ANCR & NCU SYMPOSIUM 2017

Stavanger, Norway
29.–31. August 2017

TUESDAY 29 AUGUST – PRESYMPOSIUM

12:00–17:00	ANCR BOARD MEETING
16:00–18:00	NCU BOARD MEETING
13:30–14:00	Registration and refreshments
14:00–17:00	Pre-symposium workshop I: Current challenges in coding and registration of cancer. Tom Børge Johannesen
14:00–17:00	Pre-symposium workshop II: Missing data and the estimation of cancer survival. Ula Nor
18:00	Barbeque party on the beach, with games and evening swim

WEDNESDAY 30 AUGUST

07:00–09:00	Morning swim and breakfast
09:00–09:10	Giske Ursin: Opening
09:15–09:40	Freddie Bray: Challenges in cancer registration in the 21st century.

Session 1: Patients pathways and survival (Chair: Giske Ursin)

09:45–09:55	<u>Anna L. V. Johansson (SE):</u> Pregnancy-associated breast cancer (PABC); no evidence of patients' or doctors' delays
10:00–10:10	<u>Ina Tapager (DK):</u> The Danish lung cancer patient pathway – who's in and who's out?
10:15–10:25	<u>Laufey Tryggvadóttir (IS):</u> Oestrogen receptor status, treatment and breast cancer prognosis in Icelandic *BRCA2* mutation carriers
10:30–10:55	Coffee break
11:00–11:10	<u>Janne Pitkäniemi (FI):</u> Regional variation in cancer survival in Finland in 1960–2014
11:15–11:25	<u>Linn M. Åsli (NO):</u> Variation in the use of palliative radiotherapy in Norway

Session 2: Registration (Chair: Laufey Tryggvadóttir)

11:30–11:40	<u>Jane Christensen (DK):</u> Completeness of The Danish Cancer Register and The Danish Colorectal Cancer Group database
11:45–11:55	<u>Mats Lambe (SE):</u> Assessment and trace back of lung cancer DCOs in Sweden
12:00–12:10	<u>Maarit K. Leinonen (NO):</u> Data quality of surgical procedures for cervical premalignant lesions in the Cancer Registry of Norway in 1998–2013
12:15–12:25	<u>Gerda Engholm (DK):</u> Registration of TNM-stage in the Nordic countries
12:30–13:25	Lunch
12:30–13:25	JOINT BOARD MEETING ANCR & NCU

13:30–14:25   Poster sessions

Chaired poster tour 1: Screening (Chair: Ameli Tropé)

1. Petra Makkonen (FI): Attitudes and perceptions on the cervical cancer screening program and opportunistic Pap testing among healthcare providers in Finland

2. Maiju Pankakoski (FI): Inviting women to cervical cancer screening at the age of 65

3. Kirsti V. Hjerkind (NO): Associations between volumetric mammographic density and breast cancer risk factors in the Norwegian breast cancer screening program

4. Sirpa Heinävaara (FI): Invasive breast cancers by detection mode among 50–69 year old women within an organized mammography screening: a twenty-year follow up study

5. Suvi Mäklin (FI): The hospital resource in the Finnish colorectal cancer screening study

6. Sameer Bhargava (NO): Participation in the NBCSP among immigrants from Africa

7. Tytti Sarkeala (FI): New strategy for colorectal cancer screening in Finland

Chaired poster tour 2: Etiology and epidemiology (Chair: Elisabete Weiderpass)

1. Elisabete Weiderpass (NO): Menopausal hormone therapy and risk of melanoma: do estrogens and progestins have a different role?

2. Elisabete Weiderpass (NO): Menopausal hormone therapy and colorectal cancer: a linkage between nationwide registries in Norway

3. Niklas Gunnarsson (SE): No increased prevalence of malignancies among first-degree relatives of 800 patients with chronic myeloid leukemia – a population-based study in Sweden

4. Tiina Hakanen (FI): Longitudinal physical activity and breast cancer risk

5. Marte M. Reigstad (NO): Literature review on cancer risk in children born after fertility treatment

6. Merete Ellingjord-Dale (NO): Number of risky lifestyle behaviors and breast cancer subtypes in a large nested case-control study from Norway

7. Madleen Orumaa (NO): Trends in incidence, mortality and survival of invasive penile squamous cell cancer in Norway 1956–2015

8. Cassie Trewin (NO): Educational differences in survival of women diagnosed with breast cancer before age 50. Norway, 1990–2013

Chaired poster tour 3: Other topics (Chair: Espen Enerly)

1. <u>Espen Enerly (NO):</u> Resource use patterns and healthcare costs in patients with EGFR Mutation-Positive locally advanced or metastatic NSCLC in a real world setting – a nationwide cohort study

2. <u>Tor Åge Myklebust (NO):</u> A bias-variance efficient method for estimating net survival

3. <u>Nea Malila (FI):</u> Childhood cancer mortality influenced by parental socioeconomic background

4. <u>Niels Christensen (DK):</u> Algorithm for TNM stage coding

5. <u>Inger Kristin Larsen (NO):</u> Stage-specific incidence and survival of breast cancer in Norway: the implications of changes in coding and classification practice

6. <u>Liv Marit Dørum (NO):</u> Data quality at the Cancer Registry of Norway: An evaluation of the validity and completeness of the clinical registry for colorectal cancer

7. <u>Matti Rantanen (FI):</u> Defining cohort follow-up for standardized cancer incidence ratio

8. <u>Mats Lambe (SE):</u> The role of comorbidity in the management and prognosis in Non-Small Cell Lung Cancer: a population-based study

9. <u>Caroline E. Weibull (SE):</u> Assessment of unmet medical needs in the management of Hodgkin lymphoma with special focus on the elderly – A population-based study of patients diagnosed in Sweden 1973–2014

10. <u>Anna Plym (SE):</u> Loss in working years after a breast cancer diagnosis

11. <u>Thererse M. L. Andersson (Swe/Den):</u> Avoidable cancer cases in the Nordic countries – the impact of alcohol consumption

12. <u>Christiane Rudolph (Ger):</u> Cross-border documentation and analyses of quality of cancer care in Germany and Denmark within the project Innovative High Technology Cancer Treatment Denmark-Germany (InnoCan)

Session 3: Screening (Chair: Nea Malila)

14:30–14:40   <u>Deependra Singh (FI):</u> Breast symptoms and the risk of subsequent interval cancers and lethal breast cancers

14:45–14:55   <u>Espen Enerly (NO):</u> Prevalence of human papillomavirus in mouth and vagina among adolescents after introduction of school-based HPV-vaccination in Norway

15:00–15:15   Coffee break

15:15–15:25	Maija Jäntti (FI): The effect of colorectal cancer screening on self-perceived health and lifestyle
15:30–15:40	Kirsi Talala (FI): Long-term health-related quality of life in the Finnish randomized study of screening for prostate cancer
15:45–15:55	Veli-Matti Partanen (FI): Nordscreen – an interactive tool for presenting cervical cancer screening indicators in Nordic countries
16:00–16:10	Sameer Bhargava (NO): 20 years with organised mammographic screening in Norway; high attendance rates, but no information about immigrants
16:15–16:25	Ameli Tropé (NO): High-risk human papillomavirus screening roll-out in Norway
18:00	Conference dinner with guided tour

THURSDAY 31 AUGUST

07:00-09:00	Morning swim and breakfast

Session 4: Clinical registries (Chair: David Pettersson)

09:00–09:20	Jens Winther Jensen (DK):
09:25–09:35	Helgi Birgisson (IS): Complications after colorectal cancer surgery, comparison of Icelandic clinical data to data from the regional clinical quality register for colorectal cancer in Uppsala-Örebro region
09:40–09:50	Hrefna Stefánsdóttir (IS): Ductal carcinoma in situ, comparison of diagnosis and treatment in Iceland with Uppsala-Örebro region Sweden
09:55–10:05	Ylva M. Gjelsvik (NO): Prostate cancer outcomes – Norwegian patient reported outcomes national initiative. Logistics and infrastructure of a national, prospective collection of patient reported outcome measure (PROMs)
10:05–10:15	Discussion

Session 5: Etiology (Chair: Hans Storm)

10:15–10:25   <u>Jonine Figueroa (Sco):</u> Assessment of temporal trends of breast cancer incidence by estrogen receptor status in Scotland, UK

10:30–11:00   Coffee break

11:00–11:10   <u>Hilde Langseth (NO):</u> Cancer incidence in the Janus Agricultural Cohort in Norway (JAC) – a register-based study

11:15–11:25   <u>Jo S. Stenehjem (NO):</u> Measured anthropometric factors and cutaneous melanoma risk: Data from the population-based Janus cohort

11:30–11:40   <u>Frida E. Lundberg (SE):</u> Assisted reproductive technology and risk of borderline and invasive ovarian tumors in parous Swedish women

11:45–11:55   <u>Marte M. Reigstad (NO):</u> Cancer risk in women treated with fertility drugs according to parity status – A registry-based cohort study

12:00–12:10   <u>Sanna Heikkinen (FI):</u> Non-smoking, alcohol free or normal weight Finland by 2024 – new cancers 2034

12:15–12:25   <u>Bettina K. Andreassen (NO):</u> Bladder cancer epidemiology research based on data from the Cancer Registry of Norway

12:30   Farewell lunch

ANCR
Association of the Nordic Cancer Registries

Abstracts

Avoidable cancer cases in the Nordic countries – the impact of alcohol consumption

<u>Therese M-L Andersson</u>[a,b]; Gerda Engholm[c]; Eero Pukkala[d,e]; Magnus Stenbeck[f]; Hans Storm[b]; Laufey Tryggvadottir[g]; Elisabete Weiderpass[a,h,i,j]

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There is a strong scientific consensus of an association between alcohol drinking and the risk of cancers of the mouth, pharynx, larynx, liver, breast and colorectum as well as oesophageal squamous cell carcinoma. With high alcohol consumption in the Nordic countries, the potential for cancer prevention by reduction in alcohol consumption is of interest. The population-attributable fraction is often used to quantify the total effect of an exposure on disease burden. However, complete removal of alcohol drinking is unrealistic and an evaluation of different levels of alcohol consumption is of far more use from a public health perspective.

We will present the number of avoidable cancer cases in a 30-year period (2016-2045), in the Nordic countries, under different alternative scenarios of alcohol consumption. This is estimated using the Prevent macro-simulation model for the cancer sites listed above. The results from this study can be used to understand the potential impact and significance of primary prevention programs targeted towards reducing the alcohol consumption in the Nordic countries.

This work is performed as a Nordic collaborative project with the aim to quantify the proportion of the current cancer burden in the Nordic countries linked not only to alcohol but also to overweight, tobacco smoking, and low physical activity, and how the cancer burden would change under different prevalence levels for these risk factors.

20 years with organised mammographic screening in Norway; high attendance rates, but no information about immigrants

Bhargava, S., Tsuruda, K., Hofvind, S.

Institution: Cancer Registry of Norway

Aim

Examine mammographic screening attendance rates among immigrants in Norway compared to non-immigrants.

Material and Methods

We examined whether immigrant and non-immigrant women had ever attended the Norwegian Breast Cancer Screening program by merging data from the Cancer Registry of Norway with data on socioeconomic factors and birth country from Statistics Norway. We calculated percent attendance and incidence rate ratios (IRR) comparing immigrants to non-immigrants.

Results

A total of for 885,979 women were included in the analyses. Fewer immigrants than non-immigrants had ever attended the screening program (IRR 0.77). The difference was less pronounced when adjusted for socioeconomic factors (IRR 0.89). Attendance rates varied between immigrant groups, with the lowest adjusted IRR seen among women born in the Baltic countries (0.62) and Eastern Africa (0.65). Immigrants from the other Nordic countries, the British Isles and Oceania had similar attendance as non-immigrants, as shown by adjusted IRR. Attendance rates increased with duration of residency in Norway.

Conclusion

Immigrant women had lower attendance rates than non-immigrants, which may result in later stage diagnosis. The birth countries of women with the lowest attendance rates differ in many aspects, including with respect to UN development status, UN income category, continent, history, culture, language(s) and main religion(s). It is thus likely that immigrant women from different countries differ in their rationales for non-attendance.

Participation in the NBCSP among immigrants from Africa

Bhargava, S., Hofvind, S.

Institution: Cancer Registry of Norway

Aim

We examined mammographic screening attendance in the Norwegian Breast Cancer Screening Programme among immigrants from different parts of Africa.

Material and methods

We merged data about birth country and socioeconomic factors from Statistics Norway with screening data from the Cancer Registry of Norway for 3938 African immigrants divided into 5 geographical regions and 813,772 non-immigrants. We calculated percent attendance and incidence rate ratios (IRR) comparing immigrants to non-immigrants.

Results

Women born in all five regions of Africa had lower attendance rates than non-immigrants, but rates varied between the regions. The lowest IRR adjusted for socioeconomic factors were seen among women from Eastern Africa (0.65), while women from Southern and Western Africa had the highest adjusted IRR (0.87). Seven countries were the birthplace of at least 100 women in our study (Eritrea, Ethiopia, Ghana, Kenya, Morocco, Somalia and South Africa). Only 27% of women born in Somalia had ever attended, which was far fewer than for women born in other countries in Eastern Africa and other countries in the rest of Africa.

Conclusion

Immigrants from Africa had lower attendance rates than non-immigrants, but there was substantial variation between women from different regions and countries. Combining results for women from Africa into a single unit may be necessary in order to obtain sufficient statistical power, but this comes at the cost of diversity.

Complications after colorectal cancer surgery, comparison of Icelandic clinical data to data from the regional clinical quality register for colorectal cancer in Uppsala-Örebro region

Einar Bragi Árnason[1,2], Tryggvi B. Stefánsson[2], Laufey Tryggvadóttir[1,3], Páll Helgi Möller[2,3],Fredrik Sandin[4], Mats Lambe[4,5], <u>Helgi Birgisson</u>[1,6]

[1]*Icelandic Cancer Registry;* [2]*Department of Surgery, Icelandic University Hospital ;* [3]*Faculty of Medicine University of Iceland;* [4]*Regional Cancer Center Uppsala-Örebro, Sweden;* [5]*Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Sweden. ;* [6]*Department of Surgical Sciences, Uppsala University, Sweden*

Aim

To evaluate the treatment and complications after colorectal surgery in patients diagnosed in Iceland compared with hospitals in the Uppsala-Örebro region in Sweden (UÖR).

Materials and methods

The study included all patients who were diagnosed with colon or rectal cancer 2014 and 2015. Information on complications were obtained from surgical record system and the registration forms were based on the Swedish INCA forms.

Results

There were 345 cases from Iceland and 2767 cases from UÖR. Complications were more common in Iceland in the case of colon cancer for elective surgeries both years and for acute surgeries in 2014 (p<0.001; elective surgery 2014, p<0.001; elective surgery 2015 and p=0.004; acute surgery 2014). There was significant difference in complications for rectal cancer in 2014 compared to UÖR where complications were more common in Iceland (p<0.001). There was no significant difference in the rate of anastomotic leakage except for rectal cancers in 2014 where anastomotic leakage was more common in Iceland (p=0.002). No significant difference was found in the rate of re-admissions, reoperations or mortality within 30 days of surgery.

Conclusion

Complications in Iceland were high compared to UÖR and other studies. Anastomotic leakage, re-admissions, reoperations and mortality rates were however comparable to UÖR. This study shows that comparison with Sweden is useful but the registration was retrospective and there were difficulties accessing information in the medical records. That shows the importance of establishing a quality registration were information is prospectively registered.

Completeness of The Danish Cancer Register and The Danish Colorectal Cancer Group database

Christensen J[1], Schmidt LKH[2], Kejs AMT[1], Søgaard J[1], Rasted MC[2], Andersen O1, Ingeholm P[3], Iversen LH[4]

[1]*Documentation and Quality, The Danish Cancer Society;* [2]*Data Quality and Documentation, The Danish Health Data Authority;* [3]*Department of Pathology, Herlev University Hospital, Chairman of The Danish Colorectal Cancer Group Database;* [4]*Department of Surgery, Aarhus University Hospital*

Background

In 2014, The Danish Cancer Register(DCR) reported 5,368 new cases of colorectal cancer. In the same year, The Danish Colorectal Cancer Group(DCCG) reported 5,188 new cases of colorectal cancer. There is thus a discrepancy between these two country-wide population-based registers. However, the two databases do not use identical inclusion criteria. The possible consequences of this difference on estimation of survival rates has not previously been qualified or quantified.

Methods

Descriptive statistics has been used for the comparison of data from DCR and DCCG. The inclusion criteria from DCCG has been applied to DCR. For the same period 1-year relative survival(RS) and Cox proportional hazard rates has been calculated.

Results

In the period 2013-2014 DCR registered 8,743 patients and DCCG registered 9,330 patients. In total, 9,712 patients were diagnosed with colorectal cancer when combining the two registries. Of these 86% were included in both registers, while 4% were only included in DCR and 10% were only included in DCCG. A small difference is seen in RS between the two registries, DCR 86% (95%CI 85-87) and DCCG 85% (95%CI 84-85). When using a Cox Proportional Hazard model we found for DCCG a HR 1.09 (95%CI 1.01-1.17) for death compared to DCR.

Details about patients only included in one registry will be presented.

Conclusion

After using the same inclusion criteria of DCCG on data from DCR we still found discrepancies between the two registers. We found a significant difference between the two registries when using a Cox Proportional Hazard model.

Algorithm for TNM stage coding

Christensen, Niels[1]; Søren Friis[2]

Danish Cancer Society
[1]Documentation & Quality; [2]Danish Cancer Society Research Center

Background

The TNM classification of staging was introduced in the 1950's. The TNM classification has a key role in the planning of treatment and monitoring of cancer. The development of the classification and its increasing use in the management of cancer disease has spurred interest in automatic computing of clinical stage on basis of TNM in the registration of cancer.

Aim

The aim of this study is to develop an algorithm for computing a stage code for all malignant neoplasms included in the TNM Classification.

Methods

The algorithm computes a stage code if the registered T, N and M codes are valid for the actual site and edition of the TNM manual. The algorithm generates an array of different types of "missing values". Various methods to reduce the number of missing values have been proposed, achieving different levels of completeness.

We have developed an algorithm that can be adopted according to the actual edition of TNM and allowing incorporation of different methods of reducing missing values. This gives the individual user the possibility to choose an option that fits with the given purpose and to analyze the effect of choosing various methods.

Conclusion

The algorithm will improve the coding of cancer stage coding in terms of both resources and consistency.

Data quality at the Cancer Registry of Norway: An evaluation of the validity and completeness of the Clinical Registry for Colorectal Cancer

Liv Marit Dørum[1], Inger Kristin Larsen[1], Kristin Oterholt Knudsen[1], Barthold Vonen[2], Bjørn Møller[1].

[1]Cancer Registry of Norway; [2]Center for clinical documentation and evaluation, Helse Nord RHF, UiT The Arctic University of Norway.

Aim

The aim of the project was to evaluate the data quality in the national clinical register for colorectal cancer.

Material and methods

The study evaluated the validity and completeness of diagnostics, treatment and follow-up for rectal cancer patients who had received surgery between 2001 and 2006 (n=1410), by reabstracting information from the medical records. Ten hospitals were included in the study.
The quality was evaluated using Kappa statistics, and categorized from poor to very good agreement.

Results

In general, the agreement was moderate for information obtained from one source only. Information generated from multiple sources had good to very good agreement. This high correspondence might be a result of the information being double-checked in the registration process against multiple sources. Information about treatment had an agreement from moderate to very good. The agreement for information on follow-up was categorized as good for local recurrence and very good for metastatic disease.
The data completeness in the clinical registry for local recurrence and metastatic disease were 98.2% and 96.6% respectively.

Conclusion

The majority of the parameters in the clinical registry for colorectal cancer have a high correspondence, categorized as good to very good agreement.

Number of risky lifestyle behaviors and breast cancer subtypes in a large nested case-control study from Norway

Merete Ellingjord-Dale[1], Linda Vos[1], Steinar Tretli[1], Solveig Hofvind[1], Anette Hjartåker[3], Hege Russnes[5], Isabel dos-Santos-Silva[2], Giske Ursin[1,3,4]

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Background

It is unclear how alcohol, smoking, physical inactivity, high body mass index (BMI) and menopausal hormone therapy combined influence overall breast cancer risk, and whether they are associated with only certain subtypes.

Methods

We conducted a case-control study nested within a cohort of 344,348 women who participated in the Norwegian Breast Cancer Screening Program in 2006-2014. We had 4 686 breast cancer cases and 32 355 controls with information on risk factors and hormone receptor status (i.e. estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor 2 (HER2). We defined breast cancer subtypes as follows: ER+PR+HER2- ("luminal A-like"), ER+PR-HER2- ("luminal B-like HER2 negative"), ER+ PR+/PR-HER2+ ("luminal B-like HER2 positive"), ER-PR-HER2+ ("HER2 positive") and ER-PR-HER2- ("triple negative"). Risky lifestyle behaviors were ever smoking, weekly consumption of more than 3 glasses of alcoholic beverage, less than 4 hours leisure time physical activity per week, ever use of menopausal hormone therapy and BMI ≥25 (kg/m²). We used conditional logistic regression to estimate odds ratios (ORs), with 95% confidence intervals (CIs), adjusted for potential confounders.

Results

Number of risky lifestyle behaviors was associated with an increased risk of breast cancer overall (OR per risky lifestyle behavior=1.12). The highest breast cancer risk was observed for luminal A-like breast cancer with an increase of 18% per risky lifestyle behavior. Number of risky lifestyle behaviors was not associated with triple negative breast cancer (p-trend= 0.27).

Conclusion

Number of risky lifestyle behaviors was positively associated with breast cancer overall and a marked increased risk for luminal A-like breast cancer.

Prevalence of human papillomavirus in mouth and vagina among adolescents after introduction of school-based hpv-vaccination in Norway

E. Enerly[1], R. Flingtorp[1], I. K. Christiansen[2], S. Campbell1, M. Hansen[2], E. Weiderpass 1, M. Nygård[1]

[1]Cancer Registry of Norway, Research department, Oslo, Norway; [2]Department of Microbiology and Infection Control, National HPV Reference Laboratory, Akershus University Hospital, Lørenskog, Norway

Aim

The objective of the study is to assess the effect of school-based HPV-vaccination by comparing type-specific HPV prevalence between vaccinated and non-vaccinated women of the first cohort offered vaccination in Norway.

Materials and methods

316 women born in 1997 have been recruited through Facebook advertisement. They have provided self-samples collected from the vagina, using Evalyn Brush®, Rovers, and from the mouth using FLOQSwab™, COPAN. All samples will be HPV-typed using modified general primers (MGP)-PCR followed by hybridization of type-specific oligonucleotide probes (Luminex technology), detecting and genotyping 37 HPV types. Sexual habits are ascertained through a short questionnaire and linkage to the Norwegian Immunization Registry (SYSVAK) will allow us to validate their vaccination status.

Results

The Facebook ads received ~7000 link click based on >2 million ad exposures. Recruiting un-vaccinated was less effective than recruiting vaccinated. DNA extraction and HPV-typing for detecting differences in vaginal and oral HPV-prevalence among the HPV vaccinated and non-vaccinated women are ongoing and will be presented.

Conclusions

Oral and vaginal HPV prevalence in women in the first cohort receiving school-based HPV-vaccination in Norway will be presented. Methodologically the recruiting using Facebook advertisement is effective although the unvaccinated are hard to recruit.

Resource use patterns and healthcare costs in Patients with EGFRm+ Locally Advanced or Metastatic NSCLC in a Real World Setting - a nationwide cohort study

E. Enerly[1], P. Hasvold[2], T. Å. Myklebust[1,3], M. Ekman[4], T. B. Johannesen[1], T. Hallerbäck[4], Å. Helland [5,6]

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Aim

Tyrosine kinase inhibitors (TKI) are the first treatment line of locally advanced or metastatic non-small cell lung cancer (NSCLC) with confirmed mutation positive epidermal growth-factor receptor (EGFRm+). We aim to present the rationale and a study design for investigating the real-life cost and resource use for this treatment, compared to a non-EGFR TKI based treatment regimen in NSCLC.

Materials and methods

This descriptive study will include patients registered in the Cancer Registry of Norway, with locally advanced or metastatic NSCLC diagnosed from 2010-2015. Data on disease characteristics, EGFR testing patterns, and treatments patterns will be obtained from the Cancer Registry, while medical history, resource use patterns, and healthcare costs (diagnosis-related group [DRG]) will be obtained by linkage to the Norwegian Patient Registry (NPR), and the Norwegian Prescription Database (NorPD). Date and cause of death will be collected from the Norwegian Cause of Death Registry (CDR).

Results

The study will investigate: (1) Use and results of EGFR testing for locally advanced and metastatic NSCLC patients; (2) EGFR TKI treatment patterns for EGFRm+ NSCLC; (3) Resource use patterns and healthcare costs of EGFR-TKI-treatment compared to a non-EGFR TKI based treatment regimen; and (4) Regional differences in EGFR testing patterns and EGFR TKI treatment. Variables and data sources allowing for a comparison of resource use patterns and healthcare costs in patients with EGFRm+ locally advanced or metastatic NSCLC in a real-life treatment setting will be discussed.

Conclusions

The present study aims to provide valuable insights into the EGFR testing patterns, the use of EGFR TKIs, as well as resource use patterns and healthcare costs of EGFR-TKI treatment in Norwegian patients with EGFRm+ NSCLC compared to non-EGFR TKI based treatment regimens, and will give valuable insights into this treatment modality.

Registration of TNM-stage in the Nordic countries

Gerda Engholm and the NORDCAN group

Institution: Department of Documentation & Quality, Danish Cancer Society

Aim

Tumour size, Node involvement and Metastatic spread at cancer diagnosis and reported as TNM according to UICC-classification are very important registrations when deciding on treatment at MDT-conferences and for prognosis. Comparable data between the Nordic countries as less detailed TNM-stage are essential in monitoring the variation in cancer survival and the causes behind. We want to collect, validate and compare TNM-stage distributions of existing TNM-data in the registers and compare stage-specific survival.

Material and Methods

In the NORDCAN 2014-update process, the Nordic cancer registries have delivered available TNM-data along with the incidence and mortality data. For each site TNM registrations are transformed to TNM-stage in four categories plus different missing categories due to the varying quality of the registrations.

Results

In Denmark and Sweden TNM have been registered from 2004 for many solid tumours, but mostly without information if clinical or postsurgical. Many clinicians report MX, missing – because "you cannot be sure" while MX is not a valid value in the latest UICC version. Norway and Iceland collect both clinical and postsurgical TNM for some cancer sites from later years from clinical registers and Finland get some TNM-registrations but not systematically.

Conclusion

Overview of the available TNM-data will be shown along with examples of stage-distribution and stage-specific survival by country, sex age and year of diagnosis.
More systematic registration of TNM should be supported.

Assessment of temporal trends of breast cancer incidence by estrogen receptor status in Scotland, UK

Jonine Figueroa[1], William Anderson[2], Phil Rosenberg[2], Mor Kandlik Eltanani[3], Andrew Deas[3], Sarah Wild[1]

[1]Usher Institute of Population Health Science and Informatics, University of Edinburgh, Edinburgh, UK; [2]Division of Cancer Epidemiology and Genetics, National Cancer Institute, Bethesda, MD, USA; [3]Scottish Cancer Registry, NHS National Services Scotland, Edinburgh, UK

Aim

Estrogen receptor (ER) expression is a marker of etiologic heterogeneity in breast cancer. We aimed to assess whether trends in breast cancer incidence from 1997-2014 vary by ER status using data from the Scottish Cancer Registry.

Material and methods

From 1997-2014, we received anonymized data on 73,827 cases registered in Scotland. We calculated age-standardized incidence rate trends (ASR) by ER positive and ER negative status (corrected for ER unknowns). The overall linear trends by ER were summarized with the estimated annual percentage change of the ASR, calculated using a weighted log-linear regression assuming an underlying Poisson distribution as previously described (Anderson 2011 and 2013).

Results

Compared to ER-positive breast cancers (N=56,161), ER-negative breast cancers (N = 11,863) are significantly more likely to be diagnosed in premenopausal women (26% vs 18%), to be larger in size (>2.0cm, 43% vs 32%), more poorly differentiated (70% vs 26%), and node positive (35% vs 31%). In Scotland, ER-positive breast cancers are increasing at a rate of 1.4% per year (95% confidence intervals, CI, 1.1 to 1.7%) while ER-negative breast cancers are decreasing at a rate of -1.8% per year (95% CI, -2.6 to -0.9% per year).

Conclusion

Consistent with Data in the US and Denmark, ER positive breast cancers are rising while ER negative breast cancers are declining. Future work using tumour tissue from repositories to perform more modern molecular profiling of breast tumours, linked to cancer registries could provide further insights etiology and trends in incidence of molecular subtypes beyond ER.

Prostate cancer outcomes – Norwegian patient reported outcomes national initiative. Logistics and infrastructure of a national, prospective collection of patient reported outcome measures (PROMs)

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Aim
To provide preliminary information on the feasibility and infrastructure of a nationwide, prospective controlled survey regarding patient reported outcome measures (PROMs) among recently diagnosed prostate cancer patients.

Material and methods
After extensive discussions with the reference group for the Norwegian Prostate Cancer Registry (NoPCR) and the Project Steering Group, the Cancer Registry of Norway (CRN) started a nationwide, prospective survey in 2017. All new prostate cancer (PCa) patients, as well as an age-matched group of controls, are invited to participate in a health survey (PROMs) shortly after PCa diagnosis (baseline), and after 1 and 3 years. Invitees with a digital mailbox are invited electronically, and others via regular mail. Participants choose whether to respond electronically or on paper. At the CRN, paper questionnaires are scanned and converted using optical character recognition. The PROMs data are linked with data in the NoPCR at the CRN, and eventually other public registries.

Results
The initial response rate is around 35 % after six weeks of PROMs collection. Details of the infrastructure as well as updated results regarding response rates will be presented. We will also describe comments and questions from invitees and others.

Conclusion
The infrastructure for sending out and receiving PROMs questionnaires is feasible on a nationwide level. Initial response rates are as expected, and questionnaires well received.
The study is financially supported by the Movember Foundation.

No increased prevalence of malignancies among first-degree relatives of 800 patients with chronic myeloid leukemia - a population-based study in Sweden

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Contribution:

A.S., M.H., L.S. and J.R. provided conception and design, patient material, data collection, data interpretation, and manuscript writing. N.G. provided conception and design, data collection, data interpretation, and manuscript writing. F.S provided data analysis and interpretation, statistical methodology and manuscript writing. M.B., A.D., M.L., B.M, U.O-S. and H.W. provided patient material, data collection, and manuscript writing. All authors contributed with critical revision of the manuscript.

Conflict of interest disclosure:

F.S has a consulting role for Biogen. J.R has received honoraria from ARIAD, Bristol-Myers Squibb, Novartis and Pfizer and received research founding from Bristol-Myers Squibb and Novartis. M.B has received research founding from Adolf H Lundin Charitable Foundation. M.H has a consulting role for Akinion Pharmaceuticals and Janssen-Cilag. M.L have stock ownership in AstraZeneca and Pfizer. U.O-S received research founding and honoraria from Bristol-Myers Squibb. The remaining authors declare no competing financial interests.

Aim

Examine the prevalence of malignancies among first-degree relatives (FDR) of a large and well-defined contemporary CML cohort in Sweden.

Material and methods

To identify patients with CML diagnosed between 2002 and 2013, we used the Swedish CML Register to which virtually all Swedish CML patients diagnosed January 1st 2002 and later are reported.

Each CML patient was matched with five, age-, sex- and county of residence-matched controls, randomly selected from the Swedish Total Population Register.

FDR were identified by use of the Swedish Multi-Generation Register.

By linkage to the Swedish Cancer Register, information about malignancies diagnosed later than 1958 were retrieved.

To calculate odds ratio (OR) and 95% confidence intervals (CI), conditional logistic regression was used.

Results

We identified 800 CML patients and their 4,287 FDR (parents: 1,346, siblings: 1 497 and children: 1,444), versus 20,930 FDR for the matched controls.

In total, 611 malignancies were identified among the FDR of CML patients compared to 2,844 in the control group, yielding an OR of 1.06 (95% CI 0.96 – 1.16).

Neither hematological malignancies nor solid tumors were increased in the CML-FDR group (Table 1).

Notably, none of the FDRs in the CML-FDR group had a CML diagnosis.

Conclusion

No evidence of familial aggregation of malignancies (including CML) of patients with CML were found, this suggest that a hereditary predisposition to develop cancer is unlikely to be a part of the pathogenesis of CML.

Table I. Odds ratio for malignancies among first-degree relatives of chronic myeloid leukemia patients

Outcome in relatives	CML, n = 4287	Controls, n = 20930	OR	95% CI
Myeloid				
AML	3	12	1.22	0.34 – 4.33
MDS	0	15	-	-
AML/MDS	3	26	0.54	0.17 – 1.86
CML	0	4	-	-
MPN	6	19	1.54	0.62 – 3.87
Any myeloid malignancy	8	46	0.85	0.40 – 1.80
Lymphoid				
NHL	12	64	0.92	0.49 – 1.70
HL	1	12	0.41	0.05 – 3.13
CLL	8	29	1.35	0.62 – 2.95
WM	0	0	-	-
MM	6	26	1.13	0.46 – 2.74
ALL	0	10	-	-
Any lymphoproliferative malignancy	32	163	0.96	0.66 – 1.40
Any hematologic malignancy	42	211	0.97	0.70 – 1.36
Solid Malignancies				
Gynecological (females only)	134	617	1.56	0.87 – 1.28
Gastrointestinal	125	519	1.18	0.97 – 1.44
Breast (females only)	97	398	1.19	0.95 – 1.49
Breast (males only)	0	2	-	-
Prostate (males only)	76	393	0.95	0.74 – 1.22
Urinary tract	36	211	0.83	0.58 – 1.19
Lung	32	175	0.89	0.61 – 1.30
Endocrine	29	149	0.95	0.64 – 1.42
Malignant melanoma	27	150	0.88	0.58 – 1.32
CNS	26	94	1.35	0.88 – 2.09
ENT	19	81	1.15	0.70 – 1.89
Any solid malignancy	578	2673	1.06	0.97 – 1.17
Any malignancy	611	2844	1.06	0.96 – 1.16

Abbreviations: ALL, acute lymphoblastic leukemia; AML, acute myeloid leukemia; CI, confidence interval; CLL, chronic lymphocytic leukemia; CML, chronic myeloid leukemia; CNS, central nervous system, ENT, ear-nose-throat; HL, Hodgkin lymphoma; MDS, myelodysplastic syndrome; MM, multiple myeloma; MPN, myeloproliferative neoplasms; NHL, non-Hodgkin lymphoma; OR, odds ratio; WM, Waldenström macroglobulinemia.

Longitudinal physical activity and breast cancer risk

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Aim

The aim of this study is to find out how regular physical activity over adulthood and accumulated physical activity affects breast cancer risk.

Material and methods

The study material is based on a systematic representative sample from KETTU-study, which has started in the year 1980. A self-administered questionnaire includes questions about health behavior, living habits and socioeconomic background factors. In the year 1980 surveys were send to 6,787 northeastern Finns between the ages of 19 and 63 years. The respondents of the surveys baseline questionnaires were 5,259. Follow-up questionnaires, with similar questions, were sent in the year 1981 (n=4,602), 1985 (n=4,333), 1990 (n=4,267) and 2001 (n=2,920). The study cohort was followed until the end of year 2015. Breast cancer cases were identified by the Finnish Cancer Registry.

The Cox proportional hazards regression model were used to estimate how longitudinal physical activity is associated with breast cancer.

Results and conclusion will be introduced at the conference.

Non-smoking, alcohol free or normal weight Finland by 2024– new cancers 2034

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Aim

We predicted the number of avoidable incident cancers for female breast, prostate, lung and colorectal cancers in Finland by 2034.

Material and methods

Age adjusted incidence and the number of incident cancers were predicted for period 2015-2034 by four scenarios depending on changes in three main exposures: regular smoking, alcohol consumption and overweight (BMI≥25 kg/m2) over the next 10 years in Finland. In scenario 1) prevalence of the exposure of interest remains the same as 2014, 2) same trend as past 10 years remains, 3) exposure prevalence decreases by 50% during 2015-2024 and 4) exposure decreases by 100%. We assume that only one exposure of interest changes and all others remain the same. After removal of exposure of interest, the risk of cancer gradually decreases during 20 years to the level of non-exposed. We utilized estimates of relative risk of exposures from FINRISK-study 1972-2007 and prevalence of exposure was obtained from AVTK annual population-based surveys between 2004-2014.

Results

If Finland were smoke free by 2024, we would avoid 13,000 lung cancers by 2034. By reducing the number of overweight people to half, 2,300 new prostate cancers and 1,900 colorectal cancers would be avoided by 2034. Demising alcohol consumption to half would avoid 1,500 colorectal cancers in males and 1,500 breast cancers in Finland.

Conclusion

Reduction of regular smoking should remain the most important target for cancer prevention even in the future. The role of reducing overweight as well as alcohol consumption is also essential.

Invasive breast cancers by detection mode among 50–69-year old women within an organized mammography screening: a twenty-year follow up study

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Aim

A large set of process parameters have been proposed for monitoring of organized breast cancer screening programmes. If these parameters have conflicting trends in calendar time, e.g., increasing invitational coverage with declining attendance, their overall effect on the screening performance may be difficult to access. We evaluated whether incidence by detection mode could be viewed as an overall measure in such situation.

Material and methods

Data on women diagnosed with invasive breast cancer in 1992–2014 were retrieved from the Finnish Cancer Registry and were linked with screening data obtained from the Mass Screening Registry. All breast cancers were evaluated with respect to mammography screening and were classified to screen-detected and interval cancers, and cancers in non-participants. Standardized incidence rates were calculated for all these three categories with respect to relevant source population (either numbers of participants or non-participants).

Results

Altogether more than 33 000 invasive breast cancers were identified among 50–69-year old women with complete screening data in 1992–2012. Of them, almost 60% were screen-detected cancers, 30% interval cancers, and about 10% cancers in non-participants.
Incidence of screen-detected breast cancer was increasing slightly with calendar time whereas that of interval cancer was fairly stable (Figure 1). Incidence of breast cancer among the non-participants had the largest fluctuations in calendar time.

Conclusion

Incidence of breast cancer and subsequent cause-specific mortality by detection mode can be useful and compact tool in evaluating overall performance of screening.

Figure 1
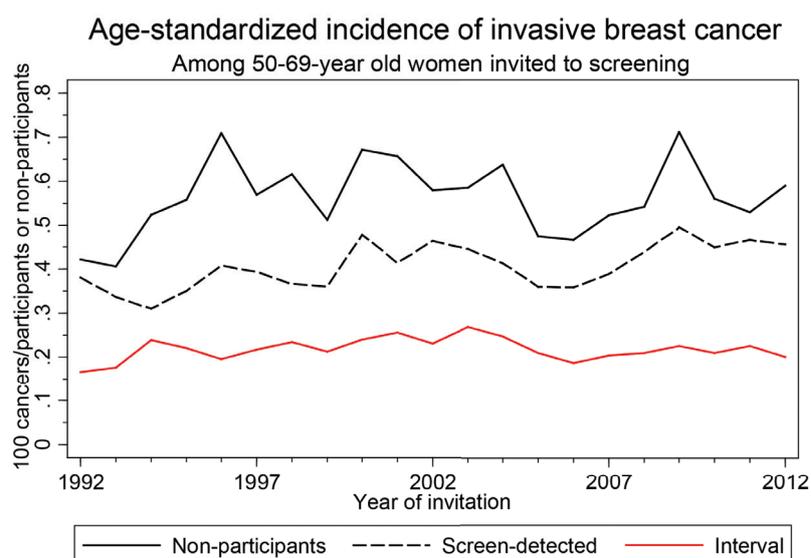
Age-standardized incidence of invasive breast cancer
Among 50-69-year old women invited to screening

Associations between volumetric mammographic density and breast cancer risk factors in the Norwegian Breast Cancer Screening Program

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Institution: Cancer Registry of Norway

Aim

We studied associations between percent and absolute volumetric mammographic density (MD), as assessed by a computerized system, and several lifestyle, reproductive, and hormonal exposures in a large cohort of Norwegian women.

Material and methods

The cohort consisted of women participating in the Norwegian Breast Cancer Screening Program between 2007 and 2014 (n=46 428). We estimated least squared means of percent and absolute volumetric MD associated with reproductive factors (age at menarche, age at first birth, number of pregnancies, and duration of breastfeeding), menopausal status, age at menopause, and hormone therapy use. We also studied self-reported height and body mass index (BMI), education, and other risk factors such as physical activity, alcohol use, and smoking.

Results

Percent and absolute volumetric MD was negatively associated with age and number of pregnancies, and positively associated with age at menarche, age at first birth, duration of breastfeeding, age at menopause, and height. The association between BMI and percent MD was strongly inverse, with a threefold higher percent MD in women with BMI<20 kg/m² than in women with BMI>33 kg/m². BMI was positively associated with absolute MD, with 1.5 times higher MD in the heaviest women. In contrast, the effect of menopausal status and postmenopausal hormone therapy was modest.

Conclusion

This large cohort analysis confirms findings from area-based studies that both percent and absolute volumetric MD is associated with several established breast cancer risk factors. The strongest association was found for BMI, and the direction of the association differed for percent and absolute volume.

Pregnancy-associated breast cancer (PABC); no evidence of patients' or doctors' delays

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Aim

A small, but not negligible, proportion of breast cancers in young women are detected in association with childbearing. While pregnancy usually is a period of intense medical observation, signs and symptoms of a malignancy may be overlooked or misinterpreted as pregnancy-related, resulting in diagnostic and treatment delays. We aimed to compare several defined waiting times from initial symptoms to start of treatment in women diagnosed with PABC and non-PABC.

Material and methods

Pregnancy-associated breast cancer (PABC) was defined as an invasive breast tumor diagnosed during pregnancy and up to two years post-delivery (non-PABC cases were diagnosed outside this time window, or nulliparous). Based on a systematic review of medical records for women aged 15-44 years at diagnosis with PABC and non-PABC identified in Swedish health care registers, chart information was retrieved by trained nurses for a total of 570 women (285 PABC women and 285 age and hospital matched non-PABC women) treated at 11 hospitals across Sweden between 1992 and 2009. Median waiting time (in days) from initial signs or symptoms to start of treatment, and time periods within, were estimated from Kaplan-Meier curves and compared using log-rank tests.

Results

Comparing women with PABC and non-PABC, the median time from first symptoms to first contact with health care was 36 and 45 days respectively (p-value 0.48), while between first contact and diagnosis it was 7 days for both groups (p-value 0.16). The median waiting time from date of diagnosis to initiation of treatment was shorter in women with PABC (22 days) compared to non-PABC women (26 days) (p-value 0.14), while between first contact and start of treatment it was 34 and 37 days respectively (p-value 0.14).

Conclusions

These results do not support the notion that diagnostic and treatment delays are more common in women diagnosed with breast cancer during or shortly after pregnancy.

The effect of colorectal cancer screening on self-perceived health and lifestyle

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Aim

Previous research implies that colorectal cancer (CRC) screening may have an effect on lifestyle. The aim of the current study was to evaluate the effect of CRC screening on self-perceived health and lifestyle among men and women within a randomized health-services study in Finland.

Material and methods

A random sample of 31 951 men and women born in 1951 randomized 1:1 for CRC screening for the first time in 2011 received a questionnaire on health and lifestyle (N=10271). The current study population responded to the questionnaire before and after screening in 2010 and 2012 (n=4895). Self-rated health (SRH), perceived healthiness of diet and perceived physical fitness were assessed with logistic and ordered logistic models using calendar time (2010, 2012), screening randomization and demographic characteristics as covariates.

Results

 SRH, healthiness of diet and physical fitness improved over time (OR 1.32, CI 1.17–1.48, OR 1.23, CI 1.08–1.41 and OR 1.44, CI 1.28–1.60, respectively). CRC screening invitation had no effect on these measures compared to controls (OR 0.91, CI 0.74–1.12, OR 0.95, CI 0.75–1.20 and OR 1.09, CI 0.87–1.37, respectively). Women reported better health than men. However, further analysis showed that the attender women reported weaker and the attender men better health than the corresponding control groups.

Conclusion

CRC screening did not have an effect on self-perceived health and lifestyle. However, the difference between men and women both in controls and in CRC screening attendees needs further research. The randomized setting enables us to generalize of the results to the whole screening target population.

Bladder Cancer epidemiology research based on data from the Cancer Registry of Norway

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Aim

The aim is to present the latest results from bladder cancer epidemiology research based on data from the Cancer Registry of Norway. We will present bladder cancer incidence and survival data of the past 30 years, estimate the prognosis of individual bladder cancer patients and enlighten the sex difference in survival of bladder cancer patients under consideration of factors like age and tumor stage.

Material and methods

Incidence and 5-year relative survival were calculated, stratified by sex, morphology, stage, age and diagnostic period. Flexible parametric models are used to both estimate the crude probabilities of death due to bladder cancer, stratified by gender, age and T Stage as well as to estimate the sex-related hazard-ratio in a time-dependent model.

Results

There is still an increasing trend in the incidence of bladder cancer. Survival rates slightly improved, but this increase is significant for local stages only but not for advanced stages. There is large variation in the estimated crude probabilities of death due to bladder cancer (from 3 to 76% within 10 years since diagnosis) depending on age, gender and T stage. Prognosis is significantly better for male bladder cancer patients the first two years after diagnosis only, after that, female patients do slightly better than male patients.

Conclusion

Registry data provide a useful resource for epidemiological research on bladder cancer.

The role of comorbidity in the management and prognosis in Non-Small Cell Lung Cancer: a population-based study

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Background

Coexisting disease constitutes a challenge for the provision of optimal cancer care.

Aim

We assessed the influence of comorbidity on treatment intensity and prognosis in patients with non-small cell lung cancer.

Materials and methods

Our study was based on information available in Lung Cancer Data Base Sweden (LcBaSe), a database generated by record linkage between the National Lung Cancer Register (NLCR) and several other population-based registers in Sweden. The NLCR includes data on clinical characteristics on 95% of all patients with lung cancer in Sweden since 2002. Comorbidity was assessed using the Charlson Comorbidity Index. Logistic regression and time to event analysis was used to address the association between comorbidity and treatment and prognosis.

Results

In adjusted analyses encompassing 19,587 patients with a NSCLC diagnosis and WHO Performance Status 0-2 between 2002 and 2011, those with stage IA-IIB disease and severe comorbidity were less likely to be offered surgery (OR 0.45; 95% CI 0.36-0.57). In late stage disease (IIIB-IV), severe comorbidity was also associated with lower chemotherapy treatment intensity (OR 0.76; 95% CI 0.65-0.89). In patients with early, but not late stage disease, severe comorbidity in adjusted analyses was associated with an increased all-cause mortality, while lung cancer specific mortality was largely unaffected by comorbidity burden.

Conclusion

Comorbidity contributes to the poor prognosis in NSCLC patients. Routinely published lung cancer survival statistics not considering co-existing disease conveys a too pessimistic picture of prognosis. Optimized management of comorbid conditions pre- and post NSCLC specific treatment is likely to improve outcomes.

Title: Assessment and trace back of lung cancer DCOs in Sweden

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Aim

We aimed to 1) assess the extent of underreporting of lung cancer in two Swedish Health Care Regions (Uppsala-Örebro and West); 2) estimate the impact on lung cancer incidence and one-year survival following inclusion of registrable cases initially identified by death certificate only (DCOs); 3) characterize DCO lung cancer cases; 4) develop and test a method allowing for efficient trace back of DCOs in Sweden.

Material and methods

Records of individuals with lung cancer identifiable by death certificates only in 2013 were cross-linked to the National Cancer Register (other cancer?) and the Patient Register (hospital care and consultations, date of diagnosis?). In a subsequent step, the electronic medical records of these individuals were accessed to confirm the diagnosis and retrieve date of diagnosis.

Results

Work is ongoing. Results on estimates of underreporting of lung cancer in the cancer register, number of identified DCOs, proportion registrable, and one year survival estimates following inclusion in the cancer register will be presented at the conference.

Conclusions

The project will provide information on the interpretation of incidence and survival data based on the Swedish Cancer Register and shed further light on issues related to comparability with data from cancer registries that routinely investigate and perform trace back of DCO cases. In addition, the combined experiences of the project will serve as proof of principle and an impetus for introducing a system for routine investigation of DCOs in Sweden.

Cancer incidence in the Janus Agricultural Cohort in Norway (JAC)– a register-based study

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Aim

The aim of the study was to identify all farm holders with a biological sample in the Janus Serum Bank Cohort and to investigate cancer risk in the cohort.

Material and methods

The cohort members were identified by linking the complete Janus cohort to the Population censuses (1960, 1970, 1980, and 1990), and the Agricultural censuses
(1969, 1979, 1989, 1999, and 2010) from Statistics Norway. The cohort was linked to the Cancer Registry of Norway to identify the number of incident cancer cases and to compare the risk of cancer with the risk in the complete Norwegian population.
Standard Incidence Ratios (SIR) were calculated as the ratio between the observed and expected numbers of cancer, and 95% confidence intervals computed. Follow- up from the first registration as a farm holder (earliest date is 01.07.1960) until 31.12.2014.

Results

A total of 40 639 individuals, 28 202 men and 12 437 women, were identified as farm holders with blood samples available in Janus. Altogether 8 433 incident cancer cases were observed, 6 065 in men and 2 368 in women. In men prostate cancer was the most common cancer, followed by cancer of the colorectum, lung and bladder. Breast cancer was the most common cancer in women, followed by genital organs, colorectum cancers and lymphoma. The risk of total cancer as well as lifestyle related cancers were significantly lower than in the general population (i.e. lung cancer in males; SIR=0,62 95% CI 0,57–0,66, in females; SIR= 0,47 95% CI 0,39–0,55).

Conclusions

Farm holders have significantly lower risk of cancer compared to the general Norwegian population.

Stage-specific incidence and survival of breast cancer in Norway: the implications of changes in coding and classification practice

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Institution: Cancer Registry of Norway

Aim

To describe the stage-specific incidence and survival trends of breast cancer in Norway, taken into account changes in coding and classification practice and the implementation of the Norwegian Breast Cancer Screening Program.

Material and methods

We identified all women diagnosed with invasive breast cancer in the period between 1980 and 2015. Changes in the coding and classification of breast cancer in the study period were described, and stage-specific incidence rates and relative survival were calculated.

Results

A total of 90 362 women were diagnosed with primary breast cancer, stage I–IV, or unknown stage, in the study period. The stage-specific incidence has been significantly influenced by changes in coding practice, classification system and the implementation of the screening program. These changes have mostly affected the proportion of cases that have been registered with stage I or with stage "unknown", but have also affected stage II, III and IV. The proportion of cases registered with stage I showed a clear increase during the implementation of the screening program, and was pronounced within the age-group 50–69. The stage-specific trends for relative survival seem to have been less influenced by changes in coding and classification of stage.

Conclusion

Our study has shown that the stage-specific incidence trends in Norway were influenced by changes in the coding and classification practice, and clearly illustrates the difficulties of evaluating stage-specific trends and stage migration for breast cancer over the study period.

Data quality of surgical procedures for cervical premalignant lesions in the Cancer Registry of Norway in 1998–2013

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Institution: Cancer Registry of Norway

Aim

Accurate information about treatment is needed to evaluate cervical cancer prevention efforts in the population. We studied completeness and validity of reporting treatment for cervical premalignant lesions at the Cancer Registry of Norway (CRN) for the first time.

Material and methods

We identified 3 981 untreated women diagnosed with high-grade cervical dysplasia in 1998–2013 from the CRN databases and linked them to hospital administrative data and Norwegian Patient Registry (NPR). From women without relevant treatment, we selected randomly 381, and reviewed their medical history in detail. We then compared receipt of treatment in the external data sources to the registry data in the CRN.

Results

Linkage revealed that 12% (473 out of 3 981) had a surgical or ablative procedures performed within one year after dysplasia diagnosis. Of missing treatment procedures, 65% were conisations, 28% hysterectomies and 6% ablative procedures. Type of missing treatment varied across women`s age at dysplasia.
We inquired 193 of randomly sampled women from pathology laboratories and reviewed 188 cases internally. Preliminary results suggest that CRN undercounted receipt of surgical procedures by 22% in a random sample. Hysterectomies and ablative procedures were due to underreporting whereas conisations were misclassified. Incomplete and inaccurate data was not limited to private laboratories.

Conclusions

The CRN captured correctly the majority of surgical procedures for cervical high-grade dysplasia, overall about 70%. Completeness and validity can be further improved through establishing rigorous coding practices and routine linkage between the NPR and the CRN.

Assisted reproductive technology and risk of borderline and invasive ovarian tumors in parous Swedish women

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Aim

To investigate if assisted reproductive technology (ART) for treating infertility is associated with the risk of ovarian cancer or borderline ovarian tumors (BOT).

Material and methods

In a population-based cohort of 1,340,097 women who gave birth 1982-2012, we investigated the relationship between ART, infertility and incidence of ovarian tumors. The cohort was followed through 2012.

Results

Women who gave birth following ART had higher incidence of both ovarian cancer (adjusted HR 2.12, 95% CI 1.53-2.93) and BOT (adjusted HR 1.84, 95% CI 1.25-2.72), compared to women with non-ART births. Compared to other women with infertility-related diagnoses, women with ART birth had significantly higher incidence of ovarian cancer (adjusted HR 1.55, 95% CI 1.07-2.25) but not BOT (adjusted HR 1.39, 95% CI 0.89-2.18).

Conclusion

Our results suggest that women who have gone through ART may be at an increased risk of ovarian cancer and BOT. At least part of this association seems to be due to the underlying infertility. As ART treatments are relatively new and ovarian cancer most often presents in women of older ages, more population-based studies with even longer follow-up are needed in order to confirm or refute our findings.

Attitudes and perceptions on the cervical cancer screening program and opportunistic Pap testing among healthcare providers in Finland

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Aim

In Finland an extensive opportunistic screening practice that concentrates especially on younger women exits alongside the national screening program. Awareness of the attitudes and perceptions on cervical cancer screening by healthcare providers is essential for determining procedures regarding the current screening practice in hopes of reducing unnecessary screening and improving adherence to cervical cancer screening guidelines.

Material and methods

A electronic survey will be conducted among healthcare providers in the cities of Helsinki, Espoo, Vantaa, Oulu and Kuopio in Finland to assess healthcare providers' attitudes, beliefs, knowledge and practices on pap testing and cervical cancer screening. The target group in our study are doctors, nurses, midwifes and laboratory personnel in the public primary, student and private healthcare and gynecology units in the secondary healthcare.

Conclusion

We believe that our study will give important information on how to intervene in the current practice of excessive opportunistic testing. Similar survey will also be conducted later on among young women.

Childhood cancer mortality influenced by parental socioeconomic background

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Aim

Parental education has been shown to have an influence on childhood cancer mortality also in the Nordic countries. We investigated the influence of parental education and working ability on childhood cancer mortality in Finland.

Material and methods

Using nationwide register data from 1990 to 2009 we identified 4,437 patients diagnosed with cancer under the age of 20. The outcome was death from primary cancer over 10 years. Parental educational level and information on working status were retrieved from Statistics Finland. Hazard ratios (HR) for cause-specific mortality were adjusted for follow-up time, age at cancer diagnosis and diagnostic calendar period.

Results

In the diagnostic period from 2000 to 2009, mortality was lower in patients with post-secondary parental education, HR 0.73 (CI 95 % 0.60-0.88) compared to primary education. A similar effect was not seen in the earlier period from 1990 to 1999. Also, mortality was higher in the patients if the mother was a student, HR 2.18 (CI 95 % 1.30-3.67) or if the father was long-term unemployed, HR 1.64 (CI 95 % 1.01 – 2.67) compared to patients who's parents were upper level employees.

Conclusion

In our study high parental education predicted lower mortality of childhood cancer patients. Also parental unemployment or student status was reflected in higher mortality of patients. This emphasizes the importance of education in early diagnostics and may be related to dealing with the child's chronic disease.

A bias-variance efficient method for estimating net survival

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Background

Net survival is an important measure of cancer survival. It is routinely reported by many cancer registries, and facilitates comparisons of survival between groups and time-periods. The past years have seen a debate over the most appropriate method for estimating this quantity. The traditional Ederer II approach have undesirable properties regarding bias, whereas the new method of Pohar-Perme potentially suffers from problems related to large variance.

Methods

We propose a new non-parametric estimator of net survival. Similar to the Pohar-Perme method, it is based on inverse probability of censoring weights. The difference is that we choose the weights to minimize mean squared error (MSE). Using both simulated and real data, we compare estimates of net survival using the Ederer II approach, the Pohar-Perme method and our new estimator and analyse the bias and variance properties of each estimator.

Results

The results show that in some cases one can obtain a large reduction in variance at the cost of minimal bias, particularly for longer-term follow-up of more than 10 years.

Conclusions

We show that our proposed bias-variance efficient estimator is a better alternative for estimating net survival, compared to existing non-parametric estimators.

The hospital resource use in the Finnish Colorectal Cancer Screening study

Suvi Mäklin

Institution: Finnish Cancer Registry

Aim

To compare utilization of hospital resources in the Finnish Colorectal Cancer Screening study between the screening and the control group. Furthermore, we aim to identify the respective impact of gender, invitation to screening and attendance to screening on the resource utilization.

Material and methods

People randomized to screening and control groups during years 2004-2009 are included in this analysis. Screening group comprises of 123 149 and control group of 122 930 people. All use of hospital resources during years 1999-2014 is derived from the national hospital discharge register and from the national CRC screening center. Descriptive statistics for outpatient visits, inpatient episodes, and colonoscopies are reported. Resource utilization is compared between the screening and the control groups.

Results

According to the preliminary results, only a minority of people in both groups had not used hospital resources at all during the study period. More people in the screening group than in the control group had at least one hospital-based outpatient visit, inpatient episode and colonoscopy. After the first screening round, the proportion of positive FOBT people with at least one outpatient visit, one inpatient episode or one colonoscopy was higher than that of those with a negative FOBT result, respectively. During second and third screening rounds the difference seems to diminish. The final results will be presented at the meeting.

Conclusion

CRC screening using FOBT seems to increase slightly the volume of hospital outpatient visits, inpatient episodes and hospital colonoscopies in Finland after the first screening round and most of the increase is due to positive screening tests.

Trends in incidence, mortality and survival of invasive penile squamous cell cancer in Norway 1956–2015

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Aim

To describe penile squamous cell carcinoma (SCC) incidence, mortality and survival rates and trends in Norway 1956–2015.

Material and methods

Penile cancer data 1956–2015 was extracted from Cancer Registry of Norway. We calculated penile SCC age-standardised incidence and mortality rates per 100,000 man-year. 5-year relative survival (RS) was calculated with cohort and period approach and were age-standardised using International Cancer Survival Standard weights. By stage, only penile SCC localized and regional spread cases were included into the 5-year RS analysis. Penile SCC incidence, mortality and survival trends were assessed with joinpoint regression, and the annual percentage changes (APC) were calculated.

Results

In total, 1,496 penile cancer cases were diagnosed during the 60-years. Of all the cases, 1,389 (92.8%) were penile SCC. The most frequently affected anatomical site was the glans (62.3%). 68.2% cases were localized tumors and 21.3% regional spread tumors. Over 60-years, the penile SCC incidence increased significantly, APC 0.63% (95%CI: 0.27; 0.96, p=0.001). Mortality rates and 5-year RS showed no significant increase trend, APC 0.27% (95%CI: -0.12; 0.66, p=0.17) and APC 0.25% (95%CI: -0.05; 0.55, p=0.10), respectively. Patients with localized tumors had higher 5-year RS than patients with regional spread tumors, and both had positive trend: APC 1.68% (95%CI: 0.12; 3.26, p=0.04) and APC 4.04% (95%CI: -1.51; 9.90, p=0.14), respectively.

Conclusion

Penile SCC incidence increased significantly, while mortality and survival showed no statistically significant change. Because of majority of penile SCC are attributable to HPV, our results may suggest increased HPV prevalence in population.

Inviting women to cervical cancer screening at the age of 65

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Institution: Finnish Cancer Registry, Mass Screening Registry

Aim

In Finland the organized cervical cancer screening program invites women for routine screening up to the age of 60. Some municipalities also invite 65-year-olds. The aim is to study whether screening at the age of 65 reduces cervical cancer mortality.

Material and methods

Screening records for women aged 55 and above were collected from the mass screening registry in 1991—2014 (612 622 women born in 1926—1946). Cervical cancer deaths (N=265) were linked from the cancer registry for women aged 65 and above.

Results

Of all women, 383 411 were invited of whom 85% attended to screening at least once during the follow-up. Thirteen percent of the women aged 65 were invited to routine screening. The risk of death due to cervical cancer was smaller for women who were screened at age 65 (RR = 0.56, 95% CI = 0.32–0.95).

Conclusions

Mortality was reduced for women screened at the age of 65. However, a more detailed examination of the effect of previous screening history is still needed, e.g. taking into account participation to screening at younger ages and previously detected abnormalities. The results will help to assess until what age the whole target population should be invited to screening.

Nordscreen – an interactive tool for presenting cervical cancer screening indicators in Nordic countries

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Institution: Finnish Cancer Registry

Aim

Quality assurance and improvement of cancer screening programs require up-to-date monitoring systems. The Nordscreen database is planned to include performance and outcome indicators for cervical cancer screening programs in the Nordic countries and Estonia. Publicly available tool facilitates comparison of cancer screening programs.

Material and methods

The screening data originates from mass screening registries in each of the Nordic countries and Estonia. The developed indicators are based on the European guidelines for cervical cancer screening and other ongoing research projects. Fact sheets summarising the cancer screening policies and programs will be created to provide context for the indicators.

Results

Currently cervical cancer screening test coverage data is available from Norway (years 1992 - 2015) and Finland (1991 - 2014) with other countries to be included soon. The test coverage within screening interval of 3 years in age group 30-59 was 75.0% in Norway in 2014 (60.4% in Finland). Test coverage in 2014 increased to 90.4% in 10-year follow-up in Norway (82.2% in Finland). The application can be present data in graphical or table form based on user specifications.

Conclusion

Lower test coverage in Finland can be explained by policy of 5-year screening interval and that mass screening registry in Finland only includes tests that are provided within the organized screening process whereas Norwegian data includes all cervical tests. Despite some limitations, the performance and outcome indicators are likely to be relevant to many stakeholders. The database can be expanded to screening programs for breast and colorectal cancer.

Regional variation in cancer survival in Finland in 1960–2014

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Aim
Quantify regional variation in cancer survival i) between hospital districts and ii) between municipalities within hospital districts in Finland.

Material and methods
Excess mortality of patients diagnosed with 13 cancer sites in Finland and followed up in 1960-2014 was modelled by using a piecewise constant hazard model with spatially structured and unstructured regional random effects. Variation was quantified in the terms of standard deviations in 5-year net survival.

Results
Variation within hospital districts in 2000–2014 was on average 1.6-fold compared to variation between hospital districts. In variation between hospital districts, the standard deviation was the largest in tumors of brain and central nervous system (4.4 percentage points, pp) and leukaemia (4.1 pp). In variation within hospital districts, the standard deviation was the largest in leukaemia (6.1 pp) and kidney cancer (5.6 pp). In lung cancer, variation within hospital districts was clearly larger in females (3.8 pp) than in men (1.5 pp). From 1995–2004 to 2005–2014, variation increased in pancreatic cancer and decreased in prostate cancer.

Conclusion
Variation between and within hospital districts are both important when assessing regional equity in cancer survival. Variation in 5-year net survival depends also on the average level of net survival that should be taken into account when interpreting results.

Loss in working years after a breast cancer diagnosis

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Aim

More than half of all women with breast cancer are diagnosed during working age. We present a new measure of public health relevance to estimate the loss in working years after a breast cancer diagnosis.

Material and methods

Women of working age diagnosed with breast cancer between 1997 and 2012 were identified in the Breast Cancer Data Base Sweden (N=19,661), together with a breast cancer-free comparison cohort (N=81,303). Women were followed until receipt of disability pension, old-age retirement, death or censoring. Using flexible parametric survival modelling, the loss in working years was calculated as the difference in the remaining years in the work force between women with and women without breast cancer.

Results

The loss in working years was most pronounced in younger women and in women with advanced stage disease. Women aged 50 years at diagnosis with stage I disease lost on average 0.6 years (95% CI, 0.4-0.8) of their remaining working time; the corresponding estimates were 1.2 years (1.0-1.5) in stage II, 3.2 years (2.7-3.7) in stage III, and 8.8 years (7.9-9.8) in stage IV disease. Treatment modality was a determinant, with higher loss in working years among women treated with axillary lymph node dissection, mastectomy and chemotherapy.

Conclusion

By use of a new measure we show a loss in working years not only in late but also in early stage breast cancer. Our results should motivate further efforts to limit long-term sequelae and support work participation in women diagnosed with breast cancer during working age.

Defining cohort follow-up time for standardized cancer incidence ratio

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Aim

Our aim is to demonstrate the theoretical differences and empirical consequences between two ways of defining follow-up in studies using standardized incidence ratios (SIR). When estimating cancer incidence, it is reasonable to end the patient's follow-up at first cancer diagnosis. Often it is more convenient to continue the follow-up until censoring, e.g. death or the end of the study period, for example when it is not possible to remove cancer prevalent person-years from population rates.

Material and methods

The difference between these two designs are demonstrated in two patient cohorts. First one is the Finnish Neurofibromatosis 1 (NF1) gene mutation cohort (N=1427 and 271 cancers), that is a high cancer risk cohort specifically at younger age. The second cohort is the Finnish asbestos miner cohort (N=999 and 245 cancers). The reference population rates are corrected to match each study design by removing cancer prevalent person-years. A simulation study is conducted to identify scenarios when these two estimates differ most.

Results

In the NF1 cohort, when follow-up ended at the first primary cancer the SIR (SIR = 26.3 [95% CI: 23.0-30.0]) was almost two times higher when follow-up is continued until censoring (13.2 [11.7-14.9]). In asbestos cohort both designs resulted nearly the same estimates (first primary cancer SIR 1.16 [1.02-1.33] and all cancers SIR = 1.17 [1.03-1.32]).

Conclusion

The two different study designs produced inconsistent SIRs in the NF1 cohort. Selection between these designs should be based on the research question: whether it is cancer incidence or overall cancer tendency of the patient.

Literature Review on Cancer Risk in Children Born after Fertility Treatment

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Aim

Medically assisted fertility treatment, including assisted reproductive technology (ART), is increasing in use. Subsequently, child health outcomes are of interest. Some studies have suggested elevated risk of somatic morbidity, others report elevated cancer risk. This review provides an updated summary of current literature on fertility treatments and pediatric cancer.

Material and Methods

This review is based on an electronic systematic search in Ovid Medline 1946 to October 25 2013, Ovid Embase 1947 to October 25 2013. The following key words were in the search: assisted reproductive technology, ART, ovarian stimulation, fertility treatment, ovulation induction, gonadotropins, in vitro fertilization, neoplasms, cancer, cancer risk, cancer incidence, childhood cancer, leukaemia, young adult.

Results

178 relevant abstracts concerning cancer and, or, childhood / young adulthood were assessed. Of these, 36 pertained to cancer risk in children and young adults following maternal infertility treatment. Further selection based on eligibility, rendered a final 23 articles for inclusion in the review.
Eleven out of twelve studies assessing the risk of overall cancer risk in children conceived by ART detected no significant elevation in risk. However, risk of childhood leukaemia was reported elevated by six of the ten studies.
Large cohort or population-based studies, including more cancer cases and longer follow-up times, are lacking.

Conclusion

Although findings were reassuring for overall childhood cancer, a significant few studies suggested elevated risk of haematological cancers. More large population-based studies are needed, and continued observation of the growing population of ART children is warranted.

Cancer Risk in Women Treated with Fertility Drugs According to Parity status - A Registry-based Cohort Study

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Aim

Long-term safety of assisted reproductive techniques (ART) is of interest as use is increasing. Cancer risk is known to be affected by parity. This study examined risk of cancer after fertility treatment, stratified by women's parity.

Material and Methods

Data was obtained on all women (n=1 353 724) born in Norway between 1960-1996. Drug exposure data (2004-2014) was obtained from the Norwegian Prescription Database [drugs used in ART and clomiphene citrate (CC)]. The Medical Birth Registry of Norway provided parity status. Hazard ratios were calculated for all site cancer, breast, cervical, endometrial, ovarian, colorectal, central nervous system, thyroid cancer and malignant melanoma.

Results

In 12 354 392 person-years of follow-up, 20 128 women were diagnosed with cancer. All-site cancer risk was (1.14, 1.03-1.26) and (1.10, 0.98-1.23) following CC and ART exposure respectively. For ovarian cancer, a stronger association was observed for both exposures in nulliparous (HR 2.49, 1.30-4.78, and HR 1.62, 0.78-3.35) versus parous women (HR 1.37, 0.64-2.96, and HR 0.87, 0.33-2.27).
Elevated risk of endometrial cancers was observed for CC exposure in nulliparous women (4.59, 2.68-7.84 vs. 1.44, 0.63-3.31). Risk was elevated for breast cancer in parous women exposed to CC (1.26, 1.03-1.54) and among nulliparous women after ART treatment (2.19, 1.08-4.44).

Conclusion

CC appears associated with increased risk of ovarian and endometrial cancer. Elevations in risks of breast and thyroid cancer were less consistent across type of drug exposure and parity. Continued monitoring of fertility treatments is warranted.

Cross-border documentation and analyses of quality of cancer care in Germany and Denmark within the project Innovative High Technology Cancer Treatment Denmark-Germany (InnoCan)

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Aim

InnoCan is a German-Danish Interreg project for improving oncological care. In our work package, we aim to enhance cross-border documentation of cancer cases, to assess and compare survival after breast and colorectal cancer and to strengthen the "patient's voice" in medical care decision making for improving health care quality.

Material and methods

Based on a common data base with Danish and German data for breast and colorectal cancer containing epidemiological and clinical variables, survival analyses taking into account covariates (e.g. stage, treatment) will be performed. A comparison of German and Danish clinical guidelines and quality indicators will be carried out in order to identify core variables in clinical cancer registration for harmonization of data. For strengthening the "patients' voice", the Danish Barometer-Survey tool for routine collection of patient reported experiences (PREs) and patient reported outcomes (PROs) will be adapted for use in Germany.

Results

So far, we have signed data handler agreements and exchanged epidemiological data. The collection of high-resolution clinical data in Germany is completed and the exchange of survival data can start soon. We searched for clinical guidelines and predefined quality indicators. These documents are already exchanged. We have applied for ethical approval from the ethical committee at the University of Lübeck for a pilot study on PREs and PROs among German breast and colorectal cancer patients.

Conclusion

Mutual learning within the project will contribute to explaining differences observed in our data and to improving the quality of oncological care across the borders.

New strategy for colorectal cancer screening in Finland

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Aim

European Commission recommends colorectal cancer (CRC) screening as a public health policy. In Finland, CRC screening was introduced as a randomized, biennial program for men and women aged 60-69 years in 2004. Performance estimates of this gFOBT-based program were comparable to those of corresponding European programs. The interim results of effectiveness showed, however, similar CRC mortality in the screening and control arms with a non-significant increase in CRC mortality in women in the screening arm. These results and the evolution in the analytical capacity of screening tests induce a need to find a new screening strategy for Finland.

Material and methods

The new CRC screening program will be included in the National Act of Screening. The program is to be coordinated centrally and implemented gradually in 2019-2028. Men and women aged 60-74 years will be invited to biennial FIT- screening. A questionnaire concerning risk factors for CRC will be sent to all invitees.

There will be a special focus on the selection of a valid test with an adjustable cutoff based on gender variation, colonoscopy resources and performance of other European CRC screening programs. Also the age of initiation will be considered.

Results

Detection of high-grade adenomas and CRCs, and death from CRC will be followed and compared between age groups, genders and various risk profiles during the implementation phase. Effectiveness of the program will be evaluated in 2030.

Conclusion

Finland will introduce a nationwide CRC screening program which is effective in reducing CRC mortality of both genders.

Breast symptoms and the risk of subsequent interval cancers and lethal breast cancers

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Aim

The study aim was to estimate the association of breast symptoms reported at screen with subsequent interval breast cancers and breast cancer deaths.

Methods

The current study was nested within the national breast cancer screening program using individual data available from the screening registry (1992-2012) and national Finnish Cancer Registry (1992-2014). Individual visits with breast symptoms at screen (exposure group, n=213726) were frequency matched to non symptomatic visits to form a reference group (n=213726). The risk of interval cancers and lethal breast cancers were compared in those who reported symptoms to those with no symptoms. Poisson regression model was used to estimate the risk at 95% confidence interval.

Results

The risk of interval cancer was higher in those who reported lump (RR=3.48, 95% CI 3.16-3.82), retraction (RR=1.50, 95% CI 1.28-1.75) or secretion (RR= 2.65, 95% CI 2.04-3.37) compared to those with no reported symptoms. In those interval cancers where lump was reported at index screen, the risk of dying from interval cancer was also higher (RR= 1.82, 95% CI 1.31-2.44) compared to those without a lump. Sensitivity of the mammography test as well as the overall screening episode was higher in those who reported a symptom (e.g. for a lump the test sensitivity was 82.2% (95% CI 80.4-83.9) and episode sensitivity 78.5% (95% CI 76.7-80.3))

Conclusion

Compared to non-symptomatic women, we found elevated risk of interval cancer and lethal breast cancers in women who reported symptoms at screen. Our study indicated that women with symptoms, especially a lump, may need to be re-screened sooner than the normal screening interval of two years.

Ductal carcinoma in situ in, comparison of diagnosis and treatment in Iceland with Uppsala-Örebro region Sweden

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Aim

Ductal carcinoma in situ (DCIS) is a localized cancer formed in the epithelial cells of the mammary duct. The purpose of this study is to get a comprehensive overview of diagnosis and treatment of DCIS in Iceland in comparison with a study from Uppsala-Örebro region in Sweden (UÖR).

Materials and methods

Patients with DCIS in 2008-2014 were identified in the Icelandic Cancer Registry (n=110). A registry form was adopted from INCA, the Swedish Cancer Registry and the variables of each case collected through medical records from the University Hospital of Iceland. Previously published data from 796 women with DCIS in UÖR 2008-2012, were used for comparison.

Results

Mammography screening detected 82% of DCIS cases in Iceland and 74% in UÖR. In Iceland 51% underwent breast conserving surgery (BCS) and 49% mastectomy compared with 60% and 39% in UÖR (P=0,06). In Iceland 27% of BCS treated cases underwent radiotherapy compared with 68% in UÖR (P<0,05). Comparison with UÖR revealed a higher ratio of nuclear grade 2 diagnoses in UÖR.

Conclusion

Comparison between Iceland and UÖR revealed differences in both diagnostic and treatment variables for patients with DCIS. Ratio of BCS and mastectomy was slightly higher in Iceland than in UÖR and the use of radiation therapy after BCS was lower in Iceland. For countries like Iceland implementing a clinical quality register for cancer, comparison and bench-marking clinical data with established registers like those in Sweden gives immediate results of significance of worth for clinicians to look closer at.

Measured anthropometric factors and cutaneous melanoma risk: Data from the population-based Janus cohort

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Aim

The aim of the present study was to prospectively examine risk of cutaneous melanoma (CM), and Breslow thickness according to measured anthropometric factors, adjusted for exposure to ultraviolet radiation (UVR) in a large population-based cohort in Norway.

Material and Methods

The Janus Serum Bank Cohort, including 292,851 Norwegians recruited 1972–2003, was linked to the Cancer Registry of Norway and followed for CM through 2014. Cox regression was used to estimate hazard ratios (HRs) with 95% confidence intervals (CIs) of CM risk. Linear regression was used to associate Breslow thickness with anthropometric factors among cases. All analyses were adjusted for age, UVR exposure, education, and smoking status.

Results

After a mean follow-up of 26-years, 3000 incident CM cases were identified. In men, we found positive associations with CM for body mass index (BMI), body surface area (BSA), height, and weight (all Ptrends <0.001). In women, CM risk increased with increasing BSA (Ptrend 0.001), height (Ptrend <0.001), and weight (Ptrend 0.041). Increase in weight was associated with increased CM risk in men normalweight at baseline (P 0.035) and in women overweight at baseline (P <0.001). An association between increasing BMI and increasing Breslow thickness was seen in women (Ptrend 0.001), but not in men (Ptrend 0.380).

Conclusion

Our results suggest that large body size, in general, is a CM risk factor in men, and that height and weight gain are the strongest risk factors in women. Further studies are needed to determine the behavioral and biological mechanisms underlying these observations.

Long-Term Health-Related Quality of Life in the Finnish Randomized Study of Screening for Prostate Cancer

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Finnish Cancer Registry

Aim

The impact of prostate cancer screening is partially evaluated by the long-term health-related quality of life effects. The purpose of this study was to explore the generic and disease-specific health-related quality of life in the prostate cancer screening arm compared to control arm up to 15 years of follow-up.

Material and methods

Data derive from the Finnish Randomized Study of Screening for Prostate Cancer (N=80 458). Generic and disease-specific health-related quality of (HRQoL) life was measured using RAND 36-Item Health Survey and UCLA Prostate Cancer Index. Questionnaires were delivered to newly diagnosed patients 1996-2006 (N=5128) at the time of diagnosis, at 3 and 12 months and 5, 10 and 15-years follow-up. N=1104 (21.5%) returned the baseline HRQoL questionnaire. Analyses for repeated-measures were conducted with random effects model.

Results

There was a steep decline in Urinary and Sexual Function and Bother at the first follow-up after primary treatment in both arms, which improved slightly at 12-month follow-up. No such decline was seen in bowel symptoms or in the generic quality of life. At the time of diagnosis screening arm had statistically significantly higher scores in Urinary and Sexual Bother, and Sexual Function. In all screening arm reported better quality of life in Urinary and Sexual Bother and Sexual Function. The overall effect of screening on disease-specific quality of life was not modified by time.

Conclusion

Prostate cancer screening resulted in some differences for the prostate cancer-specific quality of life in the 15-year follow-up in favor of the screening arm.

The Danish lung cancer patient pathway – who's in and who's out?

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Documentation and Quality, The Danish Cancer Society.

Aim

Denmark introduced cancer patient pathways (CPP) to ensure well-organised pathways without unnecessary waiting time from referral to possible treatment. Compliance with standard timeframes is monitored nationally using the National Patient Registry (NPR). However, published monitoring results only provide information on patients with completely registered CPPs.

The aim of this study is to assess whether there are differences in the health-related characteristics of lung cancer patients with a complete lung CPP compared to those who only had partial registrations of the CPP or none at all.

Material and methods

The study is a register-based study including all individuals diagnosed with lung cancer in the years 2013-2015 (Danish Cancer Registry). Information on registrations in a lung CPP were obtained from the NPR. Gender, age, residential region of Denmark, comorbidity, survival and stage were compared using $\chi2$-tests. We also analysed the odds of a complete CPP in a multivariate logistic regression with gender, age, comorbidity and residential region as explanatory variables.

Results

Preliminary results indicate that lung cancer patients who were not registered with a full CPP were more likely to be older, have higher level of comorbidity and poorer outcomes in terms of survival. Final results will be presented at the meeting.

Conclusion

The study provides new insights concerning the coverage of the lung CPP and points to possible characteristics that may make compliance with a standardised CPP less likely.

Educational differences in breast cancer survival among women diagnosed before age 50 during 1990-2012 in Norway.

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Aim

To quantify educational differences in breast cancer specific survival among women diagnosed before age 50 in Norway.

Material and methods

Using individually-linked Norwegian Registry data, we followed all women diagnosed with a first invasive malignant breast cancer at age 30-48 years during 1990-2012 (N = 10349). Women were followed from breast cancer diagnosis until death, emigration or 31.12.2013, whichever came first. Education level was categorised as compulsory (low), secondary (medium) or tertiary (high). We quantified educational differences in breast cancer specific survival using Flexible Parametric Models adjusted for age and year at diagnosis. We used restricted cubic splines to allow the effect of education to vary by time since diagnosis.

Results

In total, 2257 (22%) of women died of breast cancer during a median follow-up time of 8.2 years. Low education level was associated with significantly greater risk of dying of breast cancer. Educational differences in breast cancer survival were greatest during the first two years after diagnosis, and then gradually declined with time since diagnosis. The hazard rate ratio (with 95 % confidence intervals) for breast cancer-specific death among lower compared to higher educated breast cancer patients was 1.73 (1.38-2.21) for the first two years after diagnosis, 1.50 (1.29-1.74) for five years after diagnosis, and 1.46 (1.28-1.66) for ten years after diagnosis. Educational differences in breast cancer survival increased with later stage at diagnosis.

Conclusions

High education level is associated with better breast cancer survival among women diagnosed before age 50 in Norway.

IMPLEMENTING PRIMARY HIGH-RISK HUMAN PAPILLOMAVIRUS TESTING IN NORWEGIAN CERVICAL CANCER SCREENING

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Objectives

To safely implement a shift of primary cervical screening from cytology to hrHPV detection, we evaluated comparatively liquid based cytology (LBC) screening every 3 years (current screening method) and high-risk human papilloma virus (hrHPV) testing every 5 years in Norway (health service study trial number 006_2014_10_RHS).

Methods

Between February 2015 and April 2017, approximately 140,000 women, aged 34 to 69 years who returned for their routine, triennial cervical cancer screening, were assigned either hrHPV-testing (cobas® HPV Test (Roche Diagnostics) genotyping HPV16 and 18) or LBC, based on even/odd day of birth. Cervical intraepithelial neoplasia grade 2, 3 and cervical cancer (CIN2+) were detected among 32,434 women who had completed their follow-up of positive screening test by early2017.

Results

Screening attendance after a reminder letter was comparable in HPV-screening and LBC-screening, being approximately 50% after 1st and 30% after 2nd reminder. Proportion of screening positives declined by increasing age, mean value being 5.4% in LBC-screening and 6.4% in HPV-screening. Compared to LBC-screening, we observed 40% more biopsy, 78% more CIN2+ and 50% more CIN3+ in HPV-screening.

Conclusions

A shift of primary cervical screening from cytology to hrHPV detection, although only for women aged 34 to 69 years, implies a major shift in the technical infrastructure for screening. HPV-screening did not influence the screening attendance and detected more pre-cancers, suggesting that HPV-screening should replace LBC-screening. Randomized implementation of HPV-screening allows reassure the high quality of the program and reduce the significant burden for the gynecology and pathology service at the start of the transition.

Oestrogen receptor status, treatment and breast cancer prognosis in Icelandic BRCA2 mutation carriers

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Aim

The impact of an inherited BRCA2 mutation on the prognosis of women with breast cancer has not been well documented. We studied the effects of oestrogen receptor (ER) status, other prognostic factors and treatment on survival in a large cohort of BRCA2 mutation carriers.

Material and methods

We identified 285 breast cancer patients with a 999del5 BRCA2 mutation and matched them with 570 non-carrier patients. Clinical information was abstracted from patient charts and pathology records and supplemented by evaluation of tumour grade and ER status using archived tissue specimens. Univariate and multivariate hazard ratios (HR) were estimated for breast cancer-specific survival using Cox regression. The effects of various therapies were studied in patients treated from 1980 to 2012.

Results

Among mutation carriers, positive ER status was associated with higher risk of death than negative ER status (HR=1.94; 95% CI: 1.22–3.07, P=0.005). The reverse association was seen for non-carriers (HR=0.71; 95% CI: 0.51–0.97; P=0.03).

Conclusion

Among BRCA2 carriers, ER-positive status is an adverse prognostic factor. BRCA2 carrier status should be known at the time when treatment decisions are made.

Assessment of unmet medical needs in the management of Hodgkin lymphoma with special focus on the elderly – A population-based study of patients diagnosed in Sweden 1973–2014

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Aim

Despite improvements in survival for all age groups, Hodgkin lymphoma (HL) patients aged above 50 years do worse. We sought to define the unmet medical needs in older patients.

Material and methods

Using data from the nationwide Swedish Cancer Registry (1973-2014) and Swedish Lymphoma Registry (2000-2013) we estimated relative survival ratios (RSRs) for 7,997 HL patients (median age 44 years; range 2-99; 45% ≥50 years).

Results

The 1-year RSRs (95% confidence interval; CI) for males aged 55, 65, 75, and 85, diagnosed in 2013, were 0.95 (0.89-0-97), 0.86 (0.81-0.90), 0.70 (0.60-0.79)and 0.49 (0.33-0.63), respectively. The corresponding 1-year RSRs for females were 0.97 (0.92-0.99), 0.92 (0.87-0.95), 0.81 (0.72-0.88) and 0.63 (0.47-0.75). The survival improvements observed since the early 1970s did not continue at the same rate into the new millennium. No improvements from 2000 to 2013 were seen among men aged 55, 65, or 75 years although we did see improvements for men aged 85 years at diagnosis. For females, small improvements were observed in 65- and 75-year-olds, whereas for 85-year-olds the improvements were relatively large. We saw no clear evidence of changes in the distribution of disease or patient characteristics 2000-2013.

Conclusion

These results confirm age to be a very strong predictor of survival. Patients >65 years constitute a large group with clearly unmet medical needs, with lack of improvement of RSR in men during the latest years. Clinical trials including older patients, novel agents, and comprehensive care will hopefully improve the outlook for older HL patients. Our study provides a baseline for outcome comparison after the broader introduction of targeteddrugs.

Menopausal hormone therapy and risk of melanoma: do estrogens and progestins have a different role?

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Aim

The aim of this study was to analyse the association between use of menopausal hormone therapy (HT) and occurrence of skin malignant melanoma (SMM).

Material and methods

We investigated the issue in a nationwide cohort of 684,696 Norwegian women, aged 45-79 years, followed from 2004-2008. The study was based on linkage between Norwegian population registries. Multivariable Poisson regression models were used to estimate the effect of HT use, different HT types, routes of administration, and doses of estrogen and progestin on the risk of SMM.

Results

During the median follow-up of 4.8 years, 178,307 (26%) women used HT, and 1476 incident SMM cases were identified. Current use of HT was associated with increased risk of SMM (rate ratio (RR) = 1.19; 95% confidence interval (CI) 1.03-1.37). Plain estrogen therapy was associated with an increased risk of SMM (RR 1.45; 95% CI 1.21-1.73), both for oral (RR 1.45; 95% CI 1.09-1.93) and vaginal (RR 1.44; 95% CI 1.14-1.84) formulations, while combined estrogen and progestin therapy (EPT) was not (RR 0.91; 95% CI 0.70-1.19). We performed a dose-response analysis of estrogen and progestin in women using tablets, and found that use of estrogens was associated with increased risk (RR 1.24; 95% CI 1.00-1.53 per 1 mg/day) and use of progestins with decreased risk (RR 0.71; 95% CI 0.57-0.89 per 10 mg/month) of SMM.

Conclusion

Estrogens were associated with increased risk of SMM, while combinations of estrogens and progestins were not. Our results suggest that estrogens and progestins might affect the risk of SMM in opposite ways.

Menopausal hormone therapy and colorectal cancer: a linkage between nationwide registries in Norway

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Aim

We aimed to investigate the association between menopausal hormone therapy (HT) and risk of colorectal cancer (CRC).

Material and methods

We investigated the issue in a nationwide cohort of 684,703 Norwegian women, aged 45-79 years, followed from 2004-2008. The study was based on linkage between Norwegian population registries. Each woman contributed person-years at risk as non-user, current user and/or past HT user. The outcome of interest was adenocarcinoma of the colorectal tract, overall, by anatomic site and stage at diagnosis. Incidence rate ratios (RR) with 95% confidence intervals (95% CI) were estimated by Poisson regression and were used to evaluate the association between HT and CRC incidence.

Results

During the median follow-up of 4.8 years, 178,309 (26%) women received HT and 4,137 (0.6%) incident CRCs occurred. Current, but not past, use of HT was associated with a lower risk of CRC (RR 0.85; 95% CI 0.77-0.93). RRs for localized, regionally advanced and metastatic CRC were 1.15 (95% CI 0.93-1.41), 0.80 (0.70-0.92) and 0.70 (0.56-0.87), respectively. Current use of estrogen therapy (ET) was associated with a reduction of CRC risk (RR 0.82; 95% CI 0.72-0.93), both in oral (RR 0.81; 95% CI 0.66-0.99) and vaginal (RR 0.78; 95% CI 0.65-0.93) administrations but not estrogen-progestin therapy (EPT) was not (RR 0.91; 95% CI 0.76-1.08). For women 55 years and older we obtained similar RRs for current use of ET and EPT versus non-use: 0.82 (95% CI 0.71-0.93) and 0.83 (95% CI 0.68-1.01), respectively.

Conclusion

In our nationwide cohort study, HT use lowered the risk of CRC, specifically the most advanced CRC.

Variation in the use of palliative radiotherapy in Norway

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Aim

Palliative radiotherapy (PRT) comprises half of all radiotherapy use and is an important treatment modality for improving quality of life in incurable cancer. We described the use of PRT in Norway and aimed to identify and quantify factors associated with PRT utilization.

Material and methods

Population-based data from the Cancer Registry of Norway identified 25,281 patients who died of cancer (1 July 2009–31 Dec 2011). The proportion of patients who had PRT within the last two years of death (PRT2Y) was calculated. Individual data on socioeconomic factors from Statistics Norway, were also extracted and multivariable logistic regression was used to determine factors that influenced the PRT2Y.

Results

The overall PRT2Y was 29.6% with wide geographic variations (crude inter-county range, 21.9%–38.2%). PRT use was associated with sex, age, cancer site and survival time and significantly higher in patients with high household income (adjusted odds ratio (OR)=1.56) and for patients diagnosed in a hospital with radiotherapy services (OR=1.42). Patients with travel distances between 100-499 km and patients in certain counties were less likely to have PRT.

Conclusion

Despite free universal healthcare in Norway, the use of PRT seems influenced by factors unrelated to patients needs. Unexplained geographic variations exist.