Cancer mortality by migrant Background in the 2000s in Belgium: patterns and determinants
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Published in:
9th European Public Health Conference All for Health, Health for All Vienna, Austria 9–12 November 2016

Publication date:
2016

Document Version:
Final published version

Citation for published version (APA):
Lifestyle effects of colorectal cancer screening. Population-based survey study in Finland
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Background
The European cancer screening guidelines recommend colorectal cancer (CRC) screening for 50-74-year-olds. CRC mortality can be reduced with screening, but it is yet unclear if CRC screening affects various lifestyle related factors. Due to population-level nature of screening, even minor adverse effects in health related lifestyle might have relevance for public health. A national programme for CRC screening with repeated faecal occult blood (FOB) testing followed by colonoscopy for test positives has been running in Finland since 2004. Our aim is to clarify, if screening is introducing harmful effects on colorectal cancer risk related life style, thus reducing the potential benefit of an otherwise feasible screening programme.

Methods
A population-based random sample of 10648 Finnish adults born in 1951 living in the municipalities voluntarily involved in CRC screening programme were sent a lifestyle questionnaire in 2010. In 2011, the 60-year old cohort was independently randomised (1:1) for their first ever CRC screening (invited) or control group (not contacted). The questionnaires were repeated in 2012 for all. From both survey rounds, 2508 pairs of completed questionnaires were available for analysis from the screening group and 2387 from the control group. The outcome was 2-year change in total lifestyle score of CRC risk related lifestyle factors (smoking, alcohol consumption, physical activity, diet and BMI).

Results
Preliminary results indicate that total lifestyle scores improved likewise in the screening group and in controls suggesting favourable changes for CRC risk in both groups. There was no difference by participation, either: the change in score did not differ in those participating screening compared to those invited, but not participated screening.

Conclusions
Present study found no unfavourable changes in total lifestyle in the studied age group after CRC screening. However, lifestyle counselling could be included in screening setting.

Key messages:
- Invitation or participation to colorectal cancer screening was not found to have a adverse effect on colorectal cancer risk related lifestyle in a population-based survey study in Finland
- Potential lifestyle change after colorectal cancer screening should be evaluated programme-wise. In Finland, this does not affect the cost-benefit ratio of the colorectal cancer screening programme
Mammography screening program in Austria. Survey

Results

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Background

In 2014 a mammography screening program was implemented in Austria. Ever since then, women between 45 and 69 years are actively invited in a two year period to participate in the program; women at the age of 40+ and 70+ can opt in. Certified radiology institutes with appropriate experience, staff and a double-check system of the diagnostic result provide the mammography screening directly without a referral from a physician.

Our study focused on gathering information concerning the level of knowledge about facts of breast cancer screening by the female staff of the Austrian Social Security Institutions.

Method

We developed an online-survey containing 18 questions that was sent to 15.035 female colleagues within the Social Security Institutions in Austria. The survey was conducted in January/February 2016.

Results

4.270 women answered the survey, which means a response rate of 28%.

The questions about definitions of screening, breast cancer screening, test accuracy of mammography and general questions about the program were answered correctly by 70-90% of the respondents.

Estimations about the incidence and mortality rate of breast cancer and overdiagnosis due to screening were answered correctly by 40-50% of the respondents.

7% of the respondents estimated the false positive rate within 10 years correctly, the age-of-highest-benefit was estimated correctly by 10% of the respondents.

Conclusions

The level of information about the breast cancer screening program is quite high within the Social Security Institutions in Austria but overestimation of screening benefits and underestimation of screening harms are quite common.

The benefits and harms of breast cancer screening should be communicated in a more understandable way to women in order to enable them to decide prudently.

Key messages:

- About half of the respondents are aware of overdiagnosis in breast cancer screening
- Only 1 out of 14 women is informed of false positive rates and 60% of the respondents overestimate the reduction in mortality due to participating in the breast cancer screening

Efficient gastric cancer prevention through serum pepsinogen and helicobacter antibody testing

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Issue

Promoting gastric cancer prevention, i.e., achieving increased participation in cancer screening within the general population is an important task of municipal public health authorities in Japan. Upper gastrointestinal series (UGI) participation rates have hitherto been low.

Description of the study

The study aims to clarify the effect and economic efficiency of gastric cancer risk screening for inhabitants who had not previously undergone a UGI. In Machida City (430 thousand population), risk screening was introduced in Fiscal Year (FY) 2014. Participation in risk screening and the outcomes (fiber gastroscope [FGS] referral and results) were analysed by UGI participation history, which included regular participation (undergoing a UGI every year, in the recommended periods); irregular participation; and no participation (not undergoing a UGI for 3 years).

Results

In FY2014, 25,808 inhabitants (mean age 62.6 years, male 37%) participated in the risk screening. The risk screening participation rate in the targeted population was 15.9%, significantly higher than that of UGI (1.8%–2.1%). A total of 9,486 participants were recommended for FGS, and 7,196 underwent the procedure. Gastric cancer was detected in 139 participants. The detection rates for screening participants (regular-participants: 0.19%, irregular-participants: 0.63%, no-participants: 0.43%) were significantly higher than that of UGI (0.09%–0.12%). The cost-effectiveness ratio of expenses per cancer detection was 5,691 thousand JPY (50.1 thousand EUR, FY2013) for UGI and 870 thousand JPY (7,650 EUR) for risk screening, and the incremental cost-effectiveness ratio of introducing risk screening was 764 thousand JPY (6,720 EUR) per life saved.

Lessons

Risk screening improves the convenience of participating in gastric cancer prevention. This simple, economically efficient screening method will contribute to gastric cancer prevention in East Europe, where gastric cancer has increased recently.

Key messages:

- Gastric cancer risk screening significantly improves cancer prevention among those who have not regularly or never undergone a UGI
- Serum pepsinogen and helicobacter antibody testing increases cancer detection rate and is demonstrated to be more cost-effective than UGI for gastric cancer screening within the general population

Determinants of general practitioner’s cancer related gut feelings – a prospective cohort study

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Background

General practitioners (GPs) use gut feelings to diagnose cancer in an early stage, but little is known about the predictive value of gut feelings and how this is influenced by patient and GP characteristics.

Methods

Prospective cohort study of patients in 44 general practices throughout the Netherlands, from January 2010 till December 2013. GPs completed a questionnaire regarding gut feelings, patient and GP characteristics, if they noticed a cancer-related gut feeling during patient consultation. Follow-up questionnaires were sent 3 months later requesting information about the patient’s diagnosis. Chi-square, uni- and multivariate logistic regression and multilevel analyses were performed.

Results

A gut feeling (N = 366) is most often triggered by weight loss (24%, N = 85) and rare GP visits (22%, N = 76), but none of the triggers were predictive of cancer in a multivariate analysis except for patient’s (P = 0.01) and doctor’s age (P = 0.04). Most GPs (95%) acted immediately on the gut feeling, either referring to a specialist or by performing additional medical tests. The average positive predictive value of cancer related gut feeling was 35%. This increases with 2% for every year a patient becomes older, and with 3% for every year a GP becomes older.

Conclusions

GP’s gut feeling for cancer proves to be a useful tool in diagnosing cancer and its relative high predicting value increases
Colorectal Cancer Screening in WHO European region: differences among countries by income level
Paolo Matteo Angeletti

Background
In WHO European Region colorectal cancer (CRC) is the first tumor with 471,000 new cases per year and a mortality rate of 28.2 per 100,000 population. WHO European Region is composed by 53 countries. Large-scale studies have found a considerable reduction in mortality due to the adoption of population-based screening programs with cost-effectiveness.

Methods
We consider the income level for each country referred to pro capita gross national income (current US$) as indicated by World Bank. High income: $12,736 or more divided into OECD group (Organization for Economic Co-operation and Development) and non-OECD; upper middle: from $4,126 to $12,735; lower middle: from $1,046 to $4,125. These data were implemented using available literature, single state ministerial web pages, data from Globocan 2012 and World Cancer Registry, X edition.

Results
Of the 24 high-income OECD countries, 17 (71%) have CRC organized screening, while only 6 of 10 States (60%), belonging to group high-income non-OECD countries, have an organized screening. The majority of countries with a high income are members of European Union (EU), where a 2010 European Parliament resolution invited single States to adopt the screening prevention programmes.

Of 12 States with upper-middle income just 2 (17%) have an organized screening, another 17% (no. of States=2) have internal regional differences with a substantial mix of organized and spontaneous screening, 25% (no. of States=3) have just spontaneous screening and 41% (no. of States=5) there are not evidences of screening or unknown status. Of the 7 lower-middle income States, just one has an active CRC screening programme. There is no evidence of screening activity for the other six countries.

Conclusions
The data suggest a wide inequality among different European countries. Increase of life expectancy and the progressive improvement of quality of life make reasonable a major diffusion of preventive strategies.

Key message:

Adoption of screening programmes reduces incidence and mortality of CRC. The increase of screening coverage should be a main objective of each country

Association between Mediterranean diet and gastric cancer: Results of a case-control study in Italy
Emanuele Leoncini

Methods
An association between a certain genetic polymorphisms, occupational exposures to AAs or PAHs and development of BC. Our results suggest that polymorphisms in GSTM1 and GSTT1 genes could influence risk for developing KC in individuals occupationally exposed to pesticides.

Key messages:

- development of BC is possibly associated to the variant genotypes of GSTM1, GSTT1, NAT2 and SULT1A1, occupational exposures to AAs or PAHs and development of BC.
- polymorphisms in GSTM1 and GSTT1 genes could influence risk for developing KC in individuals occupationally exposed to pesticides.
Results
We reported a reduced risk of gastric cancer for increasing adherence to Mediterranean diet (OR = 0.86; CI: 0.77-0.96). Risk estimates were consistent across strata of age and gender. With reference to single specific components of the Mediterranean diet, we also found a high consumption of fruit (OR = 0.75; CI: 0.67-0.84), vegetables (OR = 0.64; CI: 0.53-0.75) and legumes (OR = 0.87; CI: 0.66-0.98) to be significantly associated with lower risk of gastric cancer.

Conclusions
Our study showed that following a Mediterranean dietary pattern may have beneficial effects on gastric cancer risk. Data on the association between Mediterranean diet and gastric cancer risk, although scarce, are promising. Efforts towards the prevention of gastric cancer by dietary recommendations could directly lead to substantial reduction of morbidity.

Key message:
- High adherence to Mediterranean diet may be associated with gastric cancer

Methodological features of prostate cancer screening models – A review of simulation models
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Background
Although Prostate-Specific antigen (PSA) screening is currently the most used prostate cancer (PCa) screening method, its benefits are still controversial. In absence of empirical data on the lifetime consequences of screening and potential overdiagnosis, which is difficult to assess in empirical studies, mathematical models are frequently used to assess the benefit-harm balance of PSA screening. Such models differ in methodological features and provide controversial results. The goal of our study is to conduct a systematic review which will answer (1) What are the necessary features that should be included in models evaluating the benefit and harms of PCa screening? and (2) How can those affect the model-generated benefit-harm results?

Methods
We performed a systematic literature search for studies modeling the effect of PSA screening in PUBMED up to March 2016. For extracting methodological features, we applied a set of criteria based on identifying key variables or processes that a PCa screening model should have to provide a comprehensive and unbiased benefit-harm evaluation.

Results
We identified 41 articles based on 28 models. 24 of those used a stage-shift approach to model the screening effects. Health-related quality of life (HRQOL) was considered in nine models. Six of the models explicitly modeled the preclinical phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis. Nine models validated the clinical incidence, stage distribution at screening phase and only ten models controlled for overdiagnosis.

Conclusions
PCa screening models differ in important methodological aspects. Understanding the consequences of using some features will enable easier interpretation of the results and improvement in future modeling.

Key messages:
- Methodological features of prostate cancer screening model affect the predicted benefit-harm balance of screening
- Prostate cancer screening model should account for overdiagnosis and HRQOL

The burden of rare cancer among adults in Austria, 2000-2012
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Background
Burden of rare cancer is seldom studied, although in Europe rare cancers represent about 22% of all newly diagnosed cancers each year.

Methods
All malignant cancer cases diagnosed in 2000-2012 in patients aged ≥15 years were derived from the Austrian National Cancer Registry and classified according to the RARECARE entities (65 first and 218 second-layer entities, version December 2015). Cancers showing an average annual crude incidence rate <6/100,000 in 2000-2012 were defined as rare. Relative survival was calculated for 2000-2004 and 2005-2009 based on follow-up until December 31st 2014. Reference date for prevalence was December 31st 2012.

Results
Each year about 7 000 rare cancers were diagnosed, which is 18% of all newly diagnosed cancer cases per year. 84% of all second-layer entities (183) were rare, 13 entities were not observed, and 2 entities (epithelial skin tumours) were not collected. Rare haematological, digestive, and head and neck cancers were most common comprising 57% of all rare cancers. Five-year relative survival remained stable in 2000-2009 at 53% for all rare cancers, varying from 22% (digestive cancers) to 93% (male genital cancers). 60 000 patients with a rare cancer were alive at the end of 2012 (19% of total cancer prevalence).

Conclusions
In Austria, almost one in six cancer cases among adults is a rare cancer. This is in line with the European results. Taking into account that this group consists of at least 183 different entities indicates the challenge that health care faces. Therefore increased awareness among clinicians and policy makers is needed, leading to improvement of diagnostics and treatment by (inter)national cooperation and concentration of care. Preferably, the next national cancer plan should focus on rare cancer.

Key messages:
- 18% of all newly diagnosed cancer cases per year are rare cancers among adults in Austria
- 183 different rare cancer entities indicate a big challenge for clinicians and policy makers

Personalized prostate cancer screening accounting for individual risk factors and preferences
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Background
The benefit-harm balance of prostate cancer (PCa) screening is influenced by individual risk factors, preferences, and specifics of the applied screening algorithm. We used the ONCOTYROL Prostate Cancer Outcome and Policy (PCOP) model to identify optimal screening strategies with respect to individual family history, age, disutility weighting, and life-shortening co-morbidity.

Methods
The PCOP model is a state-transition micro-simulation model simulating the consequences of PCa screening and treatment on duration and quality of life. Evaluated strategies included no screening, one-time screening at different ages, and interval screening at different intervals and age ranges followed by immediate treatment. Sensitivity analyses were used to identify strategies maximizing quality-adjusted life expectancy (QALE) for each combination of individual risk factors and disutility weighting. Screening was also evaluated in combination with biennial active surveillance (AS) delaying treatment of localized cancer until progression to Gleason score ≥ 7.

Results
In men without elevated familial PCa risk, no screening was the preferred strategy, independent of age, disutility weighting and life-shortening co-morbidity. In contrast, men with elevated familial risk gained QALE depending on their risk and preference constellation. Optimal screening strategies varied as well. AS improved the benefit-harm balance of some screening strategies. However, strategies gaining the most QALE in men with familial risk gained less when combined with AS.

Conclusions
Based on our model assumptions, PCa screening is beneficial for men with familial predisposition only. However, benefits of screening depend on individual risks and preferences. AS may reduce benefits of screening, when gains by averted overtreatment are outweighed by losses due to delayed treatment.

Key messages:
- PCa screening may be beneficial for men with elevated familial PCa risk, but not for men with average PCa risk
- Decisions on PCa screening should incorporate individual risks and preferences

Effects of health-prone behavior concerning breast cancer on blood pressure control in hypertensives
Naomi Miyamatsu

Background
A specific health-prone behavior, such as individual frequency of breast cancer screening, may affect other aspects of subsequent health status, such as blood pressure control. If it is assumable, intervention to a specific health behavior may change other aspects of health status.

Methods
This study was conducted as sub-analyses of intervention study regarding public education for breast cancer screening. Participants for analyses were 738 hypertensives (SBP > =140 or DBP > =90, or on anti-hypertensive) at baseline survey in 2012. They were divided into three groups by history of breast cancer screening, never [reference group], irregular, and regular; with annually/biennially check-up at baseline. Better control of blood pressure was defined as SBP<140 and DBP<90 at follow-up survey in 2014. Logistic regression analysis was performed to estimate odds ratios [ORs] and 95% confidence intervals [CIs] of better control of blood pressure by history of breast cancer screening adjusting for age, BMI and SBP at baseline and w/o public education. Similar analysis was performed to estimate the effect of intervention about public education regarding breast cancer screening on blood pressure control.

Results
At baseline, SBP of each group did not have significant difference; 144.9±17.6 mmHg for ‘never’ group, 143.7±15.3 for ‘irregular’ and 141.4±16.5 for ‘regular’ (p=.11). Proportions of better control of blood pressure at follow-up survey were 43%(164/382) for ‘never’ group, 44%(95/214) for ‘irregular’, and 59%(83/142) of ‘regular’. Multivariate adjusted OR(95%CI)s of better control of blood pressure were .98(68.1-1.42) for ‘irregular’ and 1.67(1.09-2.57) for ‘regular’. Any significant effect of public education about breast cancer screening on blood pressure control was not observed.

Conclusions
Health-prone behavior in cancer screening affected subsequent blood pressure control. However, two years public education of cancer screening did not have an impact on them.

Key messages:
- Health-prone behavior of cancer screening affected subsequent blood pressure control
- Short-term public education of cancer screening did not have an impact on blood pressure control

Regional lung cancer incidence trends in Croatia: emergency for public health intervention
Marina Polic-Vizintin

Background
Recent data show that more than one quarter of adult inhabitants of Croatia are everyday smokers. The aim of this study was to determine trends of trachea and lung cancer incidence in Croatia, Zagreb and Split-Dalmatia County (SDC) and compare them between regions, to stress importance of comprehensive tobacco control program.

Methods
Incidence data for the period 2001 – 2013 were obtained from the Croatian National Cancer Registry and European Health for All Database. For calculating incidence rates per 100,000
persons we used Censuses from years 2001 and 2011. Age-standardized rates of lung cancer incidence were calculated by the direct standardization method using the European Standard Population. To describe incidence trends we used joinpoint regression analysis.

Results
Lung cancer incidence rates in men show declining trend. Joinpoint analysis showed a significant decrease in the incidence for all regions, with estimated annual percentage change (EAPC) for Zagreb of -4.3%, for Croatia of -2.3%, and for SDC of -1.6%. In women there is an increasing trend. Joinpoint analysis showed a significant increase in the incidence for Croatia with EAPC of 1.6%. There was no significant increase for Zagreb and SDC. In terms of both sexes, joinpoint analysis showed a significant decrease in age-standardized incidence rates for Croatia with EAPC of -1%. There were no significant results for SDC and Zagreb.

Conclusions
This study shows there is an increase in female lung cancer incidence rate and a decrease in male lung cancer incidence rate. Those findings correlate with decreasing trend of smoking prevalence among men and increasing trend among women. Despite all of that, Croatia is still among the European countries with the highest lung cancer incidence. These Results stress importance of smoking prevention and cessation policies especially among women and young people.

Key messages:
- Croatia is among the EU countries with the highest lung cancer incidence
- That raises question about introducing screening in high-risk population and comprehensive tobacco control program