ratio (OR) for smokers of hand rolled cigarettes (HRC) was calculated, assuming an average Norwegian percentage of healthy smokers of HRC in the region.

The questions about effects and side-effects of treatment were omitted from the patient satisfaction analyses, as comparison to the group receiving BSC only would otherwise not be possible. Total sum was compared between groups, using independent samples t-test.

7.5 Ethics

The study was approved by the Regional Ethics Committee on Research and the National Data Supervision Centre, and is performed in accordance with the Helsinki Declaration.

8. Synopsis of papers I-IV

8.1 CAPPA – baseline characteristics of patients included in the study

42% of patients were female, mean age at the time of diagnosis was 68 years for both genders.

21% had SCLC, one third had adenocarcinoma. 72% of patients were in TNM stages IIIb or IV, thus beyond a curable condition.

For the group as a whole, 16% received surgery as primary treatment option (but 23% of patients with NSCLC), one third chemotherapy, one third supportive care only (table 1).

Table 1 Baseline characteristics of an unselected sample of patients with primary lung cancer in Southern Norway

	N= 479
Gender; male, %	58
Age, mean (SD)	68 (11)
Performance status ECOG, %	
- **0-2**	66
- **3-4**	34
Stage TNM, %	
- **1a-3a**	28
- **3b-4**	72
Histology, %	
- **SCLC**	21
- **NSCLC**	70
- **Unknown**	9
Primary treatment, %	
- **Surgery**	16
- **Radiation**	19
- **Chemotherapy**	31
- **Supportive Care**	34

8.2 Paper I

52% of patients contacted doctor within 3 weeks of first symptom of disease, and 49% were referred to specialist within 3 weeks of first contact with general practitioner. 71% of patients with lung cancer were evaluated by specialist in pulmonology within 1 week, not fulfilling the British or the Swedish recommendations of 100 or 80%, respectively. Correspondingly, informed diagnostic delay was within 2 weeks in 52%, and within 3 weeks in 68% of cases. 62% started treatment within 1 month of first contact with pulmonologist, whereas the Swedes suggest that 80% should.

Patients in advanced tumour stage had shorter delays than those with potentially operable disease, with smaller tumour masses, giving less symptoms and possibly more difficult to biopsy. Female gender, as well as SCLC histology, had shorter specialist- and hospital delays, respectively. Whether chest X-ray was performed before referral to the pulmonary consultant or not, did not influence the delay from GP to final diagnosis.

8.3 Paper II

63% of patients answered the EORTC questionnaire at the time of diagnosis. Those not answering, were older, had poorer performance status and there were more patients suffering from SCLC-Extensive Disease than among the responders.

Patients with SCLC reported more fatigue and sore mouth compared to those with NSCLC, and more depression ($p \leq 0.03$). Besides this, there were no differences in EORTC scores between histological groups. Compared with reference material from EORTC databases(83) from chemotherapy and radiotherapy studies, the results from CAPPA were considerably worse, especially concerning role, social and physical functions, global QOL, dyspnoea, diarrhoea and fatigue, documenting a higher burden of illness/symptoms than documented in the literature concerning treatment for the disease. Poor emotional function was associated with anxiety and depression ($p<0.0001$), and physical- and role functions were worse in cases of poor performance status ($p<0.0001$).

According to HAD, 17% of patients scored compatible with anxiety and 14% with depression and one in four consistent with manifest anxiety and/or depression. Cases of anxiety and depression seemed closely related, with a ten times increased OR for depression if concurrent anxiety compared to non-existing anxiety, as measured by HAD.

Mean SoC score was 58.3. Mastery, measured by SoC, was significantly lower in patients with mood disorders than without.

According to these findings clinicians might need to spend more time on information, and be more devoted to upcoming questions from patients with lung cancer and mood disorders.

8.4 Paper III

81% of patients responded to the smoking questionnaires. 95% of patients in CAPPA had a smoking history, while 55% were current smokers.

21 patients (4%) had never smoked, but one-third of these reported living with another smoker for at least ten years. The never-smokers were 7 years older than ever-smokers when lung cancer was diagnosed. There was a considerable incidence of adenocarcinoma among the never-smokers (62% vs 33%), and 3 patients had features of bronchioloalveolar carcinoma (BAC).

88% of ever-smokers reported having smoked primarily hand-rolled cigarettes (HRC). These had more frequently started smoking at a young age, 54% before age 17, compared with 37% among smokers of fabricated cigarettes (FC), $p=0.04$, χ^2-test.

Very few smokers reported using filter when smoking, 21 patients totally, whereof 9 smoking FC. Because of low numbers, further analyses were not performed.

Smokers of HRC had smoked in average 5 years longer than those smoking fabricated cigarettes as the disease was diagnosed. However, they had smoked fewer cigarettes per day (15) and consumed significantly less pack-years of tobacco (35) than those smoking fabricated cigarettes (20 and 42, $p<0.0001$ and $p=0.021$, respectively) (table 2).

Table 2 Tobacco consumption in smokers of hand-rolled cigarettes compared with fabricated cigarettes in patients with newly diagnosed lung cancer in Agder. [Student's t-test; Mean (SD)]

	Hand-rolled cigarettes (n=284)	Fabricated cigarettes (n=39)	p (95% CI)
Age starting	17 (4)	19 (3)	0.07 (-0.1 to 3)
Years smoking	46 (10)	41 (14)	0.009 (1 to 9)
Pack-years	34 (18)	42 (25)	0.021 (-14 to -1)
Average cigarettes/day	15 (7)	20 (10)	0.0001 (-8 to -2)
Maximum cigarettes/day	20 (12)	26 (13)	0.013 (-9 to -1)

The use of hand-rolled cigarettes was considerably more frequent in this study than expected from official sales statistics. Assuming a similar smoking pattern as reported in national statistics, smoking hand-rolled cigarettes revealed an OR of 13 for developing lung cancer compared to smoking fabricated cigarettes.

The use of hand-rolled cigarettes among people developing lung cancer in Southern Norway thus is more prevalent than known from official sales statistics. The results may indicate that smokers of hand-rolled cigarettes seem to have a greatly increased risk for lung cancer compared to smokers of fabricated cigarettes.

8.5 Paper IV

87% of patients responding to the EORTC QLQ C30-questionnaire at baseline, and still alive, answered the follow-up questionnaires after primary treatment sequence. As a group, they reported significant worsening of physical function, role function, fatigue, pain, constipation, financial troubles, dysphagia, dyspnoea and alopecia (all p's <0.02), but less haemoptysis. Among patients with NSCLC each treatment group reported worsening of parameters especially connected to treatment modality, as operated patients had significantly more dyspnoea and worse role function compared with those receiving chemo- or radiotherapy. Receiving radiation therapy was associated with more fatigue than treatment with chemotherapy (p=0.01) for changes of at least 10%, which is defined as clinically significant.

Patients with NSCLC receiving active treatment and in good ECOG PS (0-1) experienced worsening of physical(mean -15, SD24) and role function (-14 (42)) after treatment, while

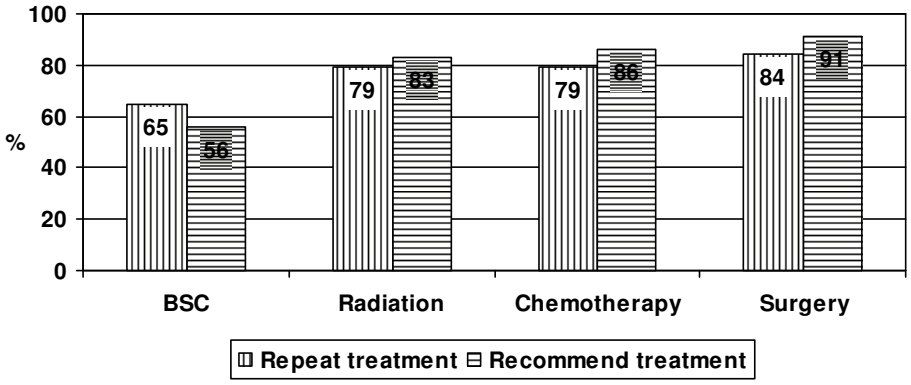
those in poorer PS (2) reported improved emotional (15 (34))and role function (13 (38), p's<0.05).

Patients with anxiety and / or depression at baseline reported reduced emotional disturbances after treatment.

One third of patients with lung cancer scored below 55, i.e. compatible with low mastery. This group had poorer physical, emotional, social and cognitive functions and global QoL-score at baseline (all p's <0.03), and higher anxiety and depression scores (p's<0.02) than those with "normal mastery" above 55.

Patients receiving active treatments reported more total satisfaction with treatment received, 41 mean, SD 8, than those receiving BSC alone, 33(9), (p<0.0001). 84% of patients receiving surgery as primary treatment would definitely or probably repeat this, compared to 79% of patients receiving chemo- or radiotherapy, and 65% of those having BSC only. Similarly, 91% of patients receiving surgery would recommend this to others, compared to 56% of the BSC-group (p<0.0001), figure 3. 55% of patients receiving active treatment would definitely repeat, only 15% in the BSC-group.

Figure3. Patients' willingness to repeat or to recommend same treatment modality in case of new, similar diagnosis



9 General discussion

9.1 Methodological considerations

9.1.1 General

As clinicians taking care of all patients with lung cancer, we found it essential to include all patients in the study, not only those eligible for tumour-reducing treatments. However, it is a problem to get adequate response to questionnaires from those most diseased from their lung cancer, thus increasing the possibility of a somewhat biased result, missing more responses from the patients in poorest PS. We believe our results conveying HRQOL, mood disorders and mastery in an unselected population of lung cancer patients are closer to "the real world" of daily clinic than most published, treatment-related studies. We hope this can add important data for comparisons and basics for treatment-decisions in the large body of patients whom are unsuited for partaking in studies run by the pharmaceutical industry, or whom are not interested in palliation chemo- or radiotherapy.

9.1.2 Information bias

By introducing a study evaluating the process of diagnostics of a group of patients, there is a risk that knowledge thereof might increase the attention upon the evaluated process, thus risking a certain shortening of some of the measured delays, as involved colleagues know that the time is being registered, and more attention on symptoms and feelings regarding quality of life. However, there are no specific reasons why information bias in this study should be especially troublesome compared to other comparable studies.

9.1.3 Selection bias

63% of included patients responded to questionnaires at baseline within the defined time limit of 14 days after diagnosis. Compared to large treatment-related studies selecting a small group of patients with lung cancer in performance status 0-1, this seems like a poor result. However, we have intended to evaluate the entire patient population, as we do in the general lung cancer clinic. The patients being in the poorest performance status at baseline are the ones least able to respond to questionnaires. Nevertheless, many have answered, and our results are thus different from "comparable" studies(52;84), even if not all patients have replied.

87% of patients answering the HRQOL questionnaires within defined time limit at baseline and still alive responded to the follow-up questionnaires. We find this a good compliance, but realize, of course, that the most diseased patients are missing, introducing a selection bias here, due to deaths and increased morbidity. However, literature shows a connection between deteriorating PS and increasing symptoms(52). We found that patients in poor performance status (PS3-4) had worse functions and more symptoms at baseline than those in PS 0-2. We thus believe that the non-responders would have reported similarly poor results of HRQOL, as most of them were in PS 3-4, thus making the total scores for the whole unselected patient population even worse.

9.1.4 Recollection bias

Patients were asked to report their smoking history. This is a retrospective registration. People seldom report more than actual smoking over time, and often less (85). It is unlikely that smokers of hand-rolled cigarettes should report differently compared to smokers of fabricated cigarettes. If the results are biased, actual use of tobacco products should probably be higher for both groups.

Concerning amount smoked, we asked about average number of cigarettes and packs of tobacco, and the reported numbers correlated well, assuming that 50 grams tobacco make 50 cigarettes.

9.2 Discussion of some of the main results

9.2.1 Delays

Having no national recommendations on acceptable delays in the diagnostic process of lung cancer, it seemed important to map out our local process and concentrate upon possible areas of improvement. Although we found the British recommendations hardly suitable for general practice, recommending 100% of patients diagnosed and informed within 2 weeks, they suggest the ideal situation, for which we should aim. Our hospitals diagnosed within the British recommendations in 52% of cases, which is not good enough, by far. However, the delays in our study were within those of the Swedish Lung Cancer Group in 62-71%.

Acquiring good biopsies without performing hazardous examinations sometimes takes time, but performed by trained physicians and within a planned schedule, the gross body of patients

should have their diagnosis and plan of treatment within 3 weeks of first meeting the pulmonologist. Our out-patient clinic has since the time of the study continuously remodelled the diagnostic work-up of suspected lung cancer patients in order to increase efficiency and shorten delays where possible. However, through more accurate diagnostic methods recently available, such as PET-CT and EBUS, where patients now are referred to regional central hospitals due to political decisions and prioritized allocation of resources, the delays in the diagnostic processes are again increasing.

9.2.2 Choice of and response rates to questionnaires

9.2.2.1HRQOL questionnaires

We could have chosen another HRQOL-questionnaire, but the EORTC form was well tested, translated and used in many studies in Norway and world-wide, and was thus evaluated as the best choice.

Through the study, we have done painful experiences concerning our choice of the EORTC-questionnaires, which proved less suitable for an unselected patient population, although originally described as "for assessing the HRQOL of cancer patients participating in international clinical trials"(66). The EORTC QLQ-C30 is the most common cancer-related HRQOL questionnaire used in the Nordic countries. However, the much used, validated and tested EORTC questionnaires QLQ-C30 and LC13 met basical statistical challenges in this real life study on an unselected patient population due to a much larger dispersion of HRQOL data with all patients included, i.e. also many in poor performance status, compared to what is common in treatment related trials, where only patients in PS 0-1 and sometimes PS 2 are included. The recommended statistics to be used with the EORTC questionnaires are t-tests, due to normal distribution and thereby less dispersion of data in more selected samples of patients in treatment related studies. In this situation, to compare our results with previous publications, we also performed the analyses with the recommended t-tests. However, based on purely statistical assumptions, the Mann Whitney U (MWU) test could several times have been used instead. Thus, the EORTC results were also tested with MWU tests when statistical assumptions were fulfilled, resulting in only minor and less important deviations from what is concluded in the articles.

With this experience, we judge the EORTC questionnaires to be definitely less suitable for real life studies and see the need for simpler and more suitable questionnaires for real life settings. This could be a topic for future research, performed on an unselected patient population, as most clinicians meet in their clinics, rather than a highly selected group fit for receiving new pharmaceuticals.

9.2.2.2Response rates

Many questionnaires have been invented and tested in order to evaluate HRQOL, which is increasingly utilized in cancer studies(86;87). Mills et al found that lung cancer patients registering QOL weekly reported that it had a negative impact on their lives compared to those who did not(88). Health care professionals should be trained to incorporate patient-QOL-changes into daily practice to make the response "worth-while" and make the patient feel "rewarded" for responding to questionnaires(88). It is difficult to find the right frequency of recording HRQOL to detect meaningful changes without losing patients before next response, parallel to not overloading the patients with forms, making them stressed by the work-load and putting too much attention to their disease and possible changes in symptoms. Sundstrøm concluded that it is most important to ensure good compliance on HRQOL questionnaires at baseline(81).

Crude response rate in our study was better than shown in figure 2 (page 13), but some patients needed more time before submitting their response, others received the questionnaires late because of concurrent procedures or treatment.

In an unselected patient population suffering from a progressive disease with poor prognosis, such as lung cancer, and concurrently associated with high comorbidity, it is difficult to make all patients give a written response within 14 days of receiving such a serious diagnosis. Knowing that this has been a problem in prior studies, as well (84), we repeatedly contacted the patients by mail and/or telephone, but some times responses came later than desired and the answers had to be discarded from further analyses. As the patients became more acquainted with the study, responses were better, and thus the follow-up rate was better among those responding within the baseline time-limit and still alive (87%, paper IV). There

are different ways of substituting missing answers, but we have chosen not to impute whole series of answers in cases of non-responders. The main non-responding population at baseline was too ill to answer, and our hypothesis is that the main results on HRQOL would have been worse if this group had been able to respond. This assumption is supported by several others, suggesting that measuring performance status may serve as a surrogate marker of QOL(89;90).

We still believe the response rates in this study are high standards for an unselected population of primary lung cancer, and that these results mirror actual findings obtainable in clinical practice.

9.2.2.3Changes in HRQOL

The reported changes in HRQOL from the time of diagnosis to the end of first treatment cycle are considered treatment-specific, revealing no really surprising results for the trained clinician. However, the characterisation of these parameter changes in an unselected sample of patients are again considered important in an attempt to describe real life settings when lung cancer is treated. These results should therefore be applicable for many lung physicians. Surgery has recently been described to decrease functional scales(80;91), but only for some months. In a survey on lung cancer patients treated with radiation, Langendijk found lasting deterioration in functional scores, while fatigue improved shortly after ended treatment, only to increase again after 3 months(91).

Post-treatment response to HRQOL questionnaires is difficult to collect systematically enough for proper comparisons between groups. Patients receiving BSC only are at large in poor performance status at baseline, with poorer survival than those receiving active treatments. The number of patients fit enough for adequate responses to questionnairres falls quickly. We considered collecting post-treatment response 3-4 weeks after ended treatment to be adequate, to assess transient treatment effects also among those patients deteriorating rapidly after finishing a treatment cycle. However, responses from patients shortly after radiotherapy or surgery are probably different from responses collected 6-8 weeks later(80;91;92), an interval often followed in the out-patient clinic. A prolonged response

interval after radiation therapy and surgery may have improved the HRQOL scores somehwat in this group, if chosen.

9.2.2.4Patient satisfaction

Patient satisfaction with treatment received, additionally to treatment effects and survival, are measures on quality of care. In order to further scrutinize the reasons behind some patients and relatives expressing regrets concerning treatment received or not received, two questions were raised after first treatment, or, if BSC alone, at first control, asking if they would have accepted the same treatment again, knowing what was ahead, if receiving the diagnosis now. Similarly, if they would recommend their treatment sequence to close peers. Of course, knowing that the responses will be known within the treating institution may influence the response, making the patient less critical than if asked by an independent part. However, the questionnaire was handed out or mailed by a study nurse or –physician, mostly not responsible for the treatment. Not surprisingly, patients receiving no active tumour-directed treatments were the least satisfied. Thus, the clinicians need to improve our skills at explaining seriously ill lung cancer patients why treatment beyond pure symptomatic care in some cases means more side effects than gains, as the patients express doubts concerning whether they have been offered the best treatment available for their disease.

9.2.3 Smoking hand-rolled cigarettes

9.2.3.1Registering smoking habits

We were surprised that 88% of ever-smokers reported smoking primarily hand-rolled cigarettes, although it confirmed the general impression from working in the clinic. Because of missing data on type of tobacco smoked in the general Norwegian population, basis for comparison is missing. There has previously been local tobacco production in Kristiansand, with two processing plants. Several patients have reported receiving packs of local tobacco brands from relatives for Christmas during adolescence, thus indicating recruitment of young smokers. Neither tobacco companies nor their marketing agency have been cooperative upon our requests concerning local sales or statistics on type or brand of tobacco products over time in the region. National statistics have done very narrow research on smoking, mostly limited to: Are you smoking? with the ticking off on “yes” or “no” and user age.

Our questioning, asking people who have developed a serious, mostly incurable disease, about detailed smoking habits, which is known as the main reason for developing lung cancer, is debatable. Patients developing lung cancer who continue smoking, have been reported to have poorer QOL than former smokers(93-95), possibly because of bad conscience and negative stigmata concerning their smoking. However, none of the participants of this study have offered any negative comments to the detailed questioning. Registrations of smoking habits have to be retrospective, based on the patient's memory. We asked about which kind of cigarettes and tobacco the smokers had used the most, and which percentage had been HRC, FC etc. For the convenience of analyses, we have chosen to register the kind smoked more than 50%, which is, of course, a rough calculation. Brands of cigarettes and tobacco were grouped according to tobacco and tar contents and filter, as many patients have used several different brands, but often within similar tobacco-strengths. Some authors define HRC-smokers as smoking strictly pack tobacco(8), while others refer more generally(38).

Several patients have alternated between hand rolled cigarettes (HRC) and fabricated cigarettes (FC), and the 5% increased occurrence of adenocarcinoma compared to country-mean could indicate consumption of more fabricated "light" cigarettes, which, due to content and smoking pattern, are shown to induce more adenocarcinomas(96).However, we believe that most smokers report correctly concerning which type of cigarettes they have used mostly, also because they have reported number of packs of tobacco weekly in cases of using HRC. Average number of daily cigarettes smoked was 15 in the HRC group. This is comparable with a large population survey(97), and shows that those who develop cancer are not necessarily excessive smokers, but that the group has several other known risk factors on their behalf, such as early smoking debut, long duration of smoking and no filter(98-100).

This study has taught us that it is difficult to register detailed facts on smoking in a perspicious way.

9.2.3.2Risk estimate

The calculated odds ratio of 13 of developing lung cancer if smoking HRC compared to FC is a very coarse calculation, based on several discussable assumptions, stipulating that the

remaining smoking population in the region are all healthy, and assuming a smoking pattern in Agder comparable to the national average regarding brand, type and quantity. An OR of 13 seems, also to us, high, and is most likely an over-estimation. However, missing all sales data from the tobacco companies, we have no better numbers to base our calculations on. DeStéfani indicates a 30% increased risk for lung cancer in smokers of HRC in Uruguay(35), supporting our assumptions, but such comparisons between countries and continents are not straight forward. Very recent data indicate substantial national differences in carcinogenic contents of tobacco(101). No exact survey on the detailed contents on tobacco products exist world wide. Thus, locally produced pack tobacco might even contain more carcinogens than known, comparable brands from former testing. However, these are only assumptions, and cannot be further investigated due to lacking cooperation from the local tobacco companies.

9.2.3.3Addiction

As found previously(102), still no more than half of the patients had quitted smoking before lung cancer was diagnosed. One third of former smokers had quitted within the last year before diagnosis. Smokers often seem to wait until serious symptoms appear before quitting. As lung cancer often starts with no or unspecific symptoms, similar to previously experienced in periods (bronchitis, cough and phlegm), increased attention should be paid on informing and motivating smokers to quit before developing serious symptoms and cancer. In a recent survey, Lund(8) showed that smokers of HRC often believed pack tobacco to be less hazardous for their health than FC. Smokers of HRC are often characterized as more addicted to nicotine and as having more difficulties quitting, than those smoking FC(103). Similarly, smokers starting at a young age often have more difficulties quitting later(8).

9.2.3.4Demands for action

The Norwegian authorities have recently banned smoking in public, in restaurants and in most schools, thereby reducing the incidence of smoking in the population and especially among the teenagers. Pack tobacco is still less expensive than fabricated cigarettes, and is thus more used by adolescents with a tight economy and early smoking debut. Taxes have recently been raised, thus making both kinds of cigarettes more expensive and more

comparable in price. These actions reduce early smoking debut, and especially early start with pack tobacco, which may seem more addictive than FC.

For comparison, the consumption of HRC is reported to rise again in other developed countries, due to price-differences, similar to the previous situation in Norway(103;104).

Although we suggest FC carrying a somewhat lower risk of developing lung cancer than HRC, ninety-five percent of patients developing lung cancer in Southern Norway were ever-smokers. Primarily, avoiding smoking debut, secondarily, increasing quit-rates among smokers are the most important efforts for reducing the incidence of this serious disease.

10 Conclusion, clinical implications and future perspectives

10.1 Conclusion

This study showed that the delays in the diagnostic process were according to international recommendations in 52 to 71% of cases, and revealed thereby several potentials for improvement.

We have not been able to establish the reason for the high incidence of lung cancer in Southern Norway, except the finding that nine out of ten ever smokers developing lung cancer in the region reported having smoked primarily hand-rolled cigarettes. This, together with a clearer dose-response relationship among smokers of HRC than FC among those developing lung cancers, leaves a distinct suspicion that HRC are more carcinogenic than the worldwide more commonly used, fabricated cigarettes (FC).

In this unselected sample of patients with lung cancer, HRQOL was reported worse than in reference values from other studies of more selected groups, documenting a higher burden of illness than previously shown. Mood disorders were common and associated with reduced functions and increased symptoms compared to those without anxiety or depression.

The changes in HRQOL after first treatment modality were mostly correlated with disease progression and side-effects of treatment. Patients with mood disorders may be a group of patients which could profit from more information and closer follow-up to reduce symptoms in future.

Patients receiving active tumour reducing treatments were more willing to repeat or recommend the same treatment sequence than those who received BSC only.

We also find a need for developing new tools for evaluating HRQOL in unselected patient populations.

10.2 Clinical implications

The survey showed that some patients are referred under misleading diagnoses or symptoms, such as “cough”, not necessarily leading to hasty admittance or primarily cancer-directed

examinations if not mentioned in the referral letter. We have later informed GPs in the region about the necessity of expressing a suspicion of malignancy, if any, to facilitate rapid examinations. In order to shorten specialist delay, we have started to refer some patients directly to tru-cut lung biopsy as first examination, instead of bronchoscopy, if tumour is peripheral. Resources are, recently, added specifically to increase efficiency in diagnosing malignant tumours of the lung, i.e. endoscopic ultrasound (EUS) guided fine needle aspiration cytology (FNAC) along the oesophagus and endobronchial ultrasound (EBUS) guided FNAC.

Because our findings indicate that patients with mood disorders have reduced function and more symptoms from their disease, they may need more information and closer follow-up throughout the diagnostic process and treatment. We now have a lung cancer out-patient clinic with trained nurses being available 2 to 3 days a week, and a responsible physician, answering calls and extra visits whenever needed by patients with lung cancer. Patient feed-back on this is utterly positive.

The authorities have done important legislative changes to reduce general tobacco consumption in Norway. We still find it of utmost importance to inform the public about the increased risk of smoking hand-rolled cigarettes compared to fabricated, even though no smoking is the most desirable goal for the entire population.

10.3 Future perspectives

Since initiating this study, important changes in smoking habits have taken place. Smoking was prohibited in public places in Norway in 2003 and smoking was banned from all restaurants June 1, 2004(105). Taxes on hand-rolled tobacco are somewhat raised, but still do not equal fabricated cigarette prices.

All together, the Norwegian policymakers have done significant measures to reduce tobacco smoking, and the prevalence of daily smokers has been reduced to 21% of adults among both genders in 2008. Accordingly, the incidence of lung cancer in Norway is expected to fall throughout the next 30 years, as well as several cardiovascular diseases and COPD.

It is still desirable to get an overview of the market share of pack tobacco sold and used in the region of Southern Norway, though the smoking incidence is rapidly falling. Hopefully this detail can be implemented in the next large statistical survey on smoking habits. Further, a future study measuring residential radon in the homes of lung cancer patients in Agder would still be very interesting, and this has also been expressed by patients themselves.

HRQOL questionnaires, HAD and SoC have not been implemented in the daily surveillance of lung cancer patients in our clinic, but we have learned that patients expressing signs of anxiety or depression may percept more symptoms of disease and treatment, and should possibly be met with more information and more frequent follow-up.

Data on survival of this unselected patient population receiving different treatment regimes will be analyzed later.

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12 Appendix I-VI

(English versions: number+b)

Appendix no	Norwegian title	English title
I	EORTC QLQ C30 (version 3.0) og LC13	EORTC QLQ C30 & LC13
II	HAD (Hospital anxiety and depression scale)	HAD
III	Livsorientering (Sense of Coherence 13)	Sense of Coherence
IV	Pasienterfaringer	IVb Patient experiences
V	Spørreskjema ved diagnose	Questions at baseline–see appendix, paper III
VI	Tjære og nikotin i sigaretter på det norske markedet	Tar and nicotine levels in tobacco brands on the Norwegian market (Norwegian only)

Appendix I

EORTC QLQ - C30 *(version 3.0.)*

Vi er interessert i forhold vedrørende deg og din helse. Vær så vennlig å besvare hvert spørsmål ved å sette en ring rundt det tallet som best beskriver din tilstand. Det er ingen "riktige" eller "gale" svar. Alle opplysningene vil bli behandlet konfidensielt.

	Ikke i det hele tatt	**Litt**	**Endel**	**Svært mye**
1. Har du vanskeligheter med å utføre anstrengende aktiviteter, slik som å bære en tung handlekurv eller en koffert?	1	2	3	4
2. Har du vanskeligheter med å gå en lang tur?	1	2	3	4
3. Har du vanskeligheter med å gå en kort tur utendørs?	1	2	3	4
4. Er du nødt til å ligge til sengs eller sitte i en stol i løpet av dagen?	1	2	3	4
5. Trenger du hjelp til å spise, kle på deg, vaske deg eller gå på toalettet?	1	2	3	4
I løpet av den siste uka:	**Ikke i det hele tatt**	**Litt**	**Endel**	**Svært mye**
6. Har du hatt redusert evne til å arbeide eller utføre andre daglige aktiviteter?	1	2	3	4
7. Har du hatt redusert evne til å utføre dine hobbyer eller andre fritidsaktiviteter?	1	2	3	4
8. Har du vært tung i pusten?	1	2	3	4
9. Har du hatt smerter?	1	2	3	4
10. Har du hatt behov for å hvile?	1	2	3	4
11. Har du hatt søvnproblemer?	1	2	3	4
12. Har du følt deg slapp?	1	2	3	4
13. Har du hatt dårlig matlyst?	1	2	3	4
14. Har du vært kvalm?	1	2	3	4
I løpet av den siste uka:	**Ikke i det hele tatt**	**Litt**	**Endel**	**Svært mye**
15. Har du kastet opp?	1	2	3	4
16. Har du hatt treg mage?	1	2	3	4
17. Har du hatt løs mage?	1	2	3	4
18. Har du følt deg trett?	1	2	3	4
19. Har smerter påvirket dine daglige aktiviteter?	1	2	3	4
20. Har du hatt problemer med å konsentrere deg, f.eks. med å lese en avis eller se på TV?	1	2	3	4
21. Har du følt deg anspent?	1	2	3	4
22. Har du vært engstelig?	1	2	3	4
23. Har du følt deg irritabel?	1	2	3	4
24. Har du følt deg deprimert?	1	2	3	4
25. Har du hatt problemer med å huske ting?	1	2	3	4

26. Har din fysiske tilstand eller medisinske behandling påvirket ditt familieliv? 1 2 3 4

27. Har din fysiske tilstand eller medisinske behandling påvirket dine sosiale aktiviteter? 1 2 3 4

28. Har din fysiske tilstand eller medisinske behandling gitt deg økonomiske problemer? 1 2 3 4

Som svar på de neste spørsmålene sett en ring rundt det tallet fra 1 til 7 som best beskriver din tilstand

29. Hvordan har din helse vært i løpet av den siste uka?

1	2	3	4	5	6	7
Svært dårlig						Helt utmerket

30. Hvordan har livskvaliteten din vært i løpet av den siste uka?

1	2	3	4	5	6	7
Svært dårlig						Helt utmerket

EORTC QLQ - LC13

Endel pasienter opplever av og til at har noen av følgende symptomer eller problemer. Vær vennlig å angi i hvilken grad du har hatt disse symptomene eller problemene i løpet av den siste uka. Sett en ring rundt det tallet som best beskriver din tilstand.

I løpet av den siste uka:	**Ikke i det hele tatt**	**Litt**	**Endel**	**Svært mye**
31. Hvor mye har du hostet ?	1	2	3	4
32. Har du hostet blod ?	1	2	3	4
33. Har du vært tungpustet i hvile ?	1	2	3	4
34. Har du vært tungpustet når du har gått ?	1	2	3	4
35. Har du vært tungpustet når du har gått i trapper ?	1	2	3	4
36. Har du vært sår i munnen eller på tungen ?	1	2	3	4
37. Har du hatt svelgproblemer ?	1	2	3	4
38. Har du hatt prikkinget (stikninger) i hendene eller i bena ?	1	2	3	4
39. Har du hatt håravfall ?	1	2	3	4
40. Har du hatt smerter i brystet ?	1	2	3	4
41. Har du hatt smerter i arm eller skulder ?	1	2	3	4
42. Har du hatt smerter i andre deler av kroppen ?	1	2	3	4
Hvis ja, hvor har du hatt vondt ? _____				
43. Har du brukt smertestillende medisiner ? **1. Nei 2. Ja**				
Hvis Ja, hvor mye har det hjulpet ?	1	2	3	4

Appendix II

HAD

Følelser spiller en stor rolle ved de fleste sykdommer. Her kommer noen spørsmål om hvordan du føler deg.
For hvert spørsmål krysser du av for ***ett*** av de fire svarene som best beskriver dine følelser **den sisten uken**. Ikke tenk for lenge på svaret – de spontane svarene er best.

(Fylles ut av pasienten)

1. Jeg føler meg nervøs og urolig
   - -mesteparten av tiden ≤
   - -mye av tiden ≤
   - -fra tid til annen ≤
   - -ikke i det hele tatt ≤

2. Jeg gleder meg fortsatt over tingene slik jeg pleide før
   - -avgjort like mye ≤
   - -ikke fullt så mye ≤
   - -bare lite grann ≤
   - -ikke i det hele tatt ≤

3. Jeg har en uroføelse som om noe forferdelig vil skje
   - -ja, og noe svært ille ≤
   - -ja, ikke så veldig mye ≤
   - -litt, bekymrer meg lite ≤
   - -ikke i det hele tatt ≤

4. Jeg kan le og se det morsomme i situasjoner
   - -like mye nå som før ≤
   - -ikke like mye nå som før ≤
   - -avgjort ikke som før ≤
   - -ikke i det hele tatt ≤

5. Jeg har hodet fullt av bekymringer
   - -veldig ofte ≤
   - -ganske ofte ≤
   - -av og til ≤
   - -en gang i blant ≤

6. Jeg er i godt humør
   - -aldri ≤
   - -noen ganger ≤
   - -ganske ofte ≤
   - -for det meste ≤

7. Jeg kan sitte i fred og ro og kjenne meg avslappet
   - -ja, helt klart ≤
   - -vanligvis ≤
   - -ikke så ofte ≤
   - -ikke i det hele tatt ≤

8. Jeg føler meg som om alt går langsommere
   - -nesten hele tiden ≤
   - -svært ofte ≤
   - -fra tid til annen ≤
   - -ikke i det hele tatt ≤

9. Jeg føler meg urolig som om jeg har sommerfugler i magen
   - -ikke i det hele tatt ≤
   - -fra tid til annen ≤
   - -ganske ofte ≤
   - -svært ofte ≤

10. Jeg bryr meg ikke lenger om hvordan jeg ser ut
    - -ja, jeg har sluttet å bry meg ≤
    - -ikke som jeg burde ≤
    - -kan hende ikke nok ≤
    - -bryr meg som før ≤

11. Jeg er rastløs som om jeg stadig må være aktiv
    - -uten tvil svært mye ≤
    - -ganske mye ≤
    - -ikke så veldig mye ≤
    - -ikke i det hele tatt ≤

12. Jeg ser med glede frem til hendelser og ting
    - -like mye som før ≤
    - -heller mindre enn før ≤
    - -avgjort mindre enn før ≤
    - -nesten ikke i det hele tatt ≤

13. Jeg kan plutselig få en følelse av panikk
    - -uten tvil svært ofte ≤
    - -ganske ofte ≤
    - -ikke så veldig ofte ≤
    - -ikke i det hele tatt ≤

14. Jeg kan glede meg over gode bøker, radio og TV
    - -ofte ≤
    - -fra tid til annen ≤
    - -ikke så ofte ≤
    - -svært sjelden ≤

Livsorientering (Sense of Coherence 13)

Her kommer noen spørsmål som kan være litt vriene å svare på, men gjør så godt du kan, og ikke bli gående og grunne altfor lenge før du krysser av i den ruten som passer for ditt svar.
Svarene blir behandlet fortrolig, og kun til forskningsformål.

-fylles ut av pasienten. ***Kryss av i den ruten som passer for ditt svar***

1. Har du følelsen av at du egentlig ikke bryr deg om hva som foregår rundt deg?

Svært sjelden **Svært ofte eller aldri**

2. Har det hendt at du ble overrasket over oppførselen til personer som du trodde du kjente godt?

Har aldri hendt **Har ofte hendt**

3. Har det hendt at personer som du hadde regnet med, skuffet deg?

Har aldri hendt **Har ofte hendt**

4. Hittil har livet ditt:

Helt savnet mål og mening **Gjennomgående hatt mål og mening**

5. Føler du deg urettferdig behandlet?

Svært ofte **Svært sjelden eller aldri**

6. Har du noen ganger følelsen av at du er i en ukjent situasjon og ikke vet hva du skal gjøre?

Svært ofte **Svært sjelden eller aldri**

7. Å gjøre de tingene du gjør hver dag, er:

En til glede og dyp tilfredsstillelse **En kilde til smerte og kjedsomhet**

8. Har du svært motstridende tanker og følelser?

Svært ofte **Svært sjelden eller aldri**

9. Hender det at du har følelser inne i deg som du helst ikke vil føle?

Svært ofte **Svært sjelden eller aldri**

10. Mange mennesker – selv de med sterk selvfølelser – føler seg iblant som en ”ulykkesfugl”. Hvor ofte har du kjent det slik?

Aldri **Svært ofte**

11. Når et eller annet har hendt, har du da vanligvis oppdaget at:

Du overvurderte eller Undervurderte dets betydning — **Du så saken i sin rette proporsjon**

12. Hvor ofte føler du at det ikke er noen mening i det du gjør i ditt daglige liv?

Svært ofte — **Svært sjelden eller aldri**

13. Hvor ofte har du følelser som du ikke er sikker på at du kan holde under kontroll?

Svært ofte — **Svært sjelden eller aldri**

Appendix IV

Pasienterfaringer

Vi ønsker å spørre om dine erfaringer i kontakten med sykehuset i behandlingen av din kreftsykdom.

Du skal nå kun svare på dine erfaringer

ved diagnose -ved operasjon -ved strålebehandling
-ved cellegiftbehandling -ved oppfølging med Best Supportive Care

Vennligst kryss av i én av rutene for hvert spørsmål. (Svarene vil bli behandlet anonymt.)

1. Når det gjelder behandlingen du har mottatt for din lungesykdom, hva synes du om lungeseksjonen? kirurgisk avdeling? Senter for Kreftbehandling?
   Til denne behandlingsenheten har jeg:

Ingen tillit **1**	Liten tillit **2**	Stor tillit **3**	Meget stor tillit **4**	Svært stor tillit **5**

2. Hva synes du alt i alt om den pleie og medisinske behandlingen du har fått ved sykehuset?
   Jeg er:

Svært utilfreds **1**	Meget utilfreds **2**	Utilfreds **3**	Verken tilfreds eller utilfreds **4**	Tilfreds **5**	Meget tilfreds **6**	Svært tilfreds **7**

3. Når det gjelder mine muligheter til å fortelle personalet om alt som var viktig om min lungesykdom, er jeg:

Svært utilfreds **1**	Meget utilfreds **2**	Utilfreds **3**	Verken tilfreds eller utilfreds **4**	Tilfreds **5**	Meget tilfreds **6**	Svært tilfreds **7**

4. Hva synes du om legenes informasjon til deg?
   Den informasjonen legene ga meg var:

Svært lite forståelig **1**	Meget lite forståelig **2**	Lite forståelig **3**	Verken eller **4**	Godt forståelig **5**	Meget godt forståelig **6**	Svært godt forståelig **7**

5. Har du fått vite det du syntes var nødvendig om hvordan undersøkelser skulle foregå mens lungesykdommen ble utredet?

Nei, jeg fikk ikke vite noe **1**	Jeg fikk vite for lite **2**	Jeg fikk vite en del **3**	Jeg fikk vite det meste **4**	Ja, jeg fikk vite alt jeg trengte **5**

6. Føler du at legene har hatt omsorg for deg?
   Jeg føler at legene har hatt:

Svært liten omsorg **1**	Liten omsorg **2**	Verken eller **3**	Stor omsorg **4**	Svært stor omsorg **5**

7. Føler du at sykepleierne har hatt omsorg for deg?
   Jeg føler at sykepleierne har hatt:

Svært liten omsorg **1**	Liten omsorg **2**	Verken eller **3**	Stor omsorg **4**	Svært stor omsorg **5**

8. Har du opplevde at det har vært én lege som har hatt hovedansvaret for deg under oppholdet?
   Ja Nei

9. Hadde du, da du forlot sykehuset, fått informasjon om hva som feilte deg?

Nei, jeg fikk ikke vite noe **1**	Jeg fikk for lite infor-masjon **2**	Jeg fikk vite en del **3**	Jeg fikk vite det meste **4**	Ja, jeg fikk vite alt jeg trengte **5**

Videre kommer noen spørsmål knyttet opp mot sykdommen og den gjennomgåtte behandlingen:

10. Hvor belastende synes du denne behandlingen har vært for deg?

Overhodet ikke plagsom **5**	Litt plagsom **4**	Nokså plagsom **3**	Meget plagsom **2**	Sterkt plagsom **1**

Ikke aktuelt

11. Når det gjelder informasjonen du har fått om virkninger og bivirkninger av den behandling du har mottatt, er du:

Svært utilfreds **1**	Meget utilfreds **2**	Utilfreds **3**	Verken tilfreds eller utilfreds **4**	Tilfreds **5**	Meget tilfreds **6**	Svært tilfreds **7**

12. Dersom du skulle valgt om igjen; ville du da ha valgt å takke ja til denne behandlingen på nytt, med den kjennskap du nå sitter med , både med tanke på virkninger /bivirkninger av behandlingen, og sykdommens utvikling?

Nei, helt sikkert ikke valgt samme behandling igjen **1**	Mest trolig ikke valgt samme behandling igjen **2**	Neppe valgt samme behandling igjen **3**	Usikkert **4**	Kanskje valgt samme behandling igjen **5**	Mest trolig valgt samme behandling igjen **6**	Ja, ville absolutt gjort samme valg igjen **7**

13. Hvis en nær venn fikk samme sykdom som deg, ville du da ha anbefalt ham/henne å ta imot den samme behandling som du selv har mottatt?

Ja, absolutt **5**	Mest sannsynlig **4**	Usikkert **3**	Mest sannsynlig ikke **2**	Nei, overhodet ikke **1**

Appendix IVb

Patient experiences

We would like to ask you about your experiences with the hospital-division(s) during the treatment of your cancer.

Please answer according to your experiences
at diagnosis -at surgery -at radiation therapy
at chemotherapy -at follow-up with Best Supportive Care

1. Concerning the treatment you have received, what is your opinion of the hospital department? (dept. of pulmonology / Centre of radiotherapy/ Surgical dept.)

No trust **1**	Little trust **2**	Trusted **3**	Highly trusted **4**	Very highly trusted **5**

2. What is your opinion of the nursing and medical treatment you received?

Highly unsatisfying **1**	Very unsatisfying **2**	Unsatisfying **3**	Neither satisfying nor unsatisfying **4**	Satisfying **5**	Very satisfying **6**	Highly satisfying **7**

3. Concerning my possibilities to explain important matters about my lung disease, I am

Highly unsatisfied **1**	Very unsatisfied **2**	Unsatisfied **3**	Neither satisfied nor unsatisfied **4**	Satisfied **5**	Very satisfied **6**	Highly satisfied **7**

4. What is your opinion of the physicians' information to you?

Definitely very little understandable **1**	Very little understandable **2**	Little understandable **3**	Neither – nor **4**	Understandable **5**	Very well understandable **6**	Very well understandable **7**

5. Have you been told what you find necessary about examinations to be performed during the diagnostic phase?

No, I was told nothing **1**	I was told too little **2**	I was told some **3**	I was told most **4**	Yes, I was told everything I needed **5**

6. Do you feel that the physicians have cared for you?

No care **1**	Little care **2**	Some care **3**	Good care **4**	Very good care **5**

7. Do you feel that the nurses have cared for you?

No care **1**	Little care **2**	Some care **3**	Good care **4**	Very good care **5**

8. Did you experience one specific physician to be mainly in charge of you?
   Yes No

9. Did you, upon leaving the hospital, have information concerning your disease?

No, I was told nothing **1**	I received little information **2**	I received some information **3**	I received most information **4**	Yes, I was told all I needed **5**

The next questions concern treatment you have received.

10. How straining has treatment been?

Not straining at all **5**	A bit straining **4**	Rather straining **3**	Very straining **2**	Highly straining **1**

Does not apply

11. Concerning information about effects and side-effects of the treatment you have received, are you

Highly unsatisfied **1**	Very unsatisfied **2**	Unsatisfied **3**	Neither satisfied nor unsatisfied **4**	Satisfied **5**	Very satisfied **6**	Highly satisfied **7**

Does not apply

12. If you were to choose again, would you, with your present experience concerning disease development, effects and side effects, accept the same treatment again?

No, definitely not repeat **1**	Most probably not repeat **2**	Maybe not repeat **3**	Unsure **4**	Maybe repeat **5**	Most probably repeat **6**	Yes, definitely repeat **7**

13. If a close friend or relative were to get the same disease, would you recommend him the same treatment as you have received?

Yes, definitely recommend **5**	Most probably recommend **4**	Unsure **3**	Most probably not recommend **2**	No, definitely not recommend **1**

Appendix V

Spørreskjema ved diagnose

RØYKING ***fylles ut av pasienten***

1. Røyker du nå? (siste 6 måneder)

Ja	Nei
Daglig røyker	Aldri røyker (gå videre til sp.mål 9)
12.1.1.1.1.1.1 Røyker av og til (mindre enn 1sig. daglig)	Tidligere røyker

Hvis du har sluttet å røyke, hvor gammel var du da du sluttet? _ _ _ år

2. Alder ved røykestart: _ _ år

3. Hvilket sigarettmerke /tobakksmerke har du røkt mest? (Se vedlegg hvis i tvil)_____

Har du alltid røkt filtersigaretter? Ja Nei -hvis nei:

- Hvor stor andel av sigarettene du har røkt har vært hjemmerullede? _ _ _% *(eks.25%, 50% osv.)*
- Hvor stor andel av sigarettene du har røkt har vært med filter? _ _ _ %
- Hvor stor andel av tobakken du har røkt har vært pipe? _ _ _ %

4. Hvor mange sigaretter/hjemmerullede sigaretter har du gjennomsnittlig røkt per dag ?
   _ _ _ sigaretter

5. Hvor mange sigaretter/hjemmerullede sigaretter har du røkt på det meste per dag?
   _ _ _ sigaretter
6. Hvis rulletobakk eller pipe; hvor mange pakker har du gjennomsnittlig røkt per uke?
   _ _ _ pakker
7. Hvis rulletobakk eller pipe; hvor mange pakker har du på det meste røkt per uke?
   _ _ _ pakker

YRKE, SIVILSTAND

8. Hvilken skolegang har du fullført? (kryss av bare for høyeste utdanning)
   - 7-10 årig grunnskole /middelskole
   - yrkesfaglig videregående /yrkesskole /handelsskole
   - artium /allmennfaglig retning videregående skole / - økonomisk gymnas

   - fullført 1-3årig høyskole eller universitetsstudium
   - fullført utdanning ved høyskole eller universitet av - 4 års normert varighet eller mer

9. Hvilket yrke har du? (hvis flere; nevn det/de yrker du har hatt lengst) _____
(industriarbeider ≤ , kontorist primærnæring , snekker/rørlegger ≤ , annet)

10. Har du, så vidt du vet selv, vært eksponert for mulige skadelige stoffer gjennom jobben? I så fall, hva og hvor lenge?

Asbest _ _ år	Mineralstøv _ _ år

Nikkel _ _ år Annet _ _ år -Hva?_____

11. I hvilken grad er du yrkesaktiv?
I full jobb
Arbeidsledig
Sykmeldt _ _ _ % Fra dato _ . . _ _ _ til _ . . _ _ _
Ufør / på attføring
Pensjonist
Hjemmeværende

12. Hva er din sivilstatus? Gift /samboer Skilt /separert Enslig Enke /-mann

13. Røyker din partner/ livsledsager (gjelder også tidligere, langvarig livsledsager)?
Ja Nei Har ingen partner

15. I hvor mange år har du bodd sammen med andre røykere? _ _ år (Hvis uaktuelt, skriv "0")

16. Har du god kontakt med andre mennesker, et "nettverk" som du føler at du kan betro deg til / noen å snakke med om problemer? Ja Nei Usikker

ANDRE SYKDOMMER, SYMPTOMER

17. Har du fra tidligere vært syk med (kryss av):

	Ja	Nei
Astma?		
Kronisk obstruktiv lungesykdom (KOLS/emfysem/ kronisk bronkitt)?		
Hjertesykdom (infarkt, angina pectoris)?		
Høyt blodtrykk eller hjerneslag?		
Annen kreftsykdom?		
"Røykebein"		

18. Hvilke plager var det som gjorde at du gikk til lege for den sykdommen som nå er oppdaget? (kryss av for en eller flere)

Økt tungpust	Slapphet
Smerter	Hoster opp blod
Hoste	Lungebetennelse
Heshet	Krampeanfall
Vekttap	Annet
Svelgbesvær	Ingen symptomer

19. Når merket du først de plagene som du nå ser at hadde sammenheng med lungekreft-sykdommen? _ . . _ _ _ (dag/mnd/år)

20. Når kontaktet du første gang lege for den sykdommen som nå er oppdaget?
_ . . _ _ _ (dag/mnd/år)

21. Når ble du henvist videre til spesialist for utredning? _ . . _ _ _ (dag/mnd/år)

Appendix VI

Tjære og nikotin i sigaretter på det norske markedet

Filtersigaretter	**mg**	**mg**
Barclay Number One	1	0,1
Barclay Number One Mentol	1	0,1
Barclay Ultra Lights	2	0,2
Dunhill Super Lights	4	0,4
Merit Ultra Lights (blå)	4	0,4
Merit Ultra Lights Mentol	4	0,4
Merit Ultra Lights 100	5	0,4
Barclay 100 mm	5	0,5
Barclay	5	0,5
Barclay Mentol	5	0,5
Merit	7	0,5
Dunhill Lights	6	0,6
Dunhill Lights Menthol	6	0,6
Camel Extra Lights	7	0,6
Marlboro Lights	8	0,6
Cooly Light Menthol	7	0,7
Camel Lights	8	0,7
Lucky Strike Lights	8	0,7
Salem Lights Menthol	8	0,7
Winston Lights	8	0,7
Pall Mall Lights	8	0,7
Marlboro Lights 100	9	0,7
Kent	9	0,7
Winchester Lights	12	0,7
Camel Medium	10	0,8
Pall Mall Mild	11	0,8
Marlboro Medium	11	0,8
Prince Extra Mild	9	0,9
Prince Extra Mild 100	9	0,9
Petterøe Extra Mild KS Filter	9	0,9
Dunhill Menthol	11	0,9
Winston Lights 100	11	0,9
Petterøe's Mild KS Filter	11	0,9
Biltmore Light	11	0,9
Mento	11	0,9
Benson & Hedges	12	0,9
Dunhill Filter	12	0,9
Rothmans Filter	12	0,9
Lucky Strike	12	0,9
South State KS	13	0,9

Marlboro	13	0,9
Marlboro 100	13	0,9
Prince Mild	12	1,0
Prince Mild 100	12	1,0
Prince Mild Menthol	12	1,0
Cooly Menthol	13	1,0
Pall Mall Mild	13	1,0
Pall Mall Filter	14	1,0
More Grønn Menthol	14	1,0
More Rød	14	1,0
Winchester	15	1,0
Blue Master	14	1,1
Petterøe's KS Filter	14	1,1
Winston Filters 100	15	1,1
Winston Filters	15	1,2
Craven «A» Filter	15	1,2
Camel Filters	15	1,2
Salem Filter Menthol	15	1,2
Prince	14	1,3
Prince 100	14	1,3
Tiedemanns Rød	15	1,5
Uten filter	**mg**	**mg**
Camel	15	1,2
Craven A Plain Tip	15	1,2
Pall Mall	15	1,2
South State KS	15	1,3
Teddy	15	1,3

Innhold av nikotin, tjære og karbonmonoksyd i håndrullede sigaretter

(Alle data pr. sigarett/i mg per sigarett)

Petterøe's 3 Blanding	Håndrullet	2,67	34,21	21,97
Petterøe's 3 Mild	Håndrullet	1,99	32,68	22,10
Petterøe's 3 Extra mild	Håndrullet	1,92	31,56	21,55
Eventyr 3 Blanding	Håndrullet	2,68	35,93	22,81
Eventyr 3 Mild	Håndrullet	2,48	35,49	22,20
Gull Snitt	Håndrullet	3,02	34,67	22,13

Petterøe's 3 Blanding	Hylse m/filter	1,88	21,50	18,94
Petterøe's 3 Mild	Hylse m/filter	1,28	20,36	19,05
Petterøe's 3 Extra mild	Hylse m/filter	1,25	20,05	19,05
Teddy		1,40	22,00	13,00

Kilde: Målingene av nikotin, tjære og karbonmonoksyd i rulletobakken er foretatt av Chemisches Laboratorium Dr. L. Herzfeld AG, Basel i januar 1994.
Tabeller og diagram er utarbeidet av Statens tobakksskaderåd. Mars 1999 .