



International Association of Cancer Registry
annual conference

Ensuring quality and use of data from
cancer registries in the 21st century

the 39th annual
scientific meeting of the
IACR is sponsored by:



PROVINCIE **UTRECHT**





Ensuring quality and use of data from cancer registries in the 21st century

17-19 October 2017

Jaarbeurs Supernova

Utrecht, The Netherlands

39th
annual scientific
meeting

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About



The International Association of Cancer Registries (IACR) was founded in 1966 as a professional society dedicated to fostering the aims and activities of cancer registries worldwide. It is primarily for population-based registries, which collect information on the occurrence and outcome of cancer in defined population groups (usually the inhabitants of a city, region, or country). For each new cancer case, registries record details of the individual affected: the nature of the cancer, information on treatment, and on follow-up especially with respect to survival from the disease.

Registries play an important role in research into the cause of cancer, both by providing data on patterns and trends, and in different types of epidemiological studies (in particular, in their ability to follow up groups of persons exposed to potential hazards). Registries are an essential element in the planning and monitoring of cancer control strategies, and in identifying priorities in public health.

To ensure that cases are properly recorded, and that the statistical data gathered are complete and can be used to make valid comparisons, cancer registries must conform to accepted working practices and standards. The IACR was created to foster the exchange of information between cancer registries internationally, with the goal of improving the quality of data and comparability between registries.

The IACR is a non-governmental organization that has been in official relations with the World Health Organization since January 1979. More information can be found at www.iacr.com.fr

Belgian Cancer Registry



The Belgian Cancer Registry is a young, population based registry that covers the entire country (11 Mio) since 2004 and relies on two pathways: oncological care programs and pathology laboratories. It has a legal basis to use the national registration number which allows accurate linkage and follow-up. Detailed information about diagnostic and therapeutic procedures (incl. drugs) is obtained through linkage with administrative and clinical data bases for an active involvement in quality of care studies and evaluation of screening programs. By bundling resources in a national network, the Belgian Cancer Registry aims to provide a qualitative and quantitative added value in cancer registration both on a national and an international level. More information can be found at www.kankerregister.org.



The Netherlands Comprehensive Cancer Organisation (IKNL) was founded in 2011, following a merger of 9 regional cancer centers. IKNL is the quality institute for oncological and palliative research and practice. IKNL collaborates with healthcare professionals, managers and patients on the continuous improvement of oncological and palliative care. One of the main tasks of IKNL is The Netherlands Cancer Registry (NCR).

Since 1989 the Netherlands Cancer Registry (NCR) gathers information about every patient with cancer; in the near future IKNL expands the tumour-specific dataset. More data will also be gathered about the course of the disease, thus making the NCR a continuous patient follow-up system. More information can be found at www.iknl.nl

IACR 2017 in Utrecht: A welcome message

The cancer registries of Belgium and the Netherlands, namely the Belgian Cancer Registry (BCR) and the Netherlands Cancer Registry under the Netherlands Comprehensive Cancer Organisation (IKNL) came together to jointly host and co-organise with the International Association of Cancer Registries (IACR) the 39th edition of its Annual Scientific Conference in Utrecht, the Netherlands.

The IACR Annual Scientific Meeting has been held regularly since 1970, and annually since 1982. Hosted on a different continent each year, the IACR annual conference attracts an average of 200 delegates and offers a rich programme on topics related to the impact of cancer (incidence, survival), the evaluation of cancer screening and treatments, the aetiology of different cancers, and many others.

The theme of this year Conference is “Ensuring Quality and Use of Data from Cancer Registries in the 21st Century”. We were pleased to attract presenters and speakers who will discuss issues and directions for the future following the conference’s plenary themes: cancer surveillance for cancer control, the role of cancer registries in prevention and screening programmes, the role and integration of cancer registries in clinical outcomes, analysing, presenting and communicating cancer registry data and cancer registries and ‘big data’.

Prior to the scientific conference, some of the participants will have a chance to attend any of two pre-conference workshops that will deliver focused lectures and discussions that will be of great benefit to registry professionals: Staging and Essential TNM and Cancer Predictions.

It is also a great pleasure to be working with the European Network of Cancer Registries (ENCR) as they are actively involved in this year’s conference and will be holding the ENCR-JRC Symposium and ENCR General Assembly on 19 October as a satellite symposium to IACR 2017.

The Association is grateful to its membership and our dedicated partners in Europe for this year’s meeting and for gathering greater participation from experts and professionals from the region.

We look forward to a very rich exchange of information, ideas, future strategies that, as we always hope, will lead to greater cooperation and collective action on cancer control.

Dr Roberto Zanetti, President
IACR

Prof. dr Sabine Siesling
Netherlands Cancer Registry

Dr Liesbet Van Eycken
Belgian Cancer Registry



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Committees

Local Organizing Committee (LOC)

- Sabine Siesling, Netherlands Cancer Registry, The Netherlands
- Liesbet Van Eycken, Belgian Cancer Registry, Belgium

Other members of the local organizing committee

- Valery Lemmens, NCR
- Jan Maarten van der Zwan, NCR
- Rob Verhoeven, NCR
- Nelleke van Dijk, NCR
- Harlinde De Schutter, BCR
- Katia Emmerechts, BCR
- Kris Henau, BCR

Programme Committee

- Freddie Bray, IACR Executive Secretary
- Liesbet Van Eycken, BCR
- Tomohiro Matsuda, IACR President-Elect
- Les Mery, IARC and GICR
- Stefano Rosso, IACR Treasurer
- Harlinde De Schutter, BCR
- Rob Verhoeven, NCR
- Otto Visser, NCR
- Roberto Zanetti, IACR President

IACR Executive Board and Secretariat

- Roberto Zanetti, President
- Tomohiro Matsuda, IACR President-Elect
- Freddie Bray, Executive Secretary
- Stefano Rosso, Treasurer
- Les Mery (IARC)
- Chelle Fernan (IARC)

IACR Regional Representatives

- Africa: Mohamad Hsairi
- Central and South America: Enrique Barrios
- North America: Donna Turner
- North America: Kevin Ward
- Asia: Sultan Eser
- Asia: Rajesh Dikshit
- Europe: Anna Gavin
- Europe: Elisabete Weiderpass
- Oceania: Joanne Aitken





The Enrico Anglesio Prize

Fondo Anglesio Moroni
www.anglesiomoroni.org

Fondo Anglesio Moroni (Turin, Italy) awards several Prizes every year, one of which at the annual conference of the International Association of Cancer Registries (IACR). The Enrico Anglesio Prize recognizes a young researcher working in a cancer registry or epidemiology centre for original scientific research in cancer epidemiology.

To date, seven IACR-round Prizes were awarded:

- In 2016 to Lidia Sacchetto (Italy): In situ, thin and thick melanoma in Europe: how and where are they increasing?
- In 2015 to Hanna Tervonen (Australia): Cancer survival and summary stage among Aboriginal and Torres Strait Islander people in NSW
- In 2014 Clara Castro (Portugal): Predicting cancer incidence in the north of Portugal for the years 2013, 2015 and 2020
- In 2013 to Iman Meziane (Morocco): The Moroccan Breast Cancer Registry (MBCR): Assessment of Breast Cancer Risk in Morocco
- In 2012 to Susan Spillane (Ireland): Use of the anti-diabetic drug metformin and disease spread at diagnosis in colorectal cancer
- In 2011 to Mugi Wahhidin (Indonesia): Methods of population-based cancer registry in Indonesia
- In 2010 to Yuri Ito (Japan): Trends in cure fraction for colorectal cancer in Osaka, Japan, between 1975 and 2000

The Enrico Anglesio Prize will be awarded again this year at the 39th IACR annual conference.

To be eligible, candidates must be under 35 years of age and be the first and presenting author of the abstract selected for oral presentation. The abstract will cover original research which has not been presented elsewhere.

The Jury, appointed by the Fondo, will evaluate candidates based on the following criteria:

- Clarity and inciveness of the oral presentation
- Originality and relevance of the scientific work
- Quality of the abstract
- Curriculum of the candidate

Prize money is €500,-. It is doubled to €1000,- if the research is published within one year in a journal with impact factor between 2.00 and 4.00. It is further raised to €1500,- if the journal has an impact factor over 4.00. The Enrico Anglesio Prize must be acknowledged in the article.

The award ceremony will take place at the end of the IACR conference.

Enrico Anglesio Prize jury pool:

Steffano Rosso (President)
Harry Comber
Betsy Kohler
Tomohiro Matsuda
Sabine Siesling
Liesbet Van Eyken

Programme at a glance

monday, october 16 | pre conference

09:00 - 17:30	PRE CONFERENCE ACTIVITIES
18:00 - 21:00	WELCOME RECEPTION (SEE PAGE 10)

tuesday, october 17 | day 1

09:00 - 09:30	OPENING
09:30 - 10:15	CLEMMESSEN LECTURE: JACK SIEMIATYCKI
10:15 - 10:40	KEYNOTE 1: ISABELLE SOERJOMATARAM
10:40 - 11:00	COFFEE BREAK
11:00 - 12:30	PARALLEL SESSION 1
12:30 - 14:00	LUNCH POSTER SESSION
14:00 - 15:30	PARALLEL SESSION 2
15:30 - 15:50	COFFEE BREAK
15:50 - 17:30	PLENARY SESSION 1

wednesday, october 18 | day 2

09:00 - 9:25	KEYNOTE 2: JOHAN MACKENBACH
09:25 - 10:40	PLENARY SESSION 2
10:40 - 11:00	COFFEE BREAK
11:00 - 12:30	PARALLEL SESSION 3
12:30 - 14:00	LUNCH POSTER SESSION
14:00 - 15:30	PLENARY SESSION 3
15:30 - 15:50	COFFEE BREAK
15:50 - 17:30	PARALLEL SESSION 4
18:00 - 23:30 PM	SOCIAL PROGRAMME (SEE PAGE 10)

thursday, october 19 | day 3

09:00 - 9:30	KEYNOTE 3: KARIN HAUSTERMANS
09:30 - 10:15	PLENARY SESSION 4
10:15 - 10:40	KEYNOTE 4: KEVIN WARD
10:40 - 11:00	COFFEE BREAK
11:00 - 12:15	IACR BUSINESS MEETING
12:15 - 12:30	PRIZING AND CLOSING
12:30 - 14:00	LUNCH POSTER SESSION
14:00 - 18:00	EUROPEAN NETWORK OF CANCER REGISTRIES SATELLITE SYMPOSIUM: open to all IACR registered

Meeting rooms

Transitzone →



Progress →



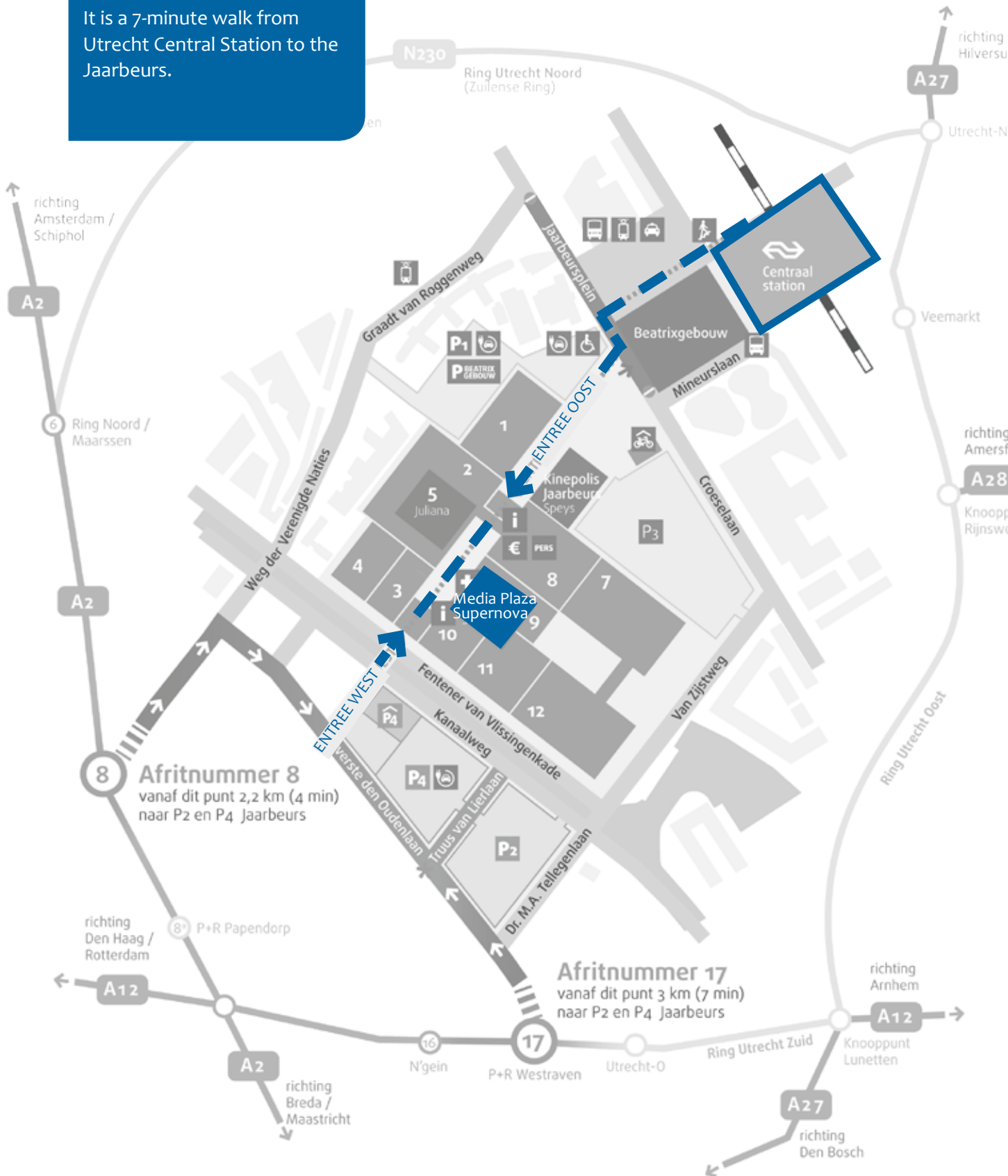
Quest →



MEDIA PLAZA | SUPERNOVA

Jaarbeurs Utrecht
Jaarbeursplein
3521 AL Utrecht

It is a 7-minute walk from
Utrecht Central Station to the
Jaarbeurs.



Practical information

CONFERENCE LOCATION

The Jaarbeurs Utrecht will be the venue for the 39th IACR Annual Meeting. It will host all meetings and the poster display. Please see the venue map for meeting room locations.



It is a 7-minute walk from Utrecht Central Station to the Jaarbeurs.

Address

Jaarbeurs Utrecht,
Media Plaza Supernova (see map page 8)
Jaarbeursplein
3521 AL Utrecht

On Monday Workshop 1 and the IACR Board of Directors Meeting will be held at the IKNL office.

Address:

*IKNL Utrecht (see map on the back of the book)
Godebaldkwartier 419, entrance Janssoenborch
8th floor
3511 DT Utrecht*



ON-SITE REGISTRATION

The registration and information desk is located in the Transit Zone at the Media Plaza Supernova of the Jaarbeurs. Name badges will be provided in your registration package which can be picked up at the registration and information desk.

Registration times

Monday, October 16th – 8:00 am – 5:30 pm
Tuesday, October 17th – 8:00 am – 5:30 pm
Wednesday, October 18th – 8.30 am – 5:30 pm
Thursday, October 19th – 8.30am – 5.30 pm



CERTIFICATE OF ATTENDANCE

Certificates of attendance can be picked up at the registration and information desk.



OFFICIAL LANGUAGE

The official language for the presentations will be English. No interpreting will be provided.



ACCES TO INTERNET

Delegates will have access to wireless internet at the conference.
Name network: MediaPlaza-Supernova-hotspot



SOCIAL MEDIA

Twitter: #IACR39



APP

Follow these steps to download the conference app:

1. Download the Guidebook app from the Google Play Store or the App Store
2. Create an account
3. Open the app and choose 'Enter Passphrase'
4. Enter 'iacrutrecht' and download the Conference Guide
5. Enjoy

Social programme

MONDAY, OCTOBER 16

IACR WELCOME RECEPTION

6:00 pm - 9:00 pm
Hofman Café
Janskerkhof 17^a
3512 BM Utrecht

1



WEDNESDAY, OCTOBER 18

CANAL CRUISE

6:00 pm - 7:00 pm
address of departure: Viebrug
Oudegracht 85
3511 AD Utrecht

2

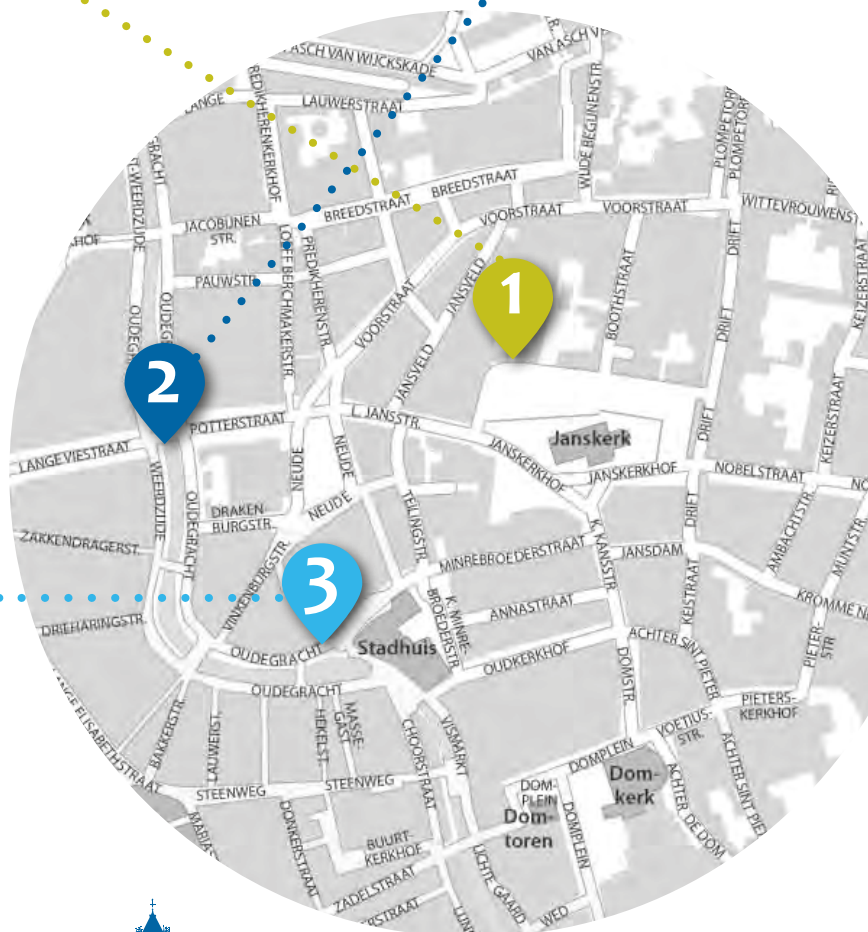


WEDNESDAY, OCTOBER 18

IACR SOCIAL DINNER

7:00 pm - 11:30 pm
De Winkel van Sinkel
Oude Gracht 158
3511 AZ Utrecht

3



Information for presenters

ORAL PRESENTATIONS

- The allocated time for each presentation is 10 minutes followed by a 5 minute discussion (unless otherwise specified). All speakers are asked to keep to the allocated time.
- Presentations should be in PowerPoint format and presented in English.
- Speakers are required to submit their presentation to verify that the file is in working order. To do so, they should: * Preferably, send their presentation to iacr2017@iknl.nl before October 16th.

* Otherwise, go to the registration and information desk at the Jaarbeurs venue with your presentation on a USB memory stick at least 2 hours before the start of the session.

POSTER PRESENTATIONS

- **Format/Size:** Posters should be in portrait format, with a size of A0 (119 x 85cm).
- **Installation and removal of posters:**
 - Posters should be installed between 8.00 and 9.00 hours on October 17th.
 - Install your poster at the designated place. All posters have been numbered (numbers can be found in the abstract book and all poster presenters have received a list of poster numbers).
 - It will not be possible to install the poster on October 16th.
 - Posters can be removed between 13.30 and 18.00 hours on October 19th.
 - All posters that are not removed before 18.00 hours on October 19th will be removed by the organization.
- **Viewing of the posters will be on:**
 - Morning coffee break
 - Lunch break
 - Afternoon coffee break

Each poster presenter is expected to be in attendance for discussion of their poster during the poster viewing schedules listed above. Please see the final conference programme for exact timing of the breaks and lunches.

POSTER AWARDS

- The three best posters will be awarded during the closing ceremony.
- Scientific content as well as communication skills will be judged by a jury selected by the IACR 2017 Programme Committee:
 - Dr Rama
 - Dr Katanoda
 - Dr Visser
 - Mr Ferlay

Workshop 1: Staging and essential TNM

Information

Monday, October 16
09.00 hrs – 16.30 hrs
IKNL Meeting Hall

OBJECTIVES

- Revisit principles and challenges in cancer staging, highlighting major differences among existing systems.
- Get acquainted with CanStaging Tool, Essential TNM and Pediatric Cancer Staging

PROGRAMME

1. Staging - Generalities
 - Introduction to staging
 - Staging systems in cancer registries
 - SEER Summary Staging
 - TNM Staging: UICC (new aspects in the 8th edition of UICC), Differences UICC - AJCC, ENCR Condensed TNM
2. Challenges/ solutions to improve staging information in C Registries (Invited presenters from the audience B. Edwards, G. Chesumbai)
3. Proposals to overcome difficulties in staging in cancer registries
 - CanStaging Tool
 - Pediatric Cancer Staging
 - Essential TNM
 - Breast Cancer (Theory / Practice)
 - Cervix Cancer (Theory / Practice)
 - Colorectal Cancer (Theory / Practice)
 - Prostate cancer (Theory / Practice)



Faculty

MAX PARKIN

Parkin University of Oxford, UK

Dr Donald Maxwell (Max) Parkin graduated in medicine from Edinburgh University in 1968. After initial specialisation in internal medicine - gastroenterology, he transferred to public health/epidemiology in 1973. After working in UK, mainly in health service information and planning, he moved in 1981 to the International Agency for Research on Cancer (IACR - WHO) in Lyon, France, as head of the Descriptive Epidemiology Unit, until October 2004.

Currently, his activities are:

- Visiting senior research fellow, Clinical Trials Service Unit and Epidemiological Studies Unit, Oxford University, UK¹.
- Senior Epidemiologist, Wolfson Institute of Preventive Medicine (Queen Mary University, London)².
- Head of Cancer Prevention Programme, International Network for Cancer treatment and Research (INCTR)³. The main activity since 2011 has been the establishment of the African Cancer Registry Network (AFCRN), a consortium of population based registries providing a regional hub for the development and improvement of cancer statistics in sub Saharan Africa.
- Senior Visiting Scientist, International Agency for Research on Cancer (Lyon). Since September 2012, in order to coordinate the activities of the AFCRN project with the wider goals of the Global Initiative for cancer Registration
- Foreign Adjunct Professor, Karolinska Institute
- Dr Parkin is a member of the editorial board of several international journals and holds honorary professorships at the Universities of Peking (Beijing) and Tianjin, China. He has published extensively, with more than 400 papers and reviews in the international scientific literature, mainly on descriptive epidemiology (international cancer patterns and trends), with a major concern for cancer registration, and in cancer prevention and control (especially the effectiveness of cancer screening).

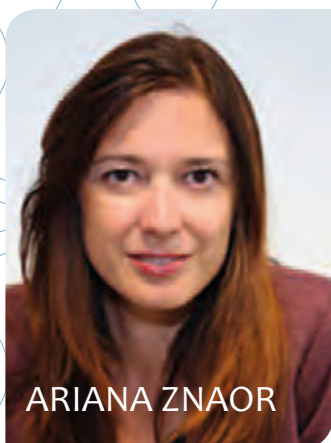


MARION PIÑEROS

Section of Cancer Surveillance, IARC

Marion Piñeros is a medical doctor from the Universidad el Rosario in Colombia and master of Public Health from the London School of Hygiene and Tropical Medicine in London. Before working at the International Agency for Research on Cancer she worked for one year at the Programme for Action on Cancer Therapy (PACT) from the International Agency of Atomic Energy (IAEA) and fourteen years at the National Cancer Institute in Colombia.

Her main interest has been the production, dissemination and use of information for cancer control. She has advocated for a clear understanding among stakeholders of the role of PBCR in cancer surveillance and is interested in the best ways of delivering technical assistance for cancer registry development, as well as contributing to descriptive epidemiology studies of cancer in different areas. She works with the IARC Regional Hub for Cancer Registration in Latin America.

**ARIANA ZNAOR**

Section of Cancer Surveillance, IARC

Ariana Znaor is a scientist at the Cancer Surveillance Section at IARC. Within the Global Initiative for Cancer Registry Development (GICR), she is responsible for coordination of the Regional Hub for Cancer Registration in Izmir (covering Northern Africa, Central and Western Asia).

Before joining IARC in 2013, Dr Znaor was the director of the Croatian National Cancer Registry for 13 years, as well as associate professor of epidemiology at the Andrija Stampar School of Public Health, Zagreb. She completed her MD, MSc and PhD degrees at the University of Zagreb, Croatia. Her areas of expertise are cancer registration and epidemiology.

Workshop 2: Cancer predictions

Information

Monday, October 16
9.00 hrs – 16.30 hrs
Jaarbeurs Utrecht, Super Nova, Quest room

PROGRAMME

- Introduction and welcome
- Overview of trends, AP/AC models
- Modelling rates using factor models for time and introducing splines.
- Practical 1 – interpreting trends and parameters of Poisson models.
- Extending to APC models.
- Intro to projections. Why projections needed?
- Extending models for projection (assumptions, reflecting uncertainty, sensitivity to assumptions)
- Practical 2 – Comparison of projection approaches, understanding assumptions.



Faculty

MARK RUTHERFORD

Department of Health Sciences at the University of Leicester, UK

Mark Rutherford is a lecturer in Biostatistics at the University of Leicester's Department of Health Sciences. Mark holds a visiting scientist position at IARC's Section of Cancer Surveillance, working on Phase 2 of the International Cancer Benchmarking Partnership project. His main areas of research relate to cancer epidemiology, with particular interest in methods for reporting cancer survival metrics and modelling cancer incidence. Mark has co-authored papers on methods for projecting cancer incidence using age-period-cohort models and has also written Stata software to implement the modelling approaches. His PhD thesis was also focussed on methods for projecting cancer prevalence; combining up-to-date and projected estimates of cancer incidence and survival.

PAUL LAMBERT

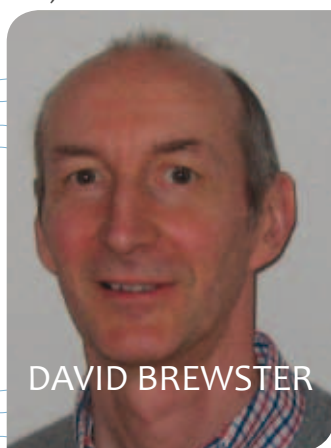
Department of Health Sciences at the University of Leicester, UK

Paul Lambert is Professor of Biostatistics in the Department of Health Sciences at the University of Leicester. Paul also works at the Department of Medical Epidemiology and Biostatistics at Karolinska Institutet (30% FTE). Paul's main research interest has been in developing methods for modelling relative survival. In particular modelling time-dependent covariate effects, incorporating period analysis in statistical models, and the estimation and modelling of 'cure' in population-based cancer studies. He is particularly keen on the use of flexible parametric survival models for both standard and relative survival. These offer a number of advantages in terms of communication of results, for example quantifying absolute levels of risk as well as relative effects. He has developed a number of commands Stata, for example to fit cure models for relative survival (strsmix and strsnmix) and also flexible parametric models (stpm2). Paul is coauthor of the book Flexible Parametric Survival Analysis Using Stata: Beyond the Cox Model.

Honorary members

David Brewster

graduated in medicine from the University of Bristol in 1981, moving subsequently to Scotland. After nine years of clinical practice, he entered postgraduate training in public health medicine. In 1995 he was appointed Consultant in Public Health Medicine and Director of the Scottish Cancer Registry and he worked in this role until his retirement from the National Health Service in May 2017. He was also appointed as Honorary Clinical Senior Lecturer in the Centre for Population Health Sciences at the University of Edinburgh in March 2000. For many years, he was a member of the Scottish Cancer Taskforce, and he contributed to a variety of national reports, including Scottish Intercollegiate Guidelines Network (SIGN) cancer guidelines. In the past, he served on the steering committee of the European Network of Cancer Registries (including as chairman), the executive board of the International Association of Cancer Registries, and the editorial boards of the European Journal of Cancer and the International Agency for Research on Cancer monograph, Cancer Incidence in Five Continents, volume X.



Eero Pukkala

(in the picture with grand-daughter Minttu) is Director for Research of the Finnish Cancer Registry, Institute for Statistical and Epidemiological Cancer Research, Helsinki; and Professor of Epidemiology at the Faculty of Social Sciences, University of Tampere.

He is author of more than 650 peer-reviewed epidemiological publications, including studies on cancer and other health outcomes related to occupational hazards; physical and social environment, and life habits; biological risk factors of cancer; familial clustering of cancer; evaluations of the effects of screenings and other interventions; studies on factors affecting survival of cancer patients; cancer predictions; cancer atlases; publications on register and biobank data quality; and privacy issues.

Eero is leader of the study network “Nordic Occupational Cancer (NOCCA)” with a focus on broad selection of work-related hazards, and study series with specific studies such as “North-European Studies on Cancer among Airline Personnel (NoES-CAPE)”; team leader of the Familial Cancer Epidemiology Group of the Finnish Centre of Excellence in Cancer Genetics Research (CoECG). He is coordinator or national principal investigator in tens of international research projects; and method developer for projects on mapping of cancer-related phenomena in all North-European countries and selected other regions in Europe, America and Asia. He has been the European representative in the Executive Board of the International Association of the Cancer Registries with special interest in getting opinions of silent IACR members heard. He is the Epidemiologist of the year in Finland nominated by the Finnish Epidemiological Society.

Eero has been course leader or main teacher of international educational programmes organised, e.g., by the IARC; International and Nordic Associations of Cancer Registries; Nordic School for Public Health; and Nordic Institute for Advanced Training in Occupational Health (NIVA). He is frequently seen as invited speaker in international congresses on cancer or epidemiology.



scientific programme



Prof. Jack Siemiatycki

A former National Health Research Scientist of Health Canada's National Health Research and Development Program and Distinguished Scientist of the Medical Research Council, Dr. Siemiatycki has held a Canada Research Chair since 2001. He has served on over 100 national and international expert advisory bodies such as: Health Effects Committee of International Joint Commission (Canada-US), Board of Directors of the National Cancer Institute of Canada, Scientific Council of the International Agency for Research on Cancer, Scientific Council of the Institut de recherche en santé publique (France), Institute Advisory Board of CIHR Institute of Circulatory and Respiratory Health, FRSQ Advisory Committee on Ethics and Databanks, Board of Directors of the American College of Epidemiology, President of the Canadian Society for Epidemiology and Biostatistics, and many others. He is an elected member of the Canadian Academy of Health Sciences. He has served on editorial boards of journals such as the American Journal of Epidemiology and has served on many grant review panels.

Research

Dr. Siemiatycki has authored or co-authored over 150 peer-reviewed articles, 50 scientific reports, and nearly 200 presentations or posters. He has been an invited speaker at well over a hundred meetings. He has also co-authored children's books.

He has received operating grant support from all the major health granting bodies in Canada and

The Clemmesen lecture

Quebec. Most of his research has been in the area of environmental and occupational etiology of cancer, with involvement also in such issues as: health survey methodology, water quality and health, and epidemiologic methodology.

The prevention of cancer depends critically on the identification of modifiable causes of cancer. Epidemiologic research is the primary tool available to accomplish this, but there are significant methodologic obstacles. Jack Siemiatycki is known for having developed novel and influential research methods in occupational etiology of cancer, and for results concerning a wide variety of possible environmental carcinogens.

He is currently involved in ongoing analyses of case-control studies conducted in the Montreal area over the past 25 years. These include one study of 12 different types of cancer, and other studies on lung cancer, on brain cancer, on prostate cancer and on ovarian cancer. There are international collaborations in combining the Montreal data on occupational exposures and lung cancer with data from various European centres aiming to explore interactions between known carcinogens, as well as well as collaborations to explore chemical and electro-magnetic radiation in the etiology of brain cancer.

His research team invites applications from prospective students, prospective post-docs, and prospective faculty members. Training opportunities include projects to analyse the voluminous datasets that have been amassed, to conduct methodological investigations of different methods of data collection or analysis, and to undertake new investigations. There is an emphasis in this team on methodological rigour and development.



Johannes Clemmesen was a pioneer of cancer epidemiology in Denmark and founder of the Danish Cancer Registry

Keynote lecture 1

Isabelle Soerjomataram MD, PhD

Deputy Head, Section of Cancer Surveillance
International Agency for Research on Cancer
(IARC)

Isabelle Soerjomataram is a medical epidemiologist with a special interest in causes, and prevention of cancer. She received her medical degree from the University of Indonesia in 2001. Following a PhD in cancer epidemiology (2007) at the Public Health department at Erasmus Medical Centre in Rotterdam, she went to the Harvard School of Public Health as a fellow in Global Health to work on the designing the disability-adjusted life years estimation for cancer globally. She took a position at IARC in 2011 where she is currently assessing international variation of the cancer burden using mainly population-based datasets.

In addition to her research activities, she is (co) coordinating several large projects funded by various institutions including the Cancer Research UK, WCRF, and the National Cancer Institute in France. One seminal project involving over than 60 experts in France, she coordinates the estimation of the proportion of cancer attributable to all known lifestyle and environmental risk factors in France. More internationally she is leading the global estimation of attributable fraction for cancers related tobacco smoking, alcohol, obesity and also Solar UV radiation. Other projects that she leads or co-leads are cancer survival projects, in high-income and also low-and middle income settings assessing the effectiveness of the local health system as well as influence of major risk factors such as obesity.



keynote 1

Big 'population' data for cancer prevention

In this Information Age, there have been marked increases in the production and collection of data globally. With the rising cancer burden, population-based cancer registry has become a prominent data source to support national cancer control planning. Accumulated datasets over time and geographic regions have enabled a better understanding cancer as a disease, including its prevention. Yet, it has created a set of complex analytical issues slowing down the translation of this data into policy.

The presentation will highlight the increasing challenges due to the ever growing big datasets in the context of the burden of cancer worldwide. Consolidation of various population-based big datasets will be showcased as they are being used more often to assess the causes of cancer to ultimately decide on priorities in cancer prevention.

In the era of big data, the need for high quality, big population data will be stressed, together with the importance for improved integration between agencies collecting population-based data to allow crowd linkage to analyse these data for better planning, monitoring and evaluation of cancer control programmes.



keynote 2

Socioeconomic inequalities in cancer mortality: a European perspective

Socioeconomic inequalities in cancer mortality are present in all European countries, but their magnitude and development over time are highly variable. In my presentation I will give an overview of inequalities in mortality from various cancers in a large number of European countries, and will summarize the results of a series of on-going comparative studies in which we exploit these data to identify the macro- and micro-level determinants of inequalities in cancer mortality.

Keynote lecture 2

Prof. Johan Mackenbach

is Professor of Public Health and chair of the Department of Public Health at the Erasmus MC, University Medical Center Rotterdam, the Netherlands. He was trained as a medical doctor, and specialised in public health and epidemiology. His research interests are in social epidemiology, medical demography and health policy. He (co-)authored more than 600 papers in international, peer-reviewed scientific journals, as well as a number of books. He is also a former editor-in-chief of the European Journal of Public Health. He is a member of the Royal Netherlands Academy of Arts and Sciences and of the Academia Europaea, honorary professor at the London School of Hygiene and Tropical Medicine, and Honorary Fellow of the Faculty of Public Health of the Royal Colleges of Physicians of the United Kingdom. In March 2015 he received the degree of Doctor Honoris Causa at the Université catholique de Louvain (Belgium).

Keynote lecture 3

Prof. Dr Karin Haustermans

Chair of the Department of Radiation Oncology at the Leuven Cancer Institute of the University Hospital, Full Professor at the KU Leuven

Karin Haustermans graduated in 1987 as Doctor in Medicine, Surgery and Obstetrics (MD) at the KU Leuven, Belgium. In 1993, she qualified as a Radiation Oncologist. After a research fellowship at the Laboratory of Experimental Radiotherapy at the KU Leuven, she obtained her PhD in Medical Sciences. Thereafter she spent four years as a staff member at the Netherlands Cancer Institute in Amsterdam.

Currently, Karin Haustermans is Chair of the Department of Radiation Oncology at the Leuven Cancer Institute of the University Hospital and Full Professor at the KU Leuven. She is specialized in GI and GU oncology and has a part time research appointment by the Research Foundation – Flanders. She is a member of several (inter)national scientific organizations as well as clinical editor of Radiotherapy and Oncology. She is also heavily involved in the Belgian Cancer Registry as a member of the board and Chair of the Coordination Council. From 2009 till 2012 she represented Belgium in the Scientific Council of IARC.

In 2009 she was awarded the ESTRO Breur medal in recognition of her major contribution to European Radiotherapy. In 2015 she was elected as a fellow of the European Academy of Cancer Sciences.

The use of population based cancer registries: the oncologist point of view

New cancer treatment modalities are most often tested in clinical trials starting from Phase I until Phase III before being implemented in routine clinical practice. However, it is well known that patients participating in clinical trials are not always representative of the general population of cancer patients. Population based cancer registries can provide an answer on the uptake and outcome of new treatments in the general population. Based on these results the next step is to evaluate the implementation of and adherence to the clinical guidelines in real practice. This can be studied by defining quality indicators based on the clinical guidelines.



keynote 3

Through the results of the quality indicators clinicians get feedback on the process and outcome of their daily practice. This feedback initiates a loop of continuous monitoring ultimately leading to an improvement in outcome for the individual cancer patient. Also governments can use these results to organize health care in their respective countries via for instance reference networks or by centralizing certain pathologies. Over the years European collaboration has become more and more important especially for rare cancers but not only for rare cancers. Via European collaboration differences in treatment outcome between countries can be studied and measures can be taken to harmonize and improve cancer treatment and outcome at the European level. Comparability of data over time and across registries are a prerequisite.

However, all of the above is only possible if the national cancer registry covers the population and has access to structured clinical and administrative data. It also requires a timely reporting of process and outcome indicators to evaluate quality of care. Moreover, only via knowledge exchange and collaboration between cancer registries and clinicians relevant results will be obtained. A major challenge ahead of us lies in the integration of omics data in the cancer registries and to link them with biobanks. Without this the role of population cancer registries will be threatened in the era of personalized cancer medicine.



keynote 4

For a developing population-based cancer registry in the presence of limited resources, it is often advised to focus data collection activities on the core registry function of capturing complete, timely and accurate incidence data only. These data provide the critical foundation for understanding the descriptive epidemiology of cancer in the underlying population and guiding initial cancer prevention and control activities. For more established registries, staging data become a critical component of cancer data collection activities providing another tool to support cancer control activities, assist in the interpretation of outcome data, and facilitate more effective use of registry data for research activities. While the value of these data is generally widely accepted, cancer staging is one of the most complex set of data elements for a registry to collect largely attributed to the diverse site-specific variation in stage definition which complicates training activities required for accurate data collection. Add to this the array of clinical data that must be accessed to properly measure disease extent and the incorporation of clinical factors into historic anatomic staging and the complexity of data collection becomes ever more apparent. Despite this complexity, there is much that can be learned from experience in stage data collection over the past 40 years. Through exploring the challenges and successes in cancer stage data collection and understanding the appropriate use of these data for population-based cancer registries, one can begin to address the complexity and provide guidance for developing means to incorporate these important data into cancer collection activities.

Keynote lecture 4

Kevin Ward, PhD, MPH

has worked in cancer surveillance, registration and control for over 15 years. Dr. Ward is the Director of the Georgia Center for Cancer Statistics and an Assistant Professor of Epidemiology at Rollins School of Public Health of Emory University. Dr. Ward is a member of the Cancer Prevention and Control Research Program at Winship Cancer Institute. He also currently serves as the Principal Investigator for the National Cancer Institute's Georgia Surveillance, Epidemiology and End Results (SEER) Registry. He is one of the current North American Regional Representatives on the Executive Board of the International Association of Cancer Registries and has been a member of the Registry Steering Committee of the Middle East Cancer Consortium since 2007. Within North America, he has been actively engaged in numerous leadership positions with the North American Association of Central Cancer Registries.

Education

Dr. Ward earned both a PhD and MPH from Emory University.

Research

Dr. Ward has extensive experience with cancer surveillance and control activities, population science, population-based registry data, registry operations, data security, electronic capture of cancer case data, linkage of data to external data sources, and uses of the registry for research purposes. He collaborates with students and researchers across the nation to analyze existing registry datasets and to utilize the population-based Georgia Cancer Registry as a linkage source or sampling frame for countless research studies. Data from the Georgia Center for Cancer Statistics furthers our understanding of cancer in Georgia and is used to develop strategies and policies for cancer prevention and control.



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1.1

MIND THE GAP: ELDERLY CANCER PATIENTS LACK BEHIND IN GAIN IN SURVIVAL

Prof. Dr Sabine Siesling, Brendy Wauben-Spaetgens, Otto Visser MD PhD

IKNL / Twente University, Netherlands; IKNL, Netherlands

Background Survival of cancer patients is increasing due to early diagnosis and improved diagnosis (e.g. imaging) and treatment (e.g. immunotherapy).

Aim to determine whether elderly patients (65-75 and >75 years old) benefit from the innovations to the same extent as younger patients.

Methods from the Netherlands Cancer Registry all cancers diagnosed 1989-2014 were selected. Follow-up was obtained through the municipality register until February 2017. Five year relative survival (RS) was analysed using the Ederer II method and survival gain in patients in patients aged 18-49, 50-64, 65-74, 75-84 and 85 years or older at time of diagnosis was calculated. We compared the gain in RS during 1989-2014 for the different age groups.

Results 5-year RS increased 21% for males below 75, 13% in 75-84 and 4% in males 85 years or older. In females the increase was 11%, 5% and 5%, respectively. A lower gain in survival was observed in elderly patients (75 years or older) compared to younger patients (<65), especially for salivary gland (-18%), oropharynx (-16%), hypopharynx (-17%), oesophagus/cardia (-6%), small intestine (-11%), SCLC (-5%), gallbladder (-9%), bone (-16%), breast (-9%), cervix (-10%), prostate (-7%), B-NHL (-8%) and AML (-22%).

Only a small difference was observed for colon (-2%), liver (-3%), biliary duct (0%), NSCLC (+1%), vulva (+2%), testis (+2%) and brain (-3%). In several tumours more survival gain was observed in elderly than in younger patients, especially in melanoma (+13%), carcinoid (+16%), larynx (+4%), soft tissue (+6%), bladder (+7%), eye (+9%), thyroid (+5%), Hodgkin lymphoma (+9%) and indolent B-NHL (+15%),

Conclusion During the past 25 years gain in survival was less in elderly patients than in younger patients. Possibly many treatments are too aggressive for elderly patients due to frailty and co-morbidity. For an increase in survival of elderly patients less aggressive treatment options are necessary.

1.2

CANCER SURVIVAL IN COUNTRIES IN TRANSITION (SURVCAN-3)

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IARC, France; Cancer Institute (W.I.A), India; Tata Memorial Centre, India

Background Cancer survival is a key indicator of the effectiveness of cancer services and is a measure of prognosis that can reflect the prospects of clinical cure. However, survival studies remain sparse in many transitioning countries due in large part to the absence of complete or accurate national mortality information systems. Thus, to ensure the continued development of cancer survival statistics for benchmarking purposes in transitioning countries, and to support registries in developing their own capacity to collect and analyze such data, the SURVCAN-3 project was launched.

Methods The project maintains the same principles as the first two volumes and includes all cancer diagnoses between 1 January 2006 and 31 December 2012 with a minimal follow-up of 2 years. All registries whose incidence data were accepted into CI5 IX or X are eligible to participate. Other registries are also eligible, provided their data quality indices are satisfactory for at least some cancer sites or part of the diagnosis period. Ultimately, 1-, 3-, and 5-year relative and crude survival rates, conditional survival, and survival trends will be investigated.

Results The call for data was released in September 2016 to over 80 cancer registries from 40 countries. As of May 2017, 82 cancer registries have agreed to participate in SURVCAN-3, of which 57 have sent initial data. Data quality checks and processing are currently being undertaken, and preliminary analyses and results will be presented.

Conclusions SURVCAN-3 seeks to provide systematic, comparative survival data from population-based cancer registries in countries under transition. The results provide a context in which to compare survival in these countries with those from more industrialized countries, whilst also investigating deficiencies in cancer registration, clinical follow-up, and delivery. Further, these findings will provide important information for public health authorities in order to ensure improved and equitable cancer care.

1.3

RECENT TRENDS IN MELANOMA RELATIVE SURVIVAL IN GERMANY STRATIFIED BY AGE GROUP, T-STAGE, AND HISTOLOGY

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Background Prognosis of melanoma patients improved in Europe between 1999-2007. In Germany, prognosis did not change significantly during 2002-2006. We sought to estimate up-to-date 5- and 10-year melanoma relative survival (RS) stratified by prognostic factors and identify recent trends.

Methods Data from 12 cancer registries covering a population of 28.2 million inhabitants (34.9% of Germany) were analysed. We included patients with a primary cutaneous malignant melanoma (ICD-10: C43.X) diagnosed in 1997-2013 who were at least 15 years old. Death certificate only cases were excluded. Five- and 10-year RS were estimated by period analysis. For 10-year RS analyses, we excluded cases 75 years or older. Analyses stratified by sex, age group, histology, tumour stage, and body site were conducted. We performed age standardisation according to International Cancer Survival Standards.

Results In the analysis, 82,901 melanoma cases were included of which 51% were female. Median age at diagnosis was 62 years. Five- and 10-year RS in 2007-2013 were 92.4% and 90.8%, respectively. RS was higher in women. Prognosis worsened with increasing age and higher tumour stage. In superficial spreading (SSM) and lentigo maligna melanoma RS was high, whereas it was lower in nodular, acral lentiginous and 'other' melanoma. Melanoma on arms had highest RS, while RS of melanoma on unknown or overlapping sites was lowest. Five- and 10-year RS increased significantly from 2005-2007 and 2008-2010 to 2011-2013 by 3.5 and 3.3% units, respectively. Increase of 5-year RS was particularly strong for cases aged 65 and above. In melanoma of 'other' histology, 5- and 10-year RS improved significantly. Ten-year RS also significantly increased for men with SSM (+3.3% units), women with T3 melanoma (+5.4% units), and men with T4 melanoma (+11.4% units).

Conclusion Long-term RS of melanoma cases in Germany has significantly improved. Recent trends stratified by prognostic factors were identified.

1.4

NO IMPROVEMENT IN LONG TERM SURVIVAL FOR EPITHELIAL OVARIAN CANCER PATIENTS; A POPULATION BASED STUDY BETWEEN 1989 AND 2014 IN THE NETHERLANDS

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Background This study investigates changes in therapy and long-term survival for patients with epithelial ovarian cancer (EOC) in the Netherlands.

Methods All patients with EOC, including peritoneal and fallopian tube carcinoma, diagnosed in the Netherlands between 1989 and 2014 were selected from the Netherlands Cancer Registry. Changes in therapy were studied and related to overall survival using multivariable Cox regression models.

Results 32,540 patients were diagnosed with EOC of whom 22,047 (68%) had advanced stage. In early stage, lymph node dissection as part of surgical staging procedures increased over time from 4% in 1989-1993 to 62% in 2009-2014 ($P < 0.001$). In advanced stage, the number of patients receiving optimal treatment with surgery and chemotherapy increased from 55% in 1989-1993 to 67% in 2009-2014 ($P < 0.001$). Five-year survival rates improved in both early stage (74% vs. 79%), advanced stage (16% vs. 24%), and in all patients combined (31% vs. 34%). Ten-year survival rates, however, slightly improved in early stage (62% vs. 67%) and advanced stage (10% vs. 13%), but remained essentially unchanged at 24% for all patients combined.

Conclusion Despite intensified treatment and staging procedures, long-term survival for women with EOC has not improved in the last 25 years. The observed improvements in five-year OS reflect a more prolonged disease control rather than better chances for cure. Furthermore, the apparent better long-term outcome when early and advanced stage are analysed separately is largely due to improved staging procedures and the ensuing stage migration. These effects disappear in a combined analysis of all patients.

1.5

RECENT TRENDS IN REGIONAL DIFFERENCES IN CANCER SURVIVAL IN JAPAN: POPULATION-BASED CANCER REGISTRY DATA IN 1993-2008

Dr Yuri Ito, Dr Keisuke Fukui, Dr Hadrien Charvat, Dr Kota Katanoda, Dr Tomohiro Matsuda

Cancer Control Center, Osaka International Cancer Institute, Japan; National Cancer Center, Japan

Background Inequalities in cancer care have been targeted in the National Cancer Plan in Japan since 2007. We aimed to monitor the trends in regional differences in cancer survival for major cancer sites using population-based cancer registry data in Japan.

Methods We obtained data of cancer patients diagnosed in 1993-2008 (for six prefectures) or in 2006-2008 (for 15 prefectures) and followed-up for at least five years. XXXX cases of stomach, colorectal, pancreatic, lung, breast and cervical cancer were analysed. Long-term (6 prefectures) and short-term (all 21 prefectures) trends in cancer survival were analysed by flexible hazard regression models adjusted for age and with or without further adjustment for stage. The excess hazard approach was used to account for mortality from other causes. For long-term trends, prefectures were considered as fixed effects; for short-term trends, between-prefecture variation was account for through inclusion of a random effect. Regional variation in cancer survival was graphically evaluated through funnel plots of the prefecture-specific excess hazard ratios (or the predicted prefecture-specific random effects), allowing the identification of outlier prefectures.

Results For stomach, colorectal and lung cancer, we observed large variation in excess death from cancer among prefectures. However, this variation was somewhat smaller after adjustment for stage. This might be explained by differences among prefectures in stage distribution related to early detection procedures. The variation in excess hazard of death was found to get smaller after 2000s. But even in the latest period, there were still wide gaps in cancer survival among the 21 prefectures for most cancer sites: this might have been due to differences in follow-up procedures.

Conclusions We monitored trends in regional differences of cancer survival in Japan. To reduce the gap among prefectures, further analyses are needed to understand its determinants, such as differences in medical care access and socioeconomic inequalities.

1.6

SOCIOECONOMIC AND DEMOGRAPHIC DISPARITIES IN BREAST CANCER STAGE AT PRESENTATION AND SURVIVAL IN SWITZERLAND

Anita Feller MSc, Schmidlin Kurt, Andrea Bordoni, Christine Bouchardy, Jean-Luc Bulliard Bouchardy, Bertrand Camey, Isabelle Konzelmann, Manuela Maspoli, Manuela Maspoli, Kerri Clough-Gorr

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Background A major goal of health care systems is to improve health equally in all groups of the population. However, socioeconomic and socio-demographic health inequalities in breast cancer (BC) detection and survival have been observed in many countries.

Methods We explored socioeconomic and socio-demographic disparities in BC stage at presentation and survival in female BC patients from population-based cancer registries anonymously linked to the Swiss National Cohort (SNC). Tumour stage was classified according to SEER summary stage (in situ/localized/regional/distant). We used highest education level attained from the SNC to characterize socioeconomic position (SEP) in 3 levels (low/middle/high). Further characteristics included in the analyses were age, living in a canton with organized mammography screening (yes/no), civil status and Swiss nationality. We used ordered logistic regression models to analyse factors associated with BC stage at presentation and competing risk regression models for factors associated with death from BC.

Results Odds of later-stage BC were significantly increased for low SEP (odds ratio (OR) 1.26, 95%CI 1.12-1.41) and middle SEP women (OR 1.11, 95%CI 1.01-1.23) compared to women of high SEP. Further, women living in a canton without organized mammography screening, women diagnosed outside the screening age and non-married women were more often diagnosed at later stages. Women of low SEP experienced an increased risk of dying from BC (sub-hazard ratio 1.28, 95%CI 1.10-1.50) compared to women of high SEP. Notably, these BC-specific survival differences remained after controlling for stage at presentation and/or other sociodemographic factors.

Conclusion It is of concern that these SEP gradients exist in a country with universal health insurance coverage, high health-related expenditures and one of the highest life expectancies in the world. Appropriate intervention strategies are needed to reduce socioeconomic and socio-demographic inequalities in BC stage at presentation and survival.

2.1

CANCER INCIDENCE IN FIVE CONTINENTS
VOLUME XI: STATUS AND PLANS

Dr Freddie Bray, Ms Murielle Colombet, Mr Les Mery, Dr Marion Piñeros, Dr Ariana Znaor, Dr Roberto Zanetti, Mr Jacques Ferlay
IARC, France; CPO Piemonte, Italy

Background The call for incidence data for Volume X covering 2008–12 was sent out to IACR Members mid-2015 via the IARC data portal. With the editorial process near completion and the data to be disseminated in 2017, a global overview of the status and plans will be presented.

Methods After an extensive process of verifying coding, identifying duplicate registrations, querying unlikely/impossible combinations of codes and converting the data to a standard format, each dataset was evaluated using three axes of data quality: comparability, completeness and accuracy. The Editors conducted a detailed assessment of preassembled registry-specific tables including site-specific case numbers, age-specific rates and summary rates, the populations at risk by sex and age, and a comparison with the 5-year population data from the previous volume, where applicable.

Results Submissions were received from 474 registries worldwide, providing datasets covering 632 populations; these data were reviewed by the Editorial Board during a series of meetings at IARC; the process will be complete early-Autumn 2017. The presentation will provide details of the status of registries with regards submissions and the specific challenges faced by registries both in submitting their data as well as meeting the strict inclusion criteria. Some early results will be presented.

Discussion/conclusions While the editorial processes have not changed materially in recent volumes, some changes were foreseen with Volume XI. Firstly, with an ever-increasing number of registries compiled in each volume, more emphasis on dissemination via interactive online tools is needed that refocuses attention on the enormous value of the underlying data in descriptive epidemiologic research. Secondly, the strict criteria of inclusion negates the ability for many registries in resource-challenged settings to publish their results internationally and thus demonstrate their value. To ensure a more equitable means of disseminating results, a parallel development of regional reports and interactions between GICR and IACR to support registry communications is underway.

2.2

USING POTENTIAL GAINS IN EXPECTATION OF
LIFE TO QUANTIFY THE IMPACT OF POPULATION
DIFFERENCES IN CANCER SURVIVAL

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University of Leicester, UK; Karolinska Institutet and University of Leicester, Sweden and UK

Background Cancer survival estimates for different population groups are often expressed using relative survival, which is a useful metric for fair comparisons, but lacks easy interpretation. An alternative approach to quantify the impact of cancer is to calculate the average loss in life expectancy associated with a cancer diagnosis by taking the difference between the life expectancy in the general population to that in the cancer population. Furthermore, the impact of removing inequalities can be understood by calculating the average gain in life years should socioeconomic differences in relative survival be removed.

Methods The same modelling approach for calculating standard relative survival estimates across continuous age and deprivation group (5 groups in England) can be utilised to estimate average life years lost by making simple and sensible extrapolations of the long-term excess mortality. The approach will be illustrated using English cancer patient data, highlighting how deprivation inequalities in survival can be reported using the potential gain in life years as a metric.

Results Due to the observed socioeconomic inequalities there are significant gains in life years that can be made by removing cancer-specific mortality differences. For example, for a female diagnosed with colon cancer at age 70, a patient in the most deprived group could gain 1.5 years in terms of life expectancy on average by removing inequalities in relative survival. Overall for females diagnosed with colon cancer in 2013 in England, around 4,000 extra life years could be gained by removing inequalities in relative survival across deprivation groups.

Conclusions It is vital that a range of metrics are available to fully communicate the impact of differences in cancer patient survival across population groups. Using the potential life years gained to quantify impact and for expressing the potential for population group improvements, give tangible and easily interpretable measures.

2.3

VIRTUAL POOLED REGISTRY CANCER LINKAGE SYSTEM FOR COHORT MATCHING AND DUPLICATE IDENTIFICATION

Dr Lynne Penberthy, Ms Betsy Kohler, Dr Dennis Deapen, Ms Castine Clerkin, Mr Andrew Lake

National Cancer Institute, USA; North American Association of Central Cancer Registries, USA; Keck School of Medicine, University of Southern California, USA; Information Management Systems, USA

Background Matching cohorts with multiple cancer registries is useful for confirming cancer diagnoses and obtaining additional information including outcomes. However, this process is difficult, labor-intensive and costly if separate permission to match is needed for each registry. The use and interpretation of different matching protocols in each setting may affect study validity.

Methods NAACCR and the NCI(US) have been developing a Virtual Pooled Registry-Cancer Linkage System (VPR-CLS) allowing researchers to submit cohort data for matching with multiple cancer registries. Confidentiality of the data is maintained by conducting the match behind the Registry's firewall. We use automated matching with sophisticated software developed for this purpose thereby ensuring that standardized criteria are used across sites. Two pilot projects have been conducted as proof of concept with 45 registries participating in a match with a cohort of environmentally exposed military personnel, and a cohort of radiation technologists with occupational exposures dating to the 1950s. The system may also be used to identify duplicate cases and multiple primaries across geographical jurisdictions. A pilot test of this feature is underway.

Results Matches were obtained in every population-based cancer registry. Initial match frequencies were provided to researchers for prioritization for obtaining release of personal identifiable data. Results of the duplicate case identification process will be available for presentation. We will discuss the system, address the challenges and barriers we have encountered, and demonstrate the no-cost matching software and supporting project tracking system.

Discussion The VPR-CLS was developed as a collaboration among the US registry programs (SEER & NPCR), NAACCR and their statistical partner IMS, Inc. There is wide utility of the system for use by a range of epidemiology and clinical research and the concept is adaptable in a wide range of international settings.

2.4

INCIDENCE OF GYNECOLOGIC CANCERS IN WOMEN OF UASIN GISHU COUNTY IN KENYA (2010-2014)

Ms Chebet Chesumbai, Ms Jane Chepkosgei, Ms Anne Koskei, Dr Nathan Buzibu, Mr Hillary Mugun

The Eldoret Cancer Registry - AFCCRN, Kenya

Background Cancer is now a major global health problem, with health and subsequent economic burden rapidly moving to the developing world. Over 50% of the new cases, and 60% of the deaths are now reported to occur in the less developed countries, including those in Sub-Saharan Africa (Torre et al., 2015). In America, every six minutes a woman is diagnosed with gynecologic cancer. It is estimated that there will be 91,730 new cases diagnosed in the United States this year alone resulting in a predicted 28,080 deaths. Some of these gynecologic cancers have been called "silent killers" because women are often unaware of the signs and symptoms associated with these cancers and do not catch them until it is too late (Philip J. Di Saia, 2017).

Methods Trained cancer registrars were involved in active case finding and data collection in health facilities within the defined population of Uasin Gishu. Confirmed gynaecologic cancer cases were abstracted and filled into case registration forms; Data quality checks were done, coding of cases was done using the ICDO-3 and data management was done using CANREG5.

Results A total of 2,528 cancer cases were registered within the period 2010-2014. Of these, the total female cancers were 1387. The most common gynecological cancers were, cancer of the cervix with 295 cases and ASR of 21.9; ovarian cancer 45 cases, corpus uteri 25, uteri unspecified 17, vulva 5, vagina 2 with ASR per 100,000 of 3.3, 2.7, 1.7, 0.4 and 0.1 respectively. These cancers were more prevalent in adults of 30-74 years.

Conclusion Notably, gynecological cancers are more prevalent in women of productive years, and it is associated with HPV/HIV infections; women who have unexplained infertility and late menopause. More studies should be conducted in order to establish its associated risk factors in Uasin Gishu.

2.5

INTER-CENTER HETEROGENEITY IN THE QUALITY OF CARE FOR RECTAL ADENOCARCINOMA IN BELGIUM

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Background The Belgian Cancer Registry (BCR) conducts studies on quality of care indicators (QCI) for specific cancers by linking its population-based cancer registration database with administrative databases. These projects aim to compare and finally improve quality of care in Belgian hospitals. In the present study, QCI on rectal cancer were calculated at the Belgian population and hospital level.

Methods All patients registered by the BCR with unique rectal adenocarcinoma between 2009 and 2011 were selected (n=6,776). After assigning patients to a hospital, different process and outcome indicators were calculated at the national and hospital level: participation in multidisciplinary team meetings (MDT), administration of (neo)adjuvant chemo/radiotherapy, postoperative mortality and observed and relative survival. QCI were adjusted for differences in case-mix between hospitals, including sex, age, stage and WHO performance score.

Results All 103 Belgian hospitals treated rectal cancer in this period, ranging from 7 to 344 cases per hospital (median: 49 cases). The largest center treated 5.1% of all cases. An MDT meeting was reimbursed for 40.7% to 100% of the patients. Neo-adjuvant radiotherapy was given to 43.5% to 100% of cStage II-III diseases and adjuvant chemotherapy was administered to 16.7% to 80.0% of the patients in (y)pStage II-III. Postoperative 30-day and 90-day mortality ranged from 0.0% to 19.4% and 0.0% to 20.8%, respectively. The 5-year observed and relative survival ranged from 29.6% to 71.4% and from 47.3 to 81.0%, respectively. This large inter-center variation in QCI results remained present after case-mix adjustments.

Conclusion Even for common cancers such as rectal adenocarcinoma, substantial variability in treatment and outcome is observed between centers. By providing individual feedback to all Belgian hospitals, foreseeing regular monitoring of QCI results and the possibility to make the results publicly available, centers are encouraged to take further initiatives for quality improvement.

3.1

CHOOSING NO TREATMENT AT ALL IN PANCREATIC CANCER. RESULTS OF A POPULATION-BASED REGISTRY

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Background Pancreatic cancer carries a poor prognosis regardless of stage. To date, there has been little research devoted to decision-making regarding treatment options in pancreatic cancer, including the rationale for choosing only best supportive care. This study aims to gain insight into the characteristics of patients not receiving tumour-targeting treatment (TTT), the reasons for this decision, and their survival.

Methods All patients diagnosed in the Netherlands between January 1, 2014 and June 30, 2015 with a pancreatic adenocarcinoma or a pathologically unverified pancreatic tumour were identified in the Netherlands Cancer Registry. Information on treatment, patient characteristics and main reasons for no TTT (as reported in medical charts) were analysed using descriptive statistics. Also, survival was analysed using Kaplan-Meier curve.

Results A total of 3090 patients were included. Of these patients, 1818 (59%) received no TTT. Mean age of these patients was 73.5 (SD 10.4), versus 64.7 (SD 9.5) for patients who did receive TTT. In the no TTT group 77% had a clinical stage III/IV, whereas this was the case in 57% of patients who did receive TTT. Main reasons for not starting TTT were patient's choice to withhold treatment (27%) and expected poor prognosis (27%). Median survival of patients who did not receive TTT was 1.9 months, ranging from a median survival of 1.4 months (main reason expected poor prognosis) to 4.4 months (main reason old age). In the latter group, a relatively large proportion of clinical stage I tumours was present (37%) (mean age 85.5 SD 4.4).

Conclusion The majority of patients with pancreatic adenocarcinoma received no tumour-targeting treatment. In most patients, patient's choice not to start treatment was the main reason for withholding treatment, indicating patient's involvement in decision-making. Furthermore, our results may suggest a potential under-treatment of older patients with resectable pancreatic cancer.

3.2

SQUAMOUS CELL CARCINOMA OF BUCCAL MUCOSA: A COHORT STUDY OF PROGNOSTIC FACTORS FROM TATA MEMORIAL HOSPITAL, MUMBAI

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Background Carcinoma of the buccal mucosa is the commonest oral cavity cancer in Indian subcontinent. The aim of this study was to analyze the outcome and evaluate prognostic factors in surgically treated buccal mucosa squamous cell carcinoma (BMSCC) patients.

Methods A retrospective study was performed by reviewing the medical records of 409 pathologically proven buccal mucosa cancer patients, who were diagnosed and surgically treated in Tata Memorial Hospital between 01 Jan 2006 - 31 Dec 2008.

Results The overall five year's survival of the cohort was 54.1%. The stage-wise survival rate for TNM stage I, II, III and IV patients was 85.2%, 82.9%, 56.3% and 42.6% ($p < 0.00$) respectively. Patients with moderately/poorly differentiated cancer had a poor survival rate. Perineural invasion emerged as an independent prognostic factor for patients with buccal mucosa cancer (HR, 1.051; 95% CI, 1.04 – 2.81; $p = 0.02$). Tumor size more than 4 cms (HR = 1.69, 95% CI = 1.04 – 2.76; $p < 0.01$), clinical node involvement, histological nodal metastasis (HR = 1.54, 95% CI = 1.50 – 2.57; $p < 0.01$) and Extracapsular spread (ECS) were significantly independent predictor of poor prognosis (HR = 2.25, 95% CI = 1.60 – 3.08; $p = 0.00$). Patients treated with Only Surgery (63.3%) had the best five year survival as compared to with surgery + RT (49.7%) or surgery + RT+CT (44.1%).

Conclusion The study presents a comprehensive evaluation of prognostic factors and demonstrates that besides conventional TNM system, other factors viz comorbidity, tumor differentiation, extracapsular spread and perineural invasion also play a major role in buccal mucosa cancer prognostication. In addition to TNM classification other clinical and pathological factors also have a significant role in BMSCC prognostication. Hence, there is a need to move beyond TNM and develop a more inclusive, flexible and easy to use prognostic system.

3.3

ESTROGEN RECEPTOR STATUS, TREATMENT AND BREAST CANCER PROGNOSIS IN ICELANDIC BRCA2 MUTATION CARRIERS

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Background 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.

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 a higher risk of death than negative ER status (HR=1.94; 95% CI: 1.22–3.07). The reverse association was seen for non-carriers (HR=0.71; 95% CI: 0.51–0.97; $P=0.03$). Long term risk of death was higher among BRCA2 carriers than non-carriers (HR = 1.61; 95% CI 1.11 to 2.35) and the survival disadvantage was present in patients treated with lumpectomy (HR = 4.16; 95% CI 1.88 to 9.17) but not in women who underwent mastectomy (HR = 1.25; 95% CI 0.82 to 1.93). In the subgroup not receiving chemotherapy BRCA2 carriers had lower survival than non-carriers (HR = 2.38; 95% CI 1.31 to 4.34), but in the subgroup treated with adjuvant chemotherapy survival was similar for carriers and non-carriers (HR = 1.21; 95% CI 0.74 to 2.00).

Discussion/conclusion Among BRCA2 carriers, ER positive status is an adverse prognostic factor. Mutation carriers had a long-term survival disadvantage, but only among women who did not receive adjuvant chemotherapy or mastectomy. BRCA2 carrier status should be known at the time when treatment decisions are made.

3.4

THE IMPACT OF USING REGIONAL DATA AS A BASIS FOR NATIONAL CANCER BURDEN PREDICTIONS IN EUROPE

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Background Predicting cancer incidence and mortality plays an important role in epidemiological analysis, both for research and policy purposes. Predictions should always be published with the related prediction interval, in order to properly assess their reliability. When computing cancer burden figures at national level, information about the regional data used as the basis for prediction can be important, since possible regional differences in cancer incidence/mortality patterns could influence the computed national values. The objective of this study is to check, in practice, how the lack of available regional data, (and thus using only unstratified national data), for making national predictions may change the results as compared to when regional variability is taken directly into account during the predictive process.

Methods Data from the “Incidence and Mortality in Europe” project, launched in 2015 by the European Network of Cancer Registries (ENCR) in collaboration with the European Commission’s Joint Research Centre (JRC), will be used for this assessment. Out of the participating cancer registries, few national registries submitted regional information. For these countries, regional predictions will be computed and aggregated as a second step to assess the national level. These figures will then be compared with the same indicators computed directly at national level.

Results The possible discrepancies, and the magnitude of these discrepancies, between both approaches depend on the regional heterogeneity of incidence patterns in the country and the consistency of regional trends. The bigger the heterogeneity, the lower the consistency of trends and, therefore, the greater the chance of finding meaningful differences between both predictive approaches.

Conclusion This comparison will enable a quantitative assessment of how much missing regional data may bias the final prediction for the whole country. The precision of both approaches will also be compared.

3.5

CANCER STAGING IN POPULATION-BASED CANCER REGISTRY: RATIONAL FOR ESSENTIAL TNM

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Background Cancer stage is an important measure of disease progression; at a population level it provides an indication of advances in cancer control activities. The TNM is the most commonly used classification system; yet for many population-based cancer registries (PBCR), particularly in less resourced settings it remains challenging to collect.

Design and methods We assessed cancer registry survey on staging data availability in three consecutive periods of the Cancer Incidence in 5 Continents series (1997-2012). Data availability was assessed for five major cancer sites including the breast, cervix, lung, colorectum and prostate. At a second step, data from four PBCRs from different world region was scrutinised to assess data availability by cancer sites, sex, age, and completeness based on various level of staging data.

Preliminary results In the mid-period of our study, between 2003 and 2007, 226 out of 370 registries (61%) reported collection of staging information. Staging information is most likely to be collected in higher income countries e.g. 89% of registries in North America and 100% in high-income Asian registries (Japan, Republic of Korea and Singapore) as compared to only 44% and 49% in Africa and in Central and South America, respectively. In the national cancer registry of Uruguay, in 2009-2013, 63% of staging information for major cancer sites was missing. The use of summary stage reduced missing data e.g. only 25% of breast cancer cases has missing stage information as compared to 45% if using TNM.

Conclusion There is a marked need to simplify staging data collected for PBCRs; data that is comparable to the complete TNM. The Essential TNM is currently being developed in collaboration with UICC, and has been tested in various field studies. The validity and comparability of staging information is expected to improve with Essential TNM.

3.6

EUROPEAN HIGH RESOLUTION STUDIES: PATTERNS OF CARE FOR BREAST, COLORECTAL, LUNG CANCERS, MELANOMA AND NHL

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Background The High Resolution studies collect more clinical information than those routinely available to cancer registries (CRs) for random cancer cases, aiming to study patterns of care and adherence to evidence based guidelines for diagnosis and treatment. The database includes patients (\approx 15 years) diagnosed with breast (BC), colorectum (CRC), lung cancers, skin melanoma (MEL), and NHL (follicular and diffuse large-B cell lymphoma) in 2009-14 from 52 CRs in 13 countries.

Methods The present study analyses five cancer-specific indicators of standard treatment in 6 countries [Belgium, France, Italy, Portugal, Spain, Switzerland] for CRs with $<30\%$ of unknown information in the analysed variables:

- Breast-conserving surgery and radiotherapy (BCS-RT) in 7085 stage I-IIA BC cases:

- Adjuvant CT in stage II/III CC cases surgically treated (1864 stage II and 1591 stage III cases):

- Curative surgery in stage I-II non-small LC (NSLC) (534 cases):

- Sentinel lymph node biopsy (SLNB) in \approx 1mm MEL (901 cases):

- Targeted therapy (TT) in NHL, after excluding cases with watchful waiting decision (1215 cases).

Results BCS-RT: 68% (34 out of 35 [34/35] CRs: 41% Portugal-77% France) of stage I-IIA BC;

Adjuvant CT: 23% (18 CRs: 12% Switzerland-30% Italy) of stage II CC and 64% (18 CRs: 44% Switzerland-70% Belgium) of stage III CC;

Curative surgery: 65% (6 CRs: 56% Portugal-74% Switzerland) stage I-II NSLC;

SLNB: 66% (7/8 CRs: 57% Italy-74% Portugal) of \approx 1mm-Breslow MEL;

TT: 83% (6/7 CRs: 71% Italy-90% France) of NHL.

Discussion Although some updating and corrections are still needed, information availability on stage work-up and therapeutic management was good. Differences in the adherence to clinical guidelines persist across Europe: resources availability, differences in health system organization and comorbidity at diagnosis could play a role. Multivariable comprehensive analyses, including comorbidity (where available), will be finalized after the conclusion of updating and corrections.

4.1

KNOWLEDGE TRANSFER AND TRAINING THROUGH THE GLOBAL INITIATIVE FOR CANCER REGISTRY DEVELOPMENT (GICR)

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Background For maximum benefit, cancer registries must adhere to international standards and gain skills to increase their visibility. To meet the growing demand worldwide for technical training, support within the Global Initiative for Cancer Registry Development (GICR) is being expanded to widen the use of regional experts and technology. The presentation will focus on new educational approaches of the GICR.

Methods Three integrated programme components are being developed. The GICRNet will use a 'train the trainer' model to form networks of experts in specific subject areas. Candidates will be selected from the IARC Hubs and enabled to deliver regional courses. To compliment formal training, the GICR Mentorship and Twinning Programme will provide opportunities for knowledge transfer through peer-peer exchanges. The goal is to build local capacity by matching established cancer registries with those less developed within the same region. To increase access to educational material, the GICR Best Practices Portal will comprise key resource publications, webinars and on-line learning modules. A restricted area for the GICRNet and Mentorship Programme will be included with annotated teaching material.

Results The first GICRNet course was held in 2016 on CanReg5. A total of 14 participants attended from across Africa, Asia and Latin America. Regional CanReg5 trainers have subsequently contributed to training courses, new software features and provided tailored support. A second course is under development for 2017, focused on data coding and staging. Mentorship exchanges have been held in each of the established IARC Hubs. The first on-line learning module is being planned concurrently with the development of IARC technical publications.

Discussion and conclusion To further support the development of local cancer registry capacity, increased opportunities to expand training and knowledge translation are being established through the GICR. The improved integration of regional expertise will provide long term sustainability and cost effectiveness.

4.2

OVERALL SURVIVAL IN ELDERLY PATIENTS WITH COLORECTAL CANCER: A POPULATION-BASED STUDY IN THE CARIBBEAN

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Background Population-based Cancer registries (PBCR) play an important role in cancer surveillance and research. The aim of this study was to examine overall survival in elderly patients with colorectal cancer (CRC) by analysing data from the Martinique PBCR between 1993 and 2012.

Methods The log-rank test was used to assess the statistical differences of the survival curves by each categorical variable: age at diagnosis, sex, histology, zone of residence, subsite, stage at diagnosis, and chemotherapy in incident. A multivariable Cox model was performed to identify independent prognostic factors for overall survival in elderly patients with colorectal cancer.

Results Among 2230 patients included in the study, 60.8% were aged = 65 years; mean age at diagnosis of these patients was 75.7±7.2 years. For the period 2008-2012, 532 elderly patients were analysed; mean age of those receiving chemotherapy was 73.0±0.4 versus 77.9±0.4 years for those not receiving chemotherapy ($p<0.0001$). Stage at diagnosis was evaluated in 87.8% (467/532) of patients; 63.0% (294/467) had stage III-IV and 49.3% of these patients (145/294) received chemotherapy. Chemotherapy was less frequently prescribed in patients aged 75-84 and ≥85 years as compared to those aged 65-74 years (41.1% and 15.0% versus 64.6% respectively; $p<0.0001$). Stage III-IV at diagnosis (HR=5.25; 3.70–7.45; $p<0.0001$), and not receiving chemotherapy (HR=3.05; 2.23–4.16; $p<0.0001$), were independent prognostic factors for overall survival.

Conclusion Our study highlights the role of PBCR in evaluating cancer survival and patterns of care in elderly people of the French West-Indies. Chemotherapy was less frequently prescribed among the elderly.

4.3

TRANSLATION INTO PRACTICE: TESTING NEW INTERNATIONAL GUIDELINES FOR POPULATION-WIDE STAGING OF CHILDHOOD CANCER

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Background International surveillance of childhood cancer outcomes is hindered by the general absence of population-wide data on stage at diagnosis, compounded by the lack of a standard staging system for many childhood malignancies. In 2017 the Union for International Cancer Control endorsed the Toronto Paediatric Cancer Stage Guidelines, a two-tiered system for the collection of childhood cancer stage by population registries suitable for low (Tier 1) and high (Tier 2) resource settings. Our objectives were to trial the Guidelines and assess their feasibility for collecting cancer stage on a population-wide basis.

Methods Detailed malignancy-specific staging rules were developed according to the Guidelines. A sample of 1,412 patients diagnosed during 2006-2010 was randomly selected from the Australian Paediatric Cancer Registry. For each case, the required data items were collected from hospital records and stage at diagnosis was assigned using the staging rules. Stage recorded by the treating physician was noted when present in the chart. A random subsample of 160 cases underwent expert review to assess accuracy of the assigned stage.

Results Using the staging rules we developed, hospital records were sufficiently complete for stage to be assigned for 93% (1,319) of patients. The expert panel agreed with the assigned stage in all but 4 cases sampled for review. In contrast, stage recorded by the treating physician at the time of diagnosis could be located for only 41% of patients and, among these, the staging systems used were rarely documented.

Conclusion The Toronto Pediatric Cancer Stage Guidelines provide a highly functional framework for the collection of consistent and substantially complete information on childhood cancer stage at diagnosis by population registries. Testing in other countries will be an important next step towards implementation of the Guidelines. This study was supported by Cancer Australia through a national initiative to improve cancer staging data for all Australian patients.

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A1.1

POTENTIAL YEARS OF LIFE LOST DUE TO CANCER IN BELGIUM

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Background The potential years of life lost, PYLL, calculated as the number of years not lived before a reference age, is a measure of premature death. In a cohort of cancer patients both cancer-related and not cancer-related deaths contribute to the observed PYLL, the all-cause PYLL can therefore not be attributed completely to the cancer.

We propose a method to decompose the observed all-cause PYLL into cancer and population background mortality fractions when cause of death information is not available.

Methods PYLL* is the expected PYLL that would be observed in the cohort of cancer patients if they would not have been diagnosed with cancer. The framework of the actuarial relative survival and the Ederer II method is applied to estimate PYLL*. The fraction $(PYLL - PYLL^*)/PYLL$ is the proportion of PYLL that can be attributed to the cancer. The method is applied to cancer incidence in Belgium, 2004-2014.

Results The potential years of life lost per patient, mean PYLL, attributed to the cancer ranges from 0.4 year for prostate cancer to 15 years for tumours of the central nervous system. Low relative survival, (pancreas, lung, mesothelioma) and younger age at diagnosis (e.g. cervical versus colon cancer in females) are associated with higher cancer-specific mean PYLL. Due to the typical incomplete follow-up in population-based cohorts, PYLL measures increase with longer follow-up periods. However, when statistical cure of cancer is achieved, the cancer-specific PYLL reaches a plateau.

Conclusion We proposed a method to compute population-based potential years of life lost due to cancer in the absence of cause of death information. These results can be visualised in combination with cancer incidence, mean age and mean life expectancy at diagnosis. This visual summary enables to compare and rank cancer sites in terms of incidence, relative survival and potential years of life lost.

A1.2

SIMULATION STUDY FOR ASSESSING THE IMPACT OF INCOMPLETE REGISTRATION OF DEATHS

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Background Estimates of cancer survival constitute important information for developing cancer control plan. Hakulinen et al. shows their validity depends on completeness of ascertainment of deaths in the cancer registries. This study measures the impact when completeness varies with age.

Methods Data from the hospital-based cancer registries of 177 designated cancer care hospitals throughout Japan were used. Our analysis considered patients diagnosed with one of five major cancers (stomach, colon, liver, lung, breast) in 2007. We simulated under-ascertainment of deaths through linkage failure of registry data with resident cards (these include information whether patients are alive or not) with probabilities between 1% and 5%. The expected impact on estimates of 5 year absolute and relative survival was assessed.

Results Overestimation of survival increases with the degree of record linkage failure. Relative survival is slightly more affected than absolute survival. The differences in absolute survival resulting from 5% linkage failure range from 0.6 percentage points for female breast cancer patients to 1.9 for lung cancer patients, while those in relative survival range from 0.7 for female breast cancer patients to 2.1 for lung cancer patients. These potential problems are much larger for relative survival estimates in older patients than in younger patients. The difference in relative survival with a 5% failure rate is 0.2 for female breast cancer patients who were under 40 years old, and 3.2 for stomach cancer patients who were over 80 years old.

Discussion/conclusion One would expect overestimation of survival to be negligible with linkage failure of only 1% of deaths. However, with 5% linkage failure, the expected overestimation is greater. It is important to achieve 100% completeness in registration of deaths for estimating survival using cancer registries. When we cannot achieve such completeness, we should interpret survival with caution, particularly, survival for older patients.

A1.3

PROJECTIONS OF BURDEN OF CANCERS: A NEW APPROACH FOR MEASURING INCIDENCE CASES FOR INDIA AND ITS STATES - TILL 2025

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Background Changing way of life, rising longevity and progressive control of communicable diseases has led to emergence non-communicable diseases, which emerged as an important public health problem in India and other developing countries during second half of last century. Burden of cancer is a one of measure contributor among non-communicable diseases in India, which accounts for around 7,06 thousands of cancers cases in males and 6,66 thousands in females in 2015. Hence, the objective of this study was to assess the burden of cancers by place of residence for India and its states for 2015-25.

Material and methods National Cancer Registry Programme (NCRP) is only a reliable source for data on cancer in India. The cancer incidence rates were taken into account from Population Based Cancer Registries (PBCRs) generated by population based cancer registries under NCRP and population of India and states were taken from the report 'projected by Registrar General of India' formed the sources of data. Best possible assessment for incidence rates for non available registry states was worked out by using limited available data. The linear regression method was used to assess trend and project the rates for 2015-25.

Results Overall burden of cancers in India was estimated to be 1.37 million in 2015 and it was increase to nearly 1.80 million by 2025, an increase of more than 30.8%. Major portion of this burden was in rural men (three fifth) and in males (more than half). The detailed analysis indicated regional diversity in the burden of different types of cancers.

Conclusion In view of increasing burden of cancers, there is burning need to initiate focused on control measures to combat the same.

A1.4

RESULT OF THE NEW INITIATIVE TO ESTABLISH EAST AZERBAIJAN POPULATION BASED CANCER REGISTRY (EA-PBCR) IN 2015

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Background Few countries have population based cancer registry (PBCR) in the Middle East and accurate cancer statistics from this region is warranted. We established a PBCR and estimate incidence rate of different cancer types in the East Azerbaijan province in the northwestern Iran (EA_PBCR).

Material and Methods With a population of 3724011 individuals (2011), East Azerbaijan was the sixth largest province in the northwestern of Iran in 2015. EA_PBCR actively collected data from 20 counties, 62 cities, and 44 districts. Data was obtained from pathology labs, hospital medical records, causes of death registry, a radiotherapy center, hematology centers, and imaging departments for one Iranian solar year (i.e. 1394 H.SH corresponding to 20th March 2015- to 19th March 2016). We used CanReg5 software and estimated age standardized incidence rates (ASRs) per 100,000 for all cancers and different cancer types.

Results We collected data of 10110 patients and after removal of the duplicates, and non-residents in this region, 6655 incident patients remained for analyses. ASR for all cancers except non-melanoma skin cancer (C44) was 167.1 per 100,000 for males, and 125.7 per 100,000 for female. The most common cancers were stomach (ASR =29.7), colorectal (ASR=18.2), bladder (ASR=17.6), prostate (ASR=17.3), and lung (ASR=15.4) cancers in men, and were breast (ASR=31.1), colorectal (ASR=13.7), stomach (ASR=13.3), thyroid (ASR=7.8), and esophageal cancers (ASR= 7.1) in women.

Conclusion Results of EA-PBCR showed a considerably high incidence of cancer was considerably high in East Azerbaijan and warrant urgent design and implementation of cancer control program in this region. The results from this registry can be generalized to other provinces, and even neighboring countries that lack PBCR.

Keywords: Cancer; Registry; ASR; Incidence; Crude Rate.

A1.5

ELDERLY PROSTATE CANCER PATIENTS UNDERGO LESS OFTEN CURATIVE TREATMENT AND HAVE A WORSE SURVIVAL THAN YOUNGER PATIENTS: A POPULATION-BASED STUDY IN THE NETHERLANDS

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Background Annually over 10,000 men are diagnosed with prostate cancer in the Netherlands and almost half of these patients are 70 years or older. Therefore, the aim of our study is to examine the clinical features, applied treatments, and the survival of older prostate cancer compared to younger patients in a population-based study in the Netherlands.

Methods All patients diagnosed with prostate cancer between 2005 and 2015 in the Netherlands were retrieved from the database of the nationwide population-based Netherlands Cancer Registry (NCR). We examined the clinical characteristics of the included patients per age group (18-60, 60-69, 70-79, and ≥80 years) and risk groups. Finally, we calculated the 10-year relative survival (RS) stratified by age and risk groups.

Results Approximately 47% of the included patients were older than 70 years. PSA level at diagnosis, Gleason score, as well as clinical stage progressively increased with the age of the patients. Additionally, 23% and 19% of the older patients compared with 15% and 10% of the younger patients had, respectively, a high risk and locally advanced or metastatic disease. The proportion of patients that underwent curative treatment decreased with the increasing age. Patients aged 80 years or older had an odds ratio (OR) of 0.08 (95%-CI: 0.07 – 0.11) for undergoing curative treatment compared to younger patients. Furthermore, the RS of the included patients decreased with advancing age.

Conclusion Elderly men with prostate cancer are more often diagnosed with advanced disease, expressed in a higher PSA level, Gleason score, and a higher risk group at diagnosis. After adjusting for PSA at diagnosis, disease stage, and comorbidities, older prostate cancer patients have a worse prognosis compared to younger patients. Our findings highlight the need for improving methods in clinical decision-making, including the assessment of life expectancy when determining treatment modalities.

A1.6

STOMACH, COLORECTAL, LUNG AND PROSTATE CANCER INCIDENCE AND MORTALITY TRENDS IN MEN IN RUSSIA 1993-2015

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Background Stomach, lung, colorectal and prostate cancer are four most common malignancies in Russia attributed to more than 50% of all registered cancer cases and more than 55% of cancer deaths in men in 2015.

Materials and methods The aim of this study was to estimate men lung, stomach, colorectal and prostate incidence and mortality trends in 1993-2015. Incidence and mortality data were acquired from the State Cancer Registry. The age-standardized rates (ASRs) per 100 000 were analyzed using piecewise linear regression to estimate the annual percentage change (APC) between breakpoints, the average APC was calculated from the drift based on age-period-cohort modelling.

Results Stomach cancer incidence ASRs dropped from 41.4 to 22.1 per 100 000 - APC -2.91% (95%CI:-2.95,-2.87) and mortality from 39.1 to 17.9 - APC -3.44% (95%CI:-3.48,-3.40), respectively. Similarly, lung cancer incidence ASRs decreasing from 76.6 to 49.9 with APC -2.08% (95%CI:-2.10,-2.05) and mortality from 72.7 to 43.4 - APC -2.42% (95%CI:-2.45,-2.39), respectively. At the same time, colorectal cancer incidence increased from 21.4 to 31.8 - APC 1.48% (95%CI:1.44, 2.87), mortality first increased from 18.33 to 19.43 in 2004 - APC 1.13% (95%CI:0.84, 1.42), and then started to decrease till 18.44 in 2015 APC -0.61% (95%CI:-0.81,-0.39). Prostate cancer incidence increased from 9.6 to 16.4 in 2003 - APC 6.32% (95%CI:4.44, 7.20), and then to 40.23 - APC 7.75% (95%CI:7.23, 7.34), prostate cancer mortality also grew from 7.3 to 11.45 in 2010 - APC 2.9% (95%CI:2.72, 3.08), but then increased only to 12.06 in 2015 - APC 0.78% (95%CI:-0.43, 2.01).

Conclusion Despite significant drop in rates, stomach and lung cancer remain leading causes of death in men in Russia. Colorectal and prostate cancer trends should be interpreted carefully and utilized in the planning of cancer control activities. Considering trends cancer screening programs in Russia should be improved.

B1.1

MIND THE GAP: PATIENTS WITH METASTATIC DISEASE LACK BEHIND IN GAIN IN SURVIVAL

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Background Survival of cancer patients is increasing due to early diagnosis and improved diagnosis (e.g. imaging) and treatment (e.g. immunotherapy). Aim: to determine whether patients diagnosed with metastatic disease benefit from the innovations to the same extent as patients with early stage disease.

Methods from the Netherlands Cancer Registry all cancers diagnosed 1989-2014 were selected. Follow-up was obtained through the municipality register until February 2017. Five year relative survival (RS) was analysed using the Ederer II method and survival gain in patients with and without metastatic disease at time of diagnosis was compared between 1989-1994 and 2010-2014.

Results In all cancers RS increased both in metastatic and in non-metastatic disease, for example in metastatic colon cancer from 4% to 12% (+8%) and in non-metastatic disease from 68% to 81% (+13%). However, a lower gain in 5-year RS was observed in patients with metastatic disease compared to non-metastatic disease in colon (8%-13%=-5%), rectum (-9%), NSCLC (-12%), SCLC (-12%), prostate (-6%), oral cavity (-7%), oropharynx (-11%), hypopharynx (-13%), oesophagus/cardia (-19%), stomach (-6%), small intestine (-16%), liver (-16%), gallbladder (-11%), bile duct (-8%), pancreas (-9%), ampulla of Vater (-11%), thymus (-36%), vulva (-21%), vagina (-8%), corpus uteri (-7%), penis (-6%), kidney (-12%), eye (-6%), adrenal gland (-4%), nasopharynx (-26%), bone (-10%), cervix (-4%), thyroid (-8%), and testis (-5%). Gain in RS was larger in metastatic disease in GIST (+8%), carcinoid (+21%) and nasal cavity (+10%). Only a small difference was observed for larynx(+2%), pyelum/ureter (+1%), breast (-1%), anus (0%), sinuses (-2%), skin (2%), mesothelioma (-1%), ovary (-1%), bladder (-3%), melanoma (-3%) and soft tissue (-2%).

Conclusion Most cancer sites showed less gain in 5-year RS between 1989-1990 and 2010-2014 in patients with metastatic disease than in patients with localized or regional disease. Consequently, the gap between these groups is increasing.

B1.2

EFFECTS OF SPATIAL RESOLUTION ON ESTIMATES OF LUNG CANCER INCIDENCE ATTRIBUTABLE TO PM_{2.5} IN FRANCE

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Background Outdoor air pollution is carcinogenic to humans and is also a leading environmental cause of death. We aimed to estimate the fraction of lung cancer incidence attributable to PM_{2.5} exposure in France, and to illustrate the impact of population density and of the air pollution models spatial resolution on this estimate.

Methods The population attributable fraction (PAF) was estimated using a nationwide spatially refined chemistry-transport model with a 2-km spatial resolution, neighbourhood scale population density data, and relative risk from a published meta-analysis. We assumed a 10-year lag-time between PM_{2.5} exposure and lung cancer incidence. The reference level of PM_{2.5} (10 µg/m³) was based on current WHO air quality guidelines. Lung cancer incidence in adults over 30 years in 2015 was estimated from the cancer registries data. Several sensitivity analyses were conducted: attributing the median exposure to all areas, disregarding population density, and using the 5th percentile of exposure distribution as reference level.

Results Population-weighted median exposure to PM_{2.5} in France in 2005 was 14 µg/m³ and 88% of the population was exposed to a level higher than the guideline value. In France in 2015, 1,468 (~3.6%) new lung cancer cases were attributable to PM_{2.5} exposure. The sensitivity analyses demonstrated that disregarding spatial contrasts in PM_{2.5} exposure or population density would have led to an underestimation of the PAF by up to 7% or 72%, respectively. When the PM_{2.5} reference level was replaced by the 5th percentile of country-scale exposure (4.9 µg/m³), PAF increased to 7.6%.

Discussion/conclusions Air pollution plays an important role in the burden of lung cancer in France. Policy action to reduce the exposure to PM_{2.5} such as for instance pollution permits, regulations or subsidies of alternative energy sources may have substantial benefits to reduce the burden of lung cancer caused by PM_{2.5} exposure in France.

B1.3

ALGORITHMICALLY DEFINING RECURRENCE IN POPULATION-BASED CANCER DATA

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Background Detecting recurrence has been a persistent challenge in cancer registration. With an ever increasing number of patients surviving their cancer treatment, identifying recurrence is becoming crucial for cancer surveillance. Whilst prospectively registering cancer recurrences is difficult, approaches based on identifying 'recurrence-defining' events in routinely collected datasets may hold promise. We have piloted an approach to identify recurrence in a cohort of colorectal cancer patients.

Method Details of 10,122 patients diagnosed with colorectal cancer (ICD-10 C18-C20) at stage II or III in England during 2013 were extracted from Public Health England's cancer registry. Patients were followed up to 31/12/2015. Patients without prior history of malignancy, initially treated with curative intent, and surviving at least 6 months from diagnosis were selected. An algorithm was developed to identify potential recurrence-defining events: either receipt of radiotherapy, chemotherapy, treatment with major surgery or multi-disciplinary team discussion (MDT) 6 months post-diagnosis. Results were then compared against current registry-collected recurrence data to understand the algorithm's success in identifying recurrence.

Results 2,289 (23%) colorectal patients had evidence of recurrence during median follow-up of 40 months. Patients with evidence of recurrence were on average 4 years younger at diagnosis than those without evidence of recurrence (mean/median 66/67 vs 70/71 years, respectively [$p < 0.01$]). Within the recurrence cohort, there was variation in the time to recurrence depending on the event type. Chemotherapy had the shortest time from diagnosis to recurrence with mean/median time of 14/10 months; however, recurrence defined by MDT events occurred nearly 7 months later with mean/median time of 19/17 months. Sensitivity/specificity of the algorithm when comparing to registry-collected recurrence data shows 81%/81% agreement, respectively.

Conclusions We have developed an algorithm for recurrence identification that has high face validity. It can be expanded to other tumour types and will improve our understanding of the prevalence of recurrence.

B1.4

TIME TRENDS IN COLORECTAL CANCER INCIDENCE AMONG YOUNGER ADULTS IN A HIGH INCIDENCE STATE: DISPARITIES BY SUBSITE, AGE, SEX, RACE, ETHNICITY, AND STAGE

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Background Colorectal cancer (CRC) has decreased for several decades as a result of effective primary screening through colonoscopy, but has increased in younger adults recently. We examined time trends in CRC incidence among New Jersey (NJ) younger adults.

Methods NJ CRC frequency counts and percentages by demographic and clinical factors were compared between younger (20-49) and older adults (>50). NJ and U.S. younger adults' annual incidence rates by sex, race, ethnicity and subsite were imported into JoinPoint Regression Program to calculate annual percent changes (APCs) over time and identify points in time when the APCs significantly changed. Time trends among NJ younger adults for three CRC subsites were similarly analyzed.

Results About 182,000 CRC NJ cases diagnosed in 1979-2014 were included. In NJ, younger adults were significantly more likely than older adults to be male, black or of another race, Hispanic, have rectal cancer, and be diagnosed at the late stage. CRC incidence rates in younger adults have significantly increased since the mid-1990s, due to increases in rectal cancer, primarily, and, secondarily, due to increases in proximal colon cancer. The increase in rectal cancer appears to be driven by younger young adults, men, and whites.

Conclusions Further studies are needed to discern specific risk factors for increases in CRC among younger adults. In the meantime, public and clinician education about CRC in young adults, known causes of CRC and CRC symptoms; access to affordable, high quality health care for younger adults; and, careful study of the risks and benefits of lowering the screening age should be considered.

B1.5

EFFECT OF LIFESTYLE FACTORS ON SURVIVAL IN MANTLE CELL LYMPHOMA PATIENTS IN FRANCE

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Background Mantle Cell Lymphoma (MCL) is a rare non-Hodgkin Lymphoma mainly diagnosed at an advanced stage with a poor prognosis. Therapeutic advances have improved the survival of patients included in clinical trials. However, the impact of lifestyle factors on patient's survival is rarely discussed.

Methods From 2008 to 2012, the LYSA Group conducted in France two prospective multicenter clinical trials on Mantle Cell Lymphoma: LM manteau 2010 SA "RiBVD" (N° NCI01457144) and Manteau 2007 SJ "LyMa" (N° NCT 00921414). After a comparison of these patients with population-based data, we investigated lifestyle habits and their impact on survival through a qualitative survey administrated to each volunteer after diagnosis.

Results Out of the 372 MCL patients, the response rate was 54%. The median age was 60 years old [range: 30 – 83] and 77% of participants were men. ECOG performance status equal to zero was observed in 59% of cases and participants had a better prognostic than non-participants (OS 4 years : 90% [85 – 94] and 61% [53 – 68] respectively). Patients who were single or divorced (HR=0.69, 95%CI [0.20 – 2.39]), non-owner of their house (HR=1.00, 95%CI [0.28 – 3.54]), highly educated (HR=0.53, 95%CI [0.17 – 1.62]), with BMI =25 kg/m² tend to have a better survival 4 years after diagnosis, even if significance was not reached. Compared to those with a tanned skin, those who have a clear skin had a lower risk of death (HR= 0.25, 95%CI [0.07 – 0.82]). Alcohol consumption was associated with a poor survival (HR = 1.81[0.58 – 5.71]) but not heavy tobacco smoking.

Conclusion In our analysis, several lifestyle habits seem to influence patient prognostic.

B1.6

A LOCAL COHORT DETECTION FOR CANCER INCIDENCE AND MORTALITY IN OSAKA, JAPAN USING VARYING COEFFICIENT MODEL

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Background Monitoring cancer trend is important to plan and evaluate cancer control policy. Longitudinal cancer trend is mainly constructed from three elements, these are age, period and cohort effect. Generally, it is said that the cohort effect is the most difficult one to identify among them. Recently, the varying coefficient model was proposed as the method to detect local cohort effect which defined as the changing locally effect of the birth cohort. The new method quantify the local cohort effect statistically. The purpose of this study is to detect the local cohort effect and monitor the cancer trends in Osaka with the varying coefficient model.

Methods Cancer incidence data during 1975-2010 were obtained from the Osaka Cancer Registry, and cancer mortality with population data in Osaka during 1968-2013 were obtained from vital statistics departments. We detect the local cohort effect for incidence and mortality using the method with the varying coefficient model proposed by Tonda et al. (2015). The local cohort can be detected as the singular behavior described by Gaussian. We can identify the strongest point and relative risk for cohort effect and affectable interval.

Result For liver cancer, the local cohort effect was detected for male. In incidence, the center of the local cohort effect was the 1931 and relative risk was 2.09. In mortality, the center of the cohort effect was the 1931 and relative risk was the 1.70. We could quantitatively reevaluate the cohort effect for other sites and give an epidemiological interpretation.

Conclusion Quantification of age, period and cohort effect leads to clarifying the mechanism of longitudinal cancer trend. Especially, cohort effect usually show some risk exposure, for example, hepatitis virus. These information are expected to play an important role in the planning and evaluation of cancer control policy.

A2.1

A COMPARATIVE EPIDEMIOLOGICAL ANALYSIS BETWEEN CUTANEOUS AND NON CUTANEOUS MELANOMA IN INDIAN POPULATION

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Background Melanoma though predominantly a malignancy of skin, was also reported in other organs from different parts of the world. The literature on Non Cutaneous Melanoma (NCM) in India is scant. Hence this study aimed at analyzing certain epidemiological attributes of NCM in comparison to those of cutaneous melanoma in Indian population.

Methods Data from 27 Population Based Cancer Registries (PBCR) of National Cancer Registry Program (NCRP) from 1982 - 2014 were analyzed. All registered cases with morphology code M-87203/6 to M- 8774 3/6 (International Classification of Disease, Oncology, Third edition 2000) were extracted. Among them, cases having topography codes of unspecified and secondary sites (C76- C80) were excluded. Topography code of C44 was considered as cutaneous and remaining all topography codes were as non cutaneous melanoma. These cases were taken for further analysis in terms of relative proportions and sex ratio. Similar analysis was also done in the data of Hospital Based Cancer Registries for certain variables.

Results Cutaneous and Non cutaneous melanoma respectively comprised 89 % (n = 2951) and 11% (n= 359) all melanoma in PBCRs (n= 3310). Among NCM, most common sites involved was rectum and anal canal (48%) followed by eye (18%). Mucosal melanoma was predominant (>80%) compared to ocular (<20%). Male : female ratio was similar for cutaneous (1.1: 1) melanoma and NCM (1.2:1). Around 10% of both cutaneous and NCM belonged to 0-34 years age group but in case of ocular melanoma the proportion of such cases was 24% (P<0.05). Proportion of localized tumors was significantly higher in case of NCM (OR =1.22, 95% CI: 1.01 - 1.46) compared to cutaneous melanoma.

Conclusion Epidemiological attributes of cutaneous melanoma and overall NCM were mostly similar although we observed certain differences particularly in age distribution and clinical extent. These findings need to be further investigated.

A2.2

BEYOND EPIDEMIOLOGICAL STATISTICS: COMPREHENSIVE NATIONAL CANCER REPORTS FOR AN INTERNATIONAL AUDIENCE?

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Background Cancer registry data are critical for generating population-based statistics on incidence, prevalence, mortality and survival. Other sources, such as health services data, can provide a more complete picture of cancer's impact. In 2016, the German Centre for Cancer Registry Data produced the first comprehensive national cancer report, focusing on epidemiology, health services, survivorship, prevention, early detection and the national cancer plan. While general standards improve the international comparability of epidemiological statistics, such standards are often lacking for other types of data.

Methods Data from cancer registries, hospital and private practice utilization, national health surveys, epidemiological studies as well as data generated by screening and treatment center certification programs were included. Representatives from patient organizations, clinicians, researchers and other stakeholders in the German health care system also participated in expert interviews. The report has thus far only been published in German.

Results Creating Germany's national cancer report required data and information from many separate sources. Here are selected results based on the example of colorectal cancer: after increasing over many years, age-standardized incidence has been decreasing since 2003/2004. Mortality has been decreasing since the 1990s and is now slightly lower than the EU average. Hospital discharge rates have decreased even more dramatically since 2000. Approximately 35% of women and 25% of men with colorectal cancer treated by a physician in private practice received a psychotherapeutic treatment. Certified cancer centers treated approximately 36% of primary colorectal cases in 2013. An organized colorectal cancer screening program to replace opportunistic screening is currently under development.

Conclusions Comprehensive cancer reporting should go beyond epidemiological statistics and reflect the particular setting from which the data arise. Efforts to standardize reporting practices can be beneficial and should respect the dual needs for nationally relevant and internationally comparable data.

A2.3

USING A NEW STANDARD POPULATION AND ITS IMPACT ON AUSTRIAN CANCER INCIDENCE RATES 1983 TO 2014

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Background Following the recommendation of the European Network of Cancer Registries the Austrian National Cancer Registry moved to the European standard population 2013 for the calculation of age standardized cancer incidence rates. The aim of this work was to compare time series of age standardized rates using the former WHO World Standard Population 2000-2025 and the new European standard population 2013 for all cancers combined and for 23 single cancer sites.

Material & Methods Based on the data derived from the Austrian National Cancer Registry the impact of the standard population on Austrian cancer incidence rates was discussed based on descriptive analyses.

Results As a consequence of the new standard population the cancer incidence rates for most of the cancer sites were about twice as high as before. However, this does not reflect a higher risk of developing cancer but solely the new standard population. The factor by which the results changed was dependent on cancer site and the mean age at diagnosis. Incidence rates for cancer sites with a higher age at diagnosis (70+) changed most (gastric cancer, colon cancer, cancer of the liver and the pancreas, bladder cancer, multiple myeloma), whereas rates for cancers occurring in young ages did not change that much (melanoma of the skin, brain cancer and cancer of the thyroid). The rates for hodgkin lymphoma did merely change a little (mean age at diagnosis 44 years), the rates for testicular cancer were even lower using the European standard population 2013 (mean age at diagnosis 39 years).

Conclusion In conclusion, it is stated that the basic descriptive trends of the Austrian age standardized cancer incidence rates are independent of the used standard population, which is in line with international findings.

A2.4

SURVEILLANCE OF WORLD-WIDE TRENDS IN CANCER SURVIVAL UP TO 2014 (CONCORD-3)

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Background In 2015, the CONCORD programme established world-wide surveillance of population-based cancer survival trends, with data provided by 279 cancer registries in 67 countries on 26 million patients diagnosed with one of 10 common malignancies during 1995-2009. CONCORD-3 will extend survival trends to 2014 for 15 malignancies: oesophagus, stomach, colon, rectum, liver, pancreas, lung, melanoma of the skin, breast (women), cervix, ovary and prostate in adults (15-99 years), and leukaemia, lymphomas and brain tumours in both adults and children (0-14 years).

Methods The CONCORD-3 database will include incidence and follow-up data from population-based registries in up to 70 countries for up to 30 million patients diagnosed during the 15 years 2000-2014. Standardised quality control procedures are applied to all data sets; errors are checked with the registry concerned. Net survival, i.e. the probability of surviving cancer after controlling for competing risks of deaths (background mortality), will be estimated with the Pohar Perme estimator. To correct for background mortality, we will use life tables of all-cause mortality by single year of age, sex, calendar year (and race) in each country or region. Survival estimates will be age-standardised with the International Cancer Survival Standard weights.

Results We will present preliminary results on world-wide patterns of net survival up to 5 years after diagnosis for adults diagnosed with one of these 15 malignancies during 2000-2014. We will also present 20-year survival trends since 1995.

Conclusion The survival estimates produced by the CONCORD programme will be used in up to 70 countries in the evaluation of health system performance for the quality of cancer care. This will facilitate comparison of the overall effectiveness of health systems as a basis for informing national and global policy for cancer control.

A2.5

COMPARING POPULATION-BASED INTERNATIONAL CANCER SURVIVAL ESTIMATES

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Background International cancer survival estimates have been conventionally presented in ranked bar charts with confidence intervals. However, it is not easy to identify countries with outstanding performance. We propose presenting estimates using funnel plots, with 'target' and 'control limits' constructed using a random effects statistical model.

Methods Were developed using five-year age-standardised survival estimates from EURO-CARE-5 for 29 countries and 40 cancer sites. An iterative weighted least squares method was developed to estimate unbiased random-effect parameters to estimate target and control limits for funnel plots. A 'heat-plot' summarised the results of the funnel plots for all cancers sites.

Results In moderate- to large-sized cancer sites, the random-effects model produced near constant-width control limits (CLs) indicating that, once a 'sample' size threshold was reached, the between country or random effects variation determined the CLs. In a number of cancer sites, the complementary log-log transformation was better at normalising the distribution of estimates. The heat-plots highlighted countries and regions of Europe with consistent survival outcomes across different cancer sites.

Conclusion The random-effects approach, both in theory and practice, appears to be the appropriate method to summarise international cancer survival variation, as validated by the heat maps. It provides an unbiased estimate of mean and variance of country survival. The complementary log-log transformation ensures control limits are within 0 to 1 bounds. Funnel plots can be used diagnostically to assess the period of diagnosis required to properly measure international variation in specific cancer sites.

A2.6

POPULATION-BASED CANCER SURVIVAL IN CANADA AND THE UNITED STATES: COMPARISON BY SOCIO-ECONOMIC POSITION

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Background and purpose Results from CONCORD-2 showed that 5-year survival in Canada and the United States were comparable for most cancers, and among the highest in the world for patients diagnosed 1995 through 2009. Literature using U.S. SEER and Canadian provincial data suggests a Canadian-advantage in survival among lower socio-economic (SE) groups and a US-advantage among higher SE groups. CONCORD-2 data covering 100% of the Canadian population and 80% of the US population will be used to explore this hypothesis.

Methods Data for cancer patients diagnosed 2001-2009 were from 34 US statewide registries and 10 Canadian provincial registries. We estimated 5-year net survival for selected cancers by age, gender, calendar year, country and neighborhood-level income quintiles (Canada) and county-level SES index (US).

Results In Canada, the survival difference between highest and lowest income quintiles are: 5.4% for ovarian cancer; 5.1% for female breast cancer; 4.3% for prostate cancer; 2.8% for lung cancer; and <1.0% for cancers of the stomach and cervix, and children with acute lymphoblastic leukemia. This analysis will be updated to include results from the US and a comparison of results between Canada and the US.

Conclusions Health care delivery differs between Canada and the United States. Exploring the relationship between SE-position and population-based cancer survival may help inform cancer control efforts in both countries.

B2.1

CHILDHOOD, ADOLESCENT AND YOUNG ADULT
CANCER INCIDENCE IN JAPAN IN 2009-2011

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Background Little is known about cancer incidence among children and youths in Japan. We aimed to describe cancer incidence in Japan focusing on childhood, adolescence and young adulthood (AYA). Cancer incidence data were obtained from the Monitoring of Cancer Incidence in Japan (MCIJ) project.

Methods For the 2009-2011 incidence, the data were collected from 40 prefectures, of which data from 27 prefectures meeting quality standards were analyzed (population coverage: 38.6%). Cancers diagnosed in 0-39 years of age were classified according to the International Classification of Childhood Cancer (ICCC; version 3). Crude incidence rates of cancer (including benign or behavior-unknown brain tumors) were 122.7, 142.2, 310.7, and 910.6 for the 0-14, 15-19, 20-29, and 30-39 age groups, respectively (per million population).

Results The childhood and AYA cancer incidence rates in the present study were lower than those in the United States. The lymphoma (particularly Hodgkin lymphoma), astrocytoma, malignant renal tumor, thyroid cancer, and melanoma incidence rates in Japan were less than half of those in the United States. On the other hand, the incidence rate of malignant ovarian germ cell tumor was almost two times higher in Japan than in the United States.

Conclusion When compared with the data for Asian/Pacific islanders in the United States, the incidence rates of Hodgkin lymphoma and thyroid cancer in the present study were approximately half of those in Asian/Pacific islanders in the United States. The incidence rates of childhood cancer observed in the present study were similar to those reported in Britain, Germany, and Republic of Korea.

B2.2

PRE-REGISTRY DATA STATUS IN A LEVEL 3 CARE
HOSPITAL OF PARAGUAY

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Background Cancer registries are information systems that have a well-established but continuously improving methodology. This dynamism per se allows improving data quality in the environment in which is applied. The aim of this study was to determine the state of the art of data recollection in a single institution before setting an institutional-based registry up.

Methods The study approach was qualitative. Patients with hospital admission in 2015 and diagnosed with cancer were identified in the department of statistic. Clinical records were retrieved at the Central archive. Managers of both departments were interviewed to determine the source, flow and management of the data and to identify barriers. Records were reviewed for data completeness.

Results A flowchart of medical records from admission to discharge was developed. Barriers were identified at all levels as follow: There are no electronic case files; These are identified with a correlative numbering that can change among hospital services and no primary key is required which contributes to duplication and loss of traceability; physical and electronic data bases just include patient's name, clinical file number, primary diagnosis, and hospital service; primary diagnoses are collected daily by oral communication among resident and statistic department representative and no final control or feedback are required; anatomic pathology files are electronic but cannot be retrieved online and the department is located far away from the hospital; clinical files are outdated and unstandardized; final diagnosis and consistent classification according to ICD are not assessed before final storing of clinical files.

Discussion/conclusion Barriers were identified at all levels. Qualitative approach to analyze the status of data management is mandatory before to begin a registry in countries without a successful previous experience. Improving the quality of data allows not only effective cancer registration but ensure upscaling in patients' quality care.

B2.3

PROGRESSION TO METASTATIC COLORECTAL CANCER IN AN AUSTRALIAN POPULATION

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Background No previous Australian population-based studies have described or quantified the progression of colorectal cancer (CRC) to metastatic disease. We describe patterns of progression to metastatic disease for an Australian cohort diagnosed with localised or regional CRC.

Methods All non-metastatic CRC cases in the New South Wales Cancer Registry diagnosed during 2000-2007 were followed to December 2011 for subsequent metastases (identified by subsequent disease episode notifications) or CRC death. Cox regression was used to identify factors associated with metastatic progression.

Results After a median 5.3 years follow-up, 26.4% of the 12757 cases initially diagnosed with localised or regional colon cancer had developed metastatic disease, as had 29.5% of the 7154 rectal cancer cases. For both cancer sites, risk of metastatic progression was significantly higher for those initially diagnosed with regional disease (adjusted hazard ratio [aHR] 3.49 for colon, 2.66 for rectal cancer), and for older cases (e.g. aHR for >79 years vs <60 years: 1.38 for colon, 1.69 for rectal cancer). Risk of disease progression was significantly lower for females (aHR 0.90 for colon, 0.84 for rectal cancer), and varied by histology type, with much higher risk for signet ring cell carcinoma (aHR 2.21 for colon cancer and 3.72 for rectal cancer), but significantly lower risk for specified adenocarcinoma and other specified carcinoma compared to unspecified adenocarcinoma. For colon cancer, the risk of disease progression decreased over time (aHR 0.97 for each calendar year of diagnosis). For rectal cancer, risk of metastatic progression was significantly higher for those living in more socioeconomically disadvantaged areas compared with those in the least disadvantaged area.

Conclusions An understanding of the variation in risk of metastatic progression is useful for planning health service requirements, and can help inform decisions about treatment and follow-up requirements for colorectal cancer patients.

B2.4

DIVERSE INCIDENCE AND SURVIVAL TRENDS FOR COLORECTAL CANCER SUBSITES IN ESTONIA

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Background Survival for colorectal cancer in Estonia has been among the lowest in Europe. Population-based organized screening program is still in a pilot phase. The study aimed to examine the incidence and survival trends of colorectal cancer in Estonia with specific focus on sidedness, age and stage.

Methods Estonian Cancer Registry provided data on all cases of invasive colorectal cancer diagnosed in 1995-2014. Age-standardized incidence rate (ASIR) was calculated for colon cancer (ICD-10 C18) and rectal cancer (C19-20), and the following subsites: right-sided colon (RCC, C18.0-18.4), left-sided colon (LCC, C18.5-18.7), other colon (C18.8-18.9). Age-standardized 5-year relative survival ratios (5RSR) were calculated using cohort analysis for 1995-1999, 2000-2004 and 2005-2009, and period analysis for 2010-2014.

Results The ASIR for colon and rectal cancer increased slightly over the study period. In subgroup analyses, a clear upward trend was apparent only for RCC, and for age group =70 years. Overall, the 5RSR for colon cancer increased from 50% (95% CI 47-53) in 1995-1999 to 59% (57-62) in 2010-2014; for rectal cancer, the respective change was from 38% (34-41) to 56% (53-59). The largest improvements were seen in age groups <60 years and stage III disease. Survival gain over the study period was larger for LCC (11 percent units) than for RCC (7 percent units). In 2010-2014, the highest 5RSR (62%) was seen for LCC (58% for RCC; 41% for other colon). Stage distribution did not differ between RCC and LCC in 2010-2014, with around 30% of cases diagnosed at stage IV. RCC patients had poorer survival than LCC patients for all stages, except stage II.

Conclusions Incidence and survival trends of colorectal cancer varied across subsite, age and stage groups. Implementation of a quality assured screening program with high adherence would help to improve survival, and reduce incidence in the long term.

B2.5

CANCER SURVEILLANCE FOR CANCER CONTROL IN DPR KOREA

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Background Oncology Institute, Academy of Medical Science is the central Institute for cancer prevention & control and National Cancer Registry (NCR), DPR Korea. In 2012 it started PBCR preliminarily in Pyongyang and with some experience in this field NCR was established in 2015. NCR is responsible for collection and management of nationwide registration of cancer data, providing technical support to the regional cancer registries, training for cancer registrars and annual cancer statistics.

Methods Surveillance was done with "active" method, that cancer registrars visit the population directly.

Results Annually, the number of newly diagnosed cancer cases is about 3200 and about 2300 cases from death in Pyongyang.

The incidence rates of cancer in 2012, 2013, 2014 were respectively 101.5, 100.97, 103.14 per 100 000, and the mortality were 72.8, 72.97, 72.78 per 100 000. The five highest incidences are the cancers of stomach, breast, liver, lung, and uterine. The incidence and mortality are gradually trending upward. And in 2016 cancer survival in Pyongyang was also followed up for SurvCan-3. The 5-year survival rates of stomach cancer, hepatoma, lung cancer, breast cancer, and uterine cancer were respectively 21.6%, 11.2%, 12.3%, 50.7%, and 38.6% and median survival months were 19.9, 11.8, 13.1, 37.3, 38.9 respectively. It showed they were not so high in stomach, liver, and lung cancers whereas vice versa in breast cancer and uterine cancer.

Conclusion PBCR started with Pyongyang and should be extended in the new regional cancer registry. We should study the etiology with the registration data of cancer and contribute to the control strategy of cancer. However, we are getting difficulties in registration of topographical and morphological code by ICD-O-3 and TNM classification. And the most important issues are also to ensure quality and the use of data. We will have to overcome the difficulties in PBCR, and will contribute to the planning, implementation, monitoring of National Cancer Control Programmes (NCCP).

B2.6

TIME TREND IN THYROID CANCER INCIDENCE IN IZMIR, TURKEY

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Background Thyroid cancer (TC) is the second most frequent cancer in women in Izmir. Incidence of TC has continuously increased in last three decades all over the world except on Africa. We aim to present time trends in TC incidence in Izmir.

Methods We performed time trend analysis of TC incidence for 1993-2014 using Izmir Cancer Registry database. Age Standardized Incidence Rates (ASIRs per 100,000), Annual Percent Changes (APCs) were calculated for overall and stratified TCs by sex, age groups, histological subtypes using Joinpoint Regression. The percentages of subgroups for stage at diagnosis (SEER Summary Stage) were calculated.

Results ASIRs were 0.3 and 7.6 in men, 2.3 and 29.1 in women for 1993 and 2014 respectively (8415 cases). Incidence rates showed increasing trends both in men and women significantly in 1993-2014. In females there were significant increasing trends in all periods with the highest APC 33.8 ($p < 0.001$) in 2002-2006 period. In males APC was 15.8 ($p < 0.001$) in 1993-2012. Papillary carcinoma was the most common histological type and showed significant increasing trends with 10.0 and 10.1 ($p < 0.05$) APCs in females and men respectively. 15-49, 50-64 and 65+ age groups showed significant increasing trends in all periods while the highest APC was 35.1 for 15-49 in 2002-2006. The proportion of the localized cases increased from 36.8% to 83.4% while the distant cases decreased from 15.8% to 1.6% between 1993 and 2014.

Conclusion TC incidence rates showed significantly increasing trends in whole period, however APCs in almost all subgroups were striking in 2002-2006 refers to the first era of the health care transition program resulted with the sharp increase of the consultation rates. Considering the improvement over time in the stage at diagnosis as well, we comment that most of the increasing trend in TC incidence might be related with the increment in the diagnosis.

A3.1

SURVEY DATA VERIFIES HIGH QUALITY OF CANCER REGISTRY DATA IN ENGLAND

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Background The Life After Prostate Cancer Diagnosis (LAPCD) project is a UK wide postal survey of men with prostate cancer. Public Health England (PHE) cancer registry data were used to identify the cohort of eligible men in England. Once men have been sent the survey, a helpline was available in case of problems. A number of men – 700 from 54,000 surveyed - indicated that they did not have cancer.

Method Details of all men who called the helpline were confidentially passed to PHE. Cancer registration officers checked the system for confirmation of diagnosis, and then contacted hospital Trusts to verify the data and inform them about the men who had queried their diagnosis.

Results Preliminary results from 45 Trusts are presented, covering 271 men. Of these:

- 29 men do not have prostate cancer: 21 of these had their diagnosis changed by the Trust after the registry was notified, and four were data entry errors.
- Five patients have NOT been told about their diagnosis
- In six cases it is unknown if the patient was told about their diagnosis

The Trusts confirmed that of the diagnoses:

- 56% were told by a doctor
- 6% were told by nurse
- 5% where Trust don't know who told the patients

83 missing data items have been collected for cancer registration:

- 10 stage
- 32 PSA level at diagnosis
- 41 treatments records

Conclusion Survey data where cancer patients are contacted for follow up information can validate cancer registry accuracy and completeness. Only four cases of registry error were found. Systems to highlight when Trusts have amended a diagnosis can reduce misclassification to a minimum; and these are being pursued. It is notable that patients are not always aware of their cancer diagnosis even after treatment.

A3.2

RELATIVE REDUCTION OF ADVANCED-STAGE BREAST CANCER IN REGULAR PARTICIPANTS OF A DIGITAL MAMMOGRAPHY-SCREENING-PROGRAM IN GERMANY

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Background In North Rhine-Westphalia (NRW), the largest federal state of Germany, a population-based mammography-screening-program (MSP) started in 2005.

Methods All NRW-resident women aged 50 to 69 years were invited for an initial screening examination (IE) between 2005 and 2009. Eligible women were further invited every second year for a subsequent screening examination. We estimated the relative risk reduction (RRR) for incident advanced-stage breast cancer (AS_BC, stage UICC II+) comparing the IE with the first (FSE) and second subsequent screening examination (SSE) in regular MSP participants. This RRR is commonly considered a valid surrogate for reduction in breast cancer mortality.

Based on the recommendations of the European Guidelines, we assessed the incidence of AS_BC occurring among MSP participants in the 24-months period after a preceding screening examination with no signs of malignant lesions. The cumulative AS_BC incidence per period - obtained as the sum of interval cancer incidence and detection rate at the next regular screening examination - was related to the average incidence of AS_BC in the period 2000 – 2004 (prior to screening start). Missing values for tumor stage were replaced using multiple imputations.

Results Of 1,190,188 MSP participants without malignant lesions at the IE, 498,033 appeared within 24-months to the FSE. The age-standardized incidence of AS_BC was 277.9/100.000, resulting in a RRR of 20.6%. Of 495,238 women without malignancies in the FSE, 208,565 attended the SSE. The incidence of AS_BC was 264.1/100.000 (RRR = 24.5%). The observed RRR of AS_BC in regular MSP participants in NRW was about 25% after the second screening round.

Conclusion The size of the RRR is suggestive of an expectable reduction in breast cancer mortality. However, methodological shortcomings, e.g. the background incidence as a time-inert reference or the restriction of regular participation to 24 months, require further statistical elaboration to increase the validity of the RRR.

A3.3

BREAST CANCER IN SOUTH-EASTERN EUROPEAN COUNTRIES SINCE 2000: RISING INCIDENCE AND DECREASING MORTALITY AT YOUNG AND MIDDLE AGES

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Background Marked variations exist in the incidence and mortality trends of major cancers in South-Eastern European (SEE) countries which have now been detailed by age for breast cancer (BC) to seek clues for improvement.

Methods We brought together and analyzed data from 14 cancer registries (CR), situated in SEE countries or directly adjacent. Age-standardized (ASRW, world standard) and truncated incidence and mortality rates during 2000-10 by year and for four age groups, were calculated. Average annual percent change of rates was estimated using Joinpoint regression.

Results Annual incidence rates increased significantly in countries and age groups, by 2-4% (15-39 years), 2-5% (40-49), 1-4% (50-69) and 1-6% (at 70+). Mortality rates decreased significantly in all age-groups in most countries, but increased up to 5% annually above age 55 in Ukraine, Serbia, Moldova and Cyprus. The BC data quality was evaluated by internationally agreed indicators which appeared suboptimal for Moldova, Bosnia and Herzegovina, and Romania.

Conclusion The observed variations of incidence trends reflect the influence of risk factors, as well as levels of early detection activities (screening). While mortality rates were mostly decreasing, probably due to improved cancer care and introduction of more effective systemic treatment regimens, the worrying increasing mortality trends in 55+ age groups in some countries have to be addressed by health professionals and policymakers. In order to assess and monitor the effects of cancer control activities in the region, the CRs need substantial investments.

A3.4

ESTIMATION OF INCIDENCE RATES FOR FEMALE BREAST CANCER BASED ON GENETIC AND LIFESTYLE-RELATED RISK FACTORS

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Background Individual disease risk is affected by personal genetic backgrounds and lifestyles. Knowing individual genetic risk would be a motive for improving life-styles, and life-style changes could lead to prevention or early detection of the disease. The aim of this study was to evaluate the impact of lifestyle modification by genetic risk groups on breast cancer incidence.

Methods We studied the impact of lifestyle modifications using a simulation model. Our simulation model used a Markov process to calculate breast cancer incidence and distribution of extent of disease at diagnosis. We used following risk factors for breast cancer: age, genetic risk factors, parity, body mass index (BMI), physical exercise, alcohol consumption and screening behavior. Transition probabilities between statuses were determined using incidence rate based on population cancer registry and relative risks obtained from previous studies. The prevalence of each risk factor was obtained from nationally representative survey data or large-scale cohort study data. Genetic factors were classified into three risk groups: low (RR=1.0), moderate (RR=1.4), high (RR=3.9). To evaluate the impact of lifestyle modifications, we simulated scenarios based on the changes in body mass index, physical exercises and alcohol consumption habit.

Results and discussion In high genetic risk group, lifestyle modification decreased 10-year cumulative risk by 5.0 %. However, its' risk remained high compared to the risks for the other risk groups. Therefore, early detection by screening as well as lifestyle modification was much important for high genetic risk group. In terms of population impact, it was not so large that the effect of lifestyle modification among high genetic risk group on incidence because of small prevalence of high genetic risk. Modification of BMI among moderate risk group had the biggest impact on breast cancer incidence at population level. Our simulation results were useful for designing individually-tailored prevention program in accordance with their incidence risk.

A3.5

NATIONWIDE COMPREHENSIVE GASTRO-INTESTINAL CANCER COHORTS: THE 3P INITIATIVE

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Background Increasing sub-classification of cancer patients due to more detailed molecular classification of tumors and consequent efforts towards personalized cancer treatment require new and innovative research designs. We present three comprehensive nationwide cohorts enrolling pancreatic, esophageal/gastric, and colorectal cancer patients. Multidisciplinary collection of clinical data, tumor tissue, blood samples and patient reported outcome measures (PROMs) with a nationwide coverage provides the infrastructure for future and novel trial designs, and facilitates research by national and international research groups to improve outcomes of gastrointestinal cancer patients.

Methods All patients aged 18 years or older with pancreatic, esophageal/gastric or colorectal cancer are eligible to participate. Patients provide informed consent for: 1) reuse of clinical data; 2) biobanking of primary tumor tissue and blood samples; 3) being informed about relevant newly identified genomic aberrations; 4) longitudinal PROMs collection; and 5) being invited for future interventional studies.

Results The clinical data of included patients are retrieved from the Netherlands Cancer Registry (hosted by the Netherlands Comprehensive Cancer Organisation) and linked by a unique study registration number to the collected tissue, blood and PROMs. Additional clinical data are collected in the context of specific projects for predefined groups of patients. Other existing best practices are used to collect the biomaterial (the Parelsnoer Institute) and PROMs (PROFILES). To ensure a sustainable and secure use of the data, a tumor specific scientific committee evaluates requests to access the data and material.

Conclusion The number of participating centers and subsequently the inclusion rate is steadily increasing (>50% national hospital coverage expected end 2017). Currently, over 20 studies make use of the infrastructure provided by the three cohorts. Thus, comprehensive nationwide cancer cohorts are feasible and surpass the limitations of classic study designs. With these initiatives, novel and innovative studies can be performed in an efficient, safe, and comprehensive setting.

A3.6

HOSPITAL OF DIAGNOSIS AFFECTS THE PROBABILITY OF CYSTECTOMY AND SURVIVAL OF PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER.

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Introduction Since 2010 the surgical treatment of bladder cancer started to be centralized in hospitals that fulfil the volume criteria as set by the Dutch Association of Urology. However, patients with bladder cancer can be diagnosed in every hospital. According to the Dutch guideline, the standard treatment for patients with muscle-invasive bladder cancer is removal of the bladder, i.e. cystectomy. The aim of this study is to evaluate the effect of hospital of diagnosis on the probability of cystectomy and its impact on survival.

Methods Patients diagnosed with muscle-invasive bladder cancer (MIBC; T2-4a, No/X, Mo/X) between 2009 and 2014 were identified through the Netherlands Cancer Registry. Multilevel logistic regression analysis was used to investigate the probability of undergoing cystectomy by hospital of diagnosis. Cox proportional hazard regression analysis was used to assess the effect of variation in the probability of undergoing a cystectomy between hospitals on survival.

Results A total of 6,325 MIBC patients were included in the study. The probability of undergoing a cystectomy differed significantly by hospital of diagnosis in all periods ($p < 0.0001$ in 2009-2010 and 2011-2012, $p = 0.004$ in 2013-2014). The variation in the more recent period (2013-2014) was lower compared to 2009-2010 (Intraclass correlation coefficient, 2.9% versus 5.4%). Survival of patients who were diagnosed in the tertile of hospitals with the highest probability of patients undergoing cystectomy was 11-13% better compared to survival of patients diagnosed in the tertile of hospitals with the lowest probability of cystectomies.

Discussion Variation in probability of undergoing a cystectomy exists between hospitals of diagnosis but decreased over time. However, this variation still affects survival. This indicates that clinical management of potentially curable bladder cancer patients can be improved.

B3.1

TRENDS IN INCIDENCE, SURVIVAL AND MORTALITY OF CHILDHOOD AND ADOLESCENT CANCER IN AUSTRIA, 1994-2011

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Background This is the first study on trends in cancer incidence, survival and mortality for children and adolescents in Austria. The aim was to assess to what extent progress has been made in Austria since childhood cancer treatment has been centralized in the 1990s and neuroblastoma screening took place in 1991-2003.

Materials & Methods All malignant neoplasms and non-malignant tumours of the Central Nervous System (CNS) in patients aged <20 years and diagnosed in 1994-2011 (N=3,582 children: 0-14 years; N=1,842 adolescent: 15-19 years) were derived from the Austrian National Cancer Registry. Incidence and mortality trends were evaluated using average annual percentage change (AAPC). Observed survival rates were calculated based on follow-up until December 31st 2013 and changes over time were evaluated applying Poisson regression modelling.

Results Childhood cancer remained stable with 182 cases per million in 2011, but rose among girls by 1.4% (95% CI: 0.1, 3.6) annually. Overall, non-malignant CNS tumours and Non-Hodgkin Lymphoma increased. Neuroblastoma increased to 22.5 per million children in 2002 followed by a decline to 13.8 in 2011. Adolescent cancer rose by 1.5% (95% CI: 0.4, 2.6) annually, from 182 cases per million in 1994 to 269 in 2011, mainly due to an increase of leukaemia, non-malignant CNS and epithelial tumours. Five-year survival improved by 5-7% reaching 86% for both groups (p<.05). Mortality declined by -2.4% (95% CI: -3.7, -1.2) among children and -2.0% (95% CI: -4.6, 0.5) among adolescents. The strongest decline was seen for childhood leukaemia.

Conclusions Progress is demonstrated by improved survival and declined mortality most likely related to improved diagnostic techniques, more effective therapeutic regimes, supportive care and central advisory function of experts in the Austrian paediatric oncology. Increases of not notifiable non-malignant CNS tumours were caused by the introduction of Austrian Brain Tumour Registry since 2005.

B3.2

MECHANISM AND POSSIBILITIES OF THE ELECTRONICAL CANCER REGISTRY IN BADEN-WÜRTTEMBERG, GERMANY

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Background Concerning geographical size as well as number of inhabitants (11 million) Baden-Württemberg is the third biggest state of the Federal Republic of Germany.

Methods A law concerning cancer registry in Baden-Württemberg (CRBW) was passed 2006, making registration of newly diagnosed cancer, its treatment and follow-up compulsory for all physicians. The clinical-epidemiological cancer registry in Baden-Württemberg was established stepwise, obliging different facility types successively to document and report cancer cases. Since October 2011 a statewide obligation to report information ranging from diagnosis over treatment to follow-up is established.

Results As a novelty in Germany, all notifications must be exclusively transmitted electronically. Reporting physicians have the possibility of entering the data via an online portal or over an interface with the medical accounting file. Pathologists have a special position: they can upload the pathology report electronically and submit it as free text. CRBW employees subsequently encode the information according to ICD-O/ICD-10/TNM. A system for automatic processing of pathology reports is currently established. Multiple notifications per case will be linked automatically to generate a best-of dataset per patient.

Conclusions The electronic documentation of new diagnoses, therapy and course of disease is a win: win situation for physicians and registries: while the electronic recording of data has synergic effects with other routine procedures within the medical setting it also provides a structured, uniform dataset. The latter will minimize tedious reading and analyzing of medical reports. Furthermore each reporting doctor has the possibility of receiving a health record concerning the cancer disease which also includes reports entered by other physicians as well as follow-up information via the cancer registry portal. This feed-back will represent an important benefit for the physicians and is crucial for, but also relies on high quality reporting motivation.

B3.3

SMOKING-ATTRIBUTABLE BURDEN OF CANCER ACCORDING TO SOCIOECONOMIC POSITION IN FRANCE

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Background Smoking is a major preventable cause of lung cancer as well as of a range of other cancers. Although smoking prevalence remained stable between 2000 and 2010 in France, large differences in tobacco consumption were observed between socioeconomic groups. Smoking is increasingly concentrated among the most deprived individuals leading to increasing socioeconomic inequalities in smoking-related cancer incidence. We aimed to estimate the smoking-attributable cancer burden according to socioeconomic position in France.

Methods Tobacco-related cancer cases – lip and oral cavity, oropharynx, nasopharynx, oesophagus, stomach, colorectum, liver, pancreas, larynx, lung, cervix uteri, ovary (mucinous), kidney and renal pelvis, bladder and acute myeloid leukaemia – by sex, age group and European Deprivation Index (EDI) among people aged 30–74 between 2006 and 2009 were obtained from cancer registries in 11 French geographical regions. The smoking-attributable burden of cancer according to EDI was estimated applying the population attributable fraction (PAF). The PAF was computed by Peto-Lopez method.

Results The proportion of tobacco-related cancers attributable to smoking increased with increasing level of deprivation. The PAF increased from 56% (the least deprived EDI quintile) to 69% (the most deprived EDI quintile) among men and from 26% to 38% among women. In total, 28% of the excess tobacco-related cancer cases in the 4 most deprived EDI quintiles in men and 43% in women were due to an increased smoking consumption in these 4 EDI quintiles (compared to the least deprived EDI quintile).

Discussion/conclusions A substantial smoking-attributable burden of cancer by socioeconomic position was observed in France. The results highlight the need for policies reducing tobacco consumption. More comprehensive interventions integrating the various dimensions of health determinants and proportionate according to socioeconomic level may essentially contribute to the reduction of socioeconomic inequalities in cancer.

B3.4

EVALUATION OF DATA QUALITY BY PATIENTS' AGE IN EUROPEAN REGISTRIES PARTICIPATING IN THE ENCR-JRC PROJECT

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Background An association between a patient's age and data quality indicators has been reported in cancer registries' (CRs) data. The objective of the study was to preliminarily assess such a pattern in CRs that participated in the "Incidence and Mortality in Europe" project, launched in 2015 by the European Network of Cancer Registries (ENCR) together with the European Commission's Joint Research Centre (JRC).

Methods Data from 115 general population-based CRs participating in the ENCR-JRC project were included. As a first step, the internal consistency of the data was checked with the JRC-ENCR Data Quality Check Software. Afterwards, the following data quality indicators were calculated: percentage of death certificate only (DCO) cases, percentage of morphologically verified (MV) cases, and mortality-to-incidence ratio (M/I).

Results A total of 24,532,398 malignant cases were included in the analysis. Indicators in older age groups showed lower standards, particularly for some sites. In Western Europe, for instance, liver cancer DCOs were 13.6% in the age range 25-59, 20.0% in the age range 60-79, and 39.2% in the group of 80+; in Southern Europe these percentages were 2.4%, 2.9% and 5.1%, respectively. The same gradient was observed for the MV indicator: for instance, in Eastern Europe MV percentages for lung cancer in age classes 25-59, 60-79 and 80+ were 76.0%, 63.5% and 36.4% and, in Southern Europe 86.3%, 80.9% and 61.3% respectively. This pattern is confirmed also for the M/I ratio, which was 1.1, 1.2, 1.5 in the three age groups for liver cancer in Eastern Europe, and 0.7, 0.9, 1.0 in Northern Europe.

Conclusions The overall quality of data in European CRs can be considered satisfactory, and the results from European sub-regions are comparable, although with some heterogeneity. A preliminary analysis by age group showed potential data quality issues for older ages that should be further assessed.

B3.5

FACTORS AFFECTING LENGTH OF STAY IN HOSPITAL AFTER SURGERY FOR HEAD AND NECK CANCER: EXPLORING ROUTINE DATA

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Background Hospital length of stay (LOS) after surgery is a major contributor to the overall cost of care. We carried out a national, population-based exploratory study of sociodemographic, clinical, and health service related factors affecting LOS after resection of SCC of the head and neck.

Methods Cancer registry data on patients with carcinoma of the oropharynx/larynx were identified and linked with hospital in-patient discharge records (HIPE). HIPE data was explored to complement registry clinical and treatment data. Type of tumour-related surgery, presence/absence of plastic reconstruction, tracheostomy, gastrostomy and hospital-acquired infections (HAIs) were extracted from HIPE. Associations between clinical (e.g., surgery type, neoadjuvant chemoradiation), health service factors, and LOS were investigated by using negative binomial regression.

Results Variables associated with prolonged LOS included tracheostomy (neck dissection+tracheostomy versus neck dissection only: incident rate ratio [IRR] 2.66; 95% confidence interval [CI] 2.01-3.50), medium LOS 32 and 8 days respectively; postoperative infection (medium LOS of 34 days, IRR 2.26; 95% CI 1.94-2.62); and neoadjuvant radiotherapy (IRR 2.15; 95% CI 1.64-2.82). Advanced stage, gastrostomy, and reconstruction were also associated with prolonged LOS.

Conclusions The linkage between HIPE and registry data was fundamental to identify tracheostomy and postoperative infection as major determinants of prolonged length of stay.

B3.6

CENTRALISATION OF CANCER SURGERY AND THE IMPACT ON PATIENTS' TRAVEL BURDEN

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Recent years have seen increasing trends towards centralisation of complex medical procedures, including cancer surgery. The impact of these trends on patients' travel burden is often ignored. This study charts the effects of different scenarios of centralizing surgery on the travel burden for patients with cancer of the digestive tract, particularly among vulnerable patient groups. This study included all surgically treated Dutch patients with colorectal, stomach or oesophageal cancer diagnosed in 2012–2013. After determining patient's actual travel burden, simulations explored the impact of continued centralisation of cancer surgery under four hypothetical scenarios. Using multivariable regression analyses the potential effects on travel burden for different patient groups, based on age and classes of socioeconomic status (SES), were assessed. Compared to patients' actual travelling, simulated travel distances under relatively 'conservative' scenarios did not necessarily increase, most likely due to current hospital bypassing. For some cancer types, under more extreme scenarios travel distances would be significantly increased for older patients (>75 years) and those with a low SES. Given the potential impact on vulnerable patients' travel burden, our analysis warrants thorough consideration of non-clinical effects of centralisation in health policy.

A4.1

RELEVANT FEATURES FOR DETECTION OF TEST RESULTS IN WRITTEN MEDICAL REPORTS

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Background The Belgian Cancer Registry annually receives over 2 million written reports from anatomo-pathology laboratories. The goal of the present work is to explore the possibility to automatically analyse such reports using text mining, aiming to speed up and improve the quality of data processing. Text mining requires transforming a text into numbers, called “features”. This work investigates which type of features is the most relevant to detect test results in written reports.

Methods Fifty-seven reports written in French, collected from 24 Belgian laboratories were split into 1,250 sentences. The sentences were then manually annotated regarding the presence/absence of test results for high risk human papillomavirus (HPV) infection. Eight types of features were extracted for each sentence, including counts of one and two-word sequences and lexicographic similarities between sentences. The computation of these features was performed with and without grouping words with similar meanings, resulting in 45,238 features for each sentence. Only the 9,785 features concerning at least 3 sentences were further processed. Information gain and chi-squared value were used as measures of feature relevance.

Results Ninety-eight of the 100 most relevant features were lexicographic similarities between the sentences and other sentences containing HPV test results. Such features allow to detect test results which are not written exactly as in the training set of texts. The other two features were counts for “risque” (risk) and “haut risque” (high risk). Of the top features, 83% achieved a higher chi-squared value if words with similar meanings were grouped. Higher percentages were obtained using information gain as another measure of feature relevance.

Discussion/conclusion This work showed that lexicographic similarities between sentences are the most relevant features for automatic detection of HPV test results in written medical reports. Using such features in text mining tools bears potential for better data processing in cancer registries.

A4.2

EPIDEMIOLOGIC TRANSITION OF CANCER IN KERALA, SOUTH INDIA

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Background Aleyamma Mathew, Preethi Sara George, Kalavathy MC, Padmakumari G, Jagathnath Krishna KM, Paul Sebastian. Cancer is emerging as a public health problem in Kerala. Cancer registry, Trivandrum district (3.3 million population) operates in the Regional Cancer Centre, Trivandrum under the network of Indian National Cancer Registry Programme since 2012.

Methods Cancer incidence and mortality are generated after collecting data on patients by visiting nearly 75 hospitals, pathology laboratories and vital statistics offices in the area. Address linkage of data obtained from pathology laboratories were made. Duplicate registrations were eliminated and care was taken to see that multiple entries of the same patient were not made.

Results Trivandrum has the highest crude cancer incidence rate (CR) in south India (n= 27,530 during 2012-16). Total CRs increased from 150 in 2012 to 181 in 2016 (ASR: 125.3 in 2012 and 142.1 in 2016) in per 100,000 males and from 144 in 2012 to 182 in 2016 (ASR: 114.3 in 2012 and 137.1 in 2016) in females. Based on the Trivandrum data, estimated about 66,500 (31760 males and 34685 females) new cancers in Kerala (35.7 million population) in 2016 and 96,960 in 2026. Common cancers in males were lung (ASR:17.2), oral cavity (ASR:16.1), colo-rectum (ASR:12.0), prostate (ASR:9.1) and in females, breast (ASR:41.4), thyroid (ASR:17.2), ovary (ASR:8.1), cervix-uteri (ASR:7.6), and colo-rectum (ASR:7.2) in 2016. Nationally, the highest CRs for breast, prostate, colo-rectum, corpus-uteri and bladder cancers were observed in Trivandrum. More than 60% of the cancers such as breast, oral cavity, colo-rectum present in advanced stages.

Conclusion Burden of cancer in Kerala is high. An epidemiologic transition in the cancer pattern is taking place and is changing to more similar to “western” jurisdictions. It is essential to set up a state-wide registry in Kerala in understanding the pattern of cancer in the other districts in Kerala and to generate hypothesis in the aetiology of various cancers.

A4.3

TUMOUR CHARACTERISTICS AND PROGNOSIS IN WOMEN WITH PREGNANCY-ASSOCIATED BREAST CANCER (PABC) IN SWEDEN

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Background There is evidence of poor prognosis in women with pregnancy-associated breast cancer (PABC) diagnosed during pregnancy or within 2 years of delivery. We examined clinicopathologic features (TNM stage, grade, hormone receptor status) and mortality in women with a current or recent pregnancy at breast cancer diagnosis.

Methods We followed a cohort of women identified in the Swedish Cancer Register with a diagnosis of invasive breast cancer (BC) between 1992 and 2009 at ages 15 to 44 years (n=9,441). Information on tumour characteristics was retrieved from 6 regional Breast Cancer Quality Registers (BCQR) and available for 95% of the women (n=9,006). Dates of childbirths were obtained from the Swedish Multi-Generation Register. Age-standardized distributions of tumor stage (TNM), Elston grade and ER/PR/HER2 status were compared between nulliparous women and women with breast cancer during pregnancy and up to 10 years post-delivery. Adjusted hazard ratios (HR) for mortality were estimated using Cox regression.

Results We identified 1,661 nulliparous women with BC, 778 women with PABC, and 3598 with BC during 2-10 years post-delivery. Compared to age-standardized nulliparous women, women with PABC had more advanced T and N stage, and higher proportions of ER/PR negative, HER2 positive and triple-negative tumors, in particular in women diagnosed 0-12 months post-delivery. A poorer survival was observed in women diagnosed within 5 years of delivery after adjustment for age, year, education and region. Following adjustment for tumor characteristics, hazard ratios were attenuated and non-significant, with the exception of women diagnosed 2-5 years post-delivery which remained significant.

Conclusion The poorer prognosis observed in women with pregnancy-associated breast cancer appears to be largely explained by more adverse tumor characteristics at diagnosis.

A4.4

LOGISTICS AND INFRASTRUCTURE OF A NATIONAL, PROSPECTIVE COLLECTION OF PATIENT REPORTED OUTCOME MEASURES (PROMS)

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Background In Norway, approximately 5 000 men are diagnosed with prostate cancer (PCa) each year. There is need for more knowledge about the health related and overall quality of life among PCa patients. This presentation will provide preliminary information on the feasibility and infrastructure of a nationwide, prospective controlled survey regarding patient reported outcome measures (PROMs) among recently diagnosed PCa patients. Although this study collects PROMs from PCa patients, the infrastructure can be modified for regular collection of PROMs for other cancer types.

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 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.

A4.5

PATIENTS' EXPERIENCES WITH DECISIONS ON TIMING OF CHEMOTHERAPY FOR BREAST CANCER

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Introduction Chemotherapy for early breast cancer is administered prior to or after breast surgery in neo-adjuvant (NAC) or adjuvant (AC) setting. Application of NAC is still infrequent and varies considerably between hospitals. This study investigated patients' experiences and preferences in receiving information on chemotherapy-timing during treatment for early breast cancer.

Methods A 35-item online questionnaire was distributed among female patients, age < 18, diagnosed in 2013-2014 in 19 Dutch hospitals with clinical stage II/III invasive breast cancer, who were all surgically treated and had been treated with either NAC or AC, selected from the Netherlands Cancer Registry (NCR). Outcome measures were: experienced information exchange, and patients' involvement in the decision-making process. Besides, patients' experiences and satisfaction with care were measured using the Cancer Therapy Satisfaction Questionnaire (CTSQ). Survey data were merged with NCR data, including all items for the NABON Breast Cancer Audit.

Results Of 805 invited patients 49% responded (179 NAC, 215 AC). NAC-treated patients were younger; more often treated in a teaching/academic and high-volume hospital; had different tumour characteristics (more often node-positive, higher stage, more often multifocal); more often received breast conserving surgery in case of stage II (all $p < 0.05$). All NAC-treated patients (100%) were informed about NAC compared to AC-treated patients (stage II: 14%, stage III: 31%). Provided information on chemotherapy in general was rated sufficient (stage II: 85% NAC, 63% AC; stage III: 73% NAC, 75% AC). Respondents not always felt they had a choice in the timing of chemotherapy as being either NAC or AC (stage II: 54% NAC vs 36% AC; stage III: 36% NAC, 50% AC).

Discussion(conclusion) Although patients rated the information they actually received on chemotherapy as sufficient, not all patients felt they decided together with their clinician on chemotherapy-timing. Lack of information on the possibility of NAC was revealed among most AC-treated patients.

A4.6

DIRECT AND INDIRECT DETERMINANTS OF INEQUALITY IN COLON CANCER SURVIVAL

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Background The aim of this study was to use structural equation modelling of survival to separate the direct and indirect effects of patient, sociodemographic, tumour and health service risk factors on inequalities in colon cancer survival.

Methods All cases of colon carcinoma registered in Ireland in 2004-2008 (n=5178) were included in a survival model based on structural equation modelling principles. This allowed modelling of the direct effects of each variable on survival, and also of indirect effects mediated through one, two or three other variables. The variables in the model were age, sex, marital status, deprivation score, urban/rural residence, public/private status, comorbidity, initial admission type, cancer stage and grade at diagnosis, appropriateness of treatment and hospital caseload.

Results Younger age, low-grade cancer, private patient status, rural residence and lower co-morbidity significantly reduced hazard through a direct effect. Four process-of-care variables—late stage, emergency admission, treatment in a low caseload hospital and less appropriate treatment—significantly increased hazard. Significant indirect effects included a reduction in hazard for private patients through earlier presentation and fewer emergency admissions; for married patients through more appropriate treatment; and for more affluent patients through admission to high caseload hospitals. Indirect effects which increased hazard included later stage presentation by married patients and less appropriate treatment for more affluent patients, the latter mediated by earlier stage at presentation.

Discussion The methodology has helped us to clarify the complex interrelationships among patient, socio-demographic, tumour and health service-related risk factors in affecting cancer outcomes. These interactions, sometimes reciprocal and sometimes opposing, are more easily elucidated and quantified using structural equation modelling than by conventional survival modelling. We advocate the wider use of these complex models to aid better understanding of the complexities involved and to support the development of more effective interventions to reduce survival inequalities.

B4.1

MAKING THE CASE FOR PARTNERSHIPS THAT BUILD CAPACITY THROUGH CANCER REGISTRY AND ANALYTICAL TOOLS

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Background One challenge faced by cancer registries, especially in low- and middle-income countries, is the lack of technical expertise and statistical software tools. Engaging participants responsible for developing open source/free applications and expert users is needed for implementation and dissemination in an era of limited external funding.

Methods As part of the Global Initiative for Cancer Registry Development (GICR), IARC, NCI, NAACCR, CARPHA, CDC, and PAHO collaborated to deliver certified training to 10 Caribbean registry participants, assisted with database conversions to CanReg5, and produced in-depth multi-year quality control statistical analyses. We took advantage of two widely-used tools and made some technical improvements to facilitate data export features in IARC's CanReg5 for input into NCI's SEER*Stat. This development required defining a simplified version of the NCI SEER*Prep extension Database Description or .dd file. SEER*Prep software is an intermediary step which converts text data into SEER*Stat's binary format and creates a SEER*Stat data dictionary.

Results Some analytical features are common to both registry software programs (e.g., frequencies, age-specific rates, age-adjusted rates), but statistics such as survival, prevalence, and multi-year analyzes, including annual percent change, require export of the data to other software. Using CanReg5 data from the Azores Cancer Registry and a Caribbean registry, we utilized the improved CanReg5 export function to create a SEER*Stat database and generate these additional statistics. A step-by-step process guide was outlined.

Discussion/conclusion Partnerships and collaborative projects within the IARC/GICR Caribbean Hub help build capacity, facilitate knowledge transfer, and integrate unique features of popular cancer registry software systems. Such support is critical for cancer registries with limited staff and technical expertise. More comprehensive data analyses are necessary to improve registry management and statistical reporting. Improving data transfer between a registry data collection system (e.g., CanReg5) and registry specific analysis software (e.g., SEER*Stat) helps meet international needs.

B4.2

IMPORTANCE OF HOSPITAL CANCER REGISTRIES (HCR) IN GENERATING EVIDENCE BASE FOR CLINICAL CARE

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Background HCR at Cancer Institute (WIA), a tertiary cancer care centre in South India, has a goal of lifetime follow-up of treated cancers with an emphasis on high resolution data.

Methods Active follow-up methods are integrated in regular registry practice. Survival outcome on 3,865 breast, 3,049, cervix and 3556 head and neck cancer cases treated during 2006-12 and followed till 2016 were analysed. The disease-free (DFS) and overall (OS) survival were estimated using actuarial method. Trend of OS during 1990-2012 was studied.

Results The median age at diagnosis for cancers of breast, cervix and head and neck were 49, 50 and 55 respectively with 71.6%, 89% and 99% of respective patients started on treatment within one month of registration. Losses to follow-up was less than 5% at 5 years in all these sites. The DFS, OS and cumulative risk of second cancers at 5 years from diagnosis were 60.2%, 68.3%, 1.94% for breast cancer, 62.1%, 65.6%, 1% for cervix cancer and 38.2%, 43.5% and 2.2% for head and neck cancers respectively. Decreased survival was observed with increasing stages. Between 1990-99 and 2006-12, down-staging was achieved in cervix cancer (Stage II:46% vs 61%) but not in breast (Stage III:41% vs 47%) and head and neck cancers (Stage IV:44% vs 47%). An increased OS with increasing calendar time was observed in cervix and breast cancers commensurate to evolving treatment milestones. OS for head and neck cancers remained static predominantly due to continued presentation in stage 4 over time. OS by socio-economic status narrowed down over time indicating equity in access to care.

Conclusion Routine survival outcome backed by good documentation and long-term follow up had generated evidence base for evolving treatment protocols to provide improved care to cancer patients.

B4.3

METFORMIN USE AND GASTRIC ADENOCARCINOMA SURVIVAL IN BELGIUM

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Background In Belgium, gastric cancer has a low incidence (~5/100,000 person-years) but a poor survival (~40% at 5 years). In this cancer, an antitumoral effect of metformin, a well-known and frequently used oral antidiabetic drug, has been shown in several preclinical studies and in one clinical South-Korean series. We aimed to assess the impact of metformin use on gastric adenocarcinoma survival in a population-based cohort of diabetics.

Methods All patients diagnosed with stage I to III gastric adenocarcinoma in Belgium between 2006 and 2012 were selected from the Belgian Cancer Registry database. Cancer treatments and diabetic status were retrieved from health insurance databases. Vital status was retrieved from the Crossroads bank of Social Security and causes of death from the three Belgian Regions. Overall (OS) and cancer-specific (CSS) survival were assessed using a Cox regression model with metformin use as a time-varying covariate (TVC), adjusting for potential confounders and for competing risks of death.

Results Out of 2,552 selected patients, 371 (15%) were diabetics, for whom the median survival time was 34 months in metformin users (n=271), and 15 months in non-users (n=100). In TVC analysis, metformin use appeared beneficial in terms of OS (adjusted HR=0.66, p<0.01) but was not significant in CSS (adjusted HR=0.72, p=0.07). In competing risk analysis results remained similar. Subgroup analyses indicated a significant benefit of metformin in stage I patients both for OS and CSS (OS: adjusted HR=0.43, p=0.002 and CSS: adjusted HR=0.27, p=0.005). Positive effects of metformin were also seen in cisplatin users (OS: adjusted HR=0.31, p<0.001 and CSS: adjusted HR=0.35, p<0.001).

Conclusion In alignment with previous studies, our findings suggest that metformin might decrease mortality in diabetic gastric cancer patients when diagnosed at an early stage or in association with cisplatin.

B4.4

CHALLENGES WITH CAPTURE-RECAPTURE AT THE IBADAN CANCER REGISTRY, NIGERIA

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Background Cancer registries provide valuable data for retrospective studies in oncology. However, discrepancies between such data and hospital records may pose challenges towards reliable data acquisition for effective and reliable statistical analysis. We sought to determine the feasibility and reliability of using data on cancer patients from cancer registry to obtain clinical and survival information over a five-year period (2016-2010) and to document the problems associated with using such data in assessing patients' outcome.

Methods Data from the Ibadan Cancer registry was obtained on patients diagnosed with prostate cancer from 2016 – 2010. The records of the Cancer Registry included hospital numbers, age of patients, histology number, and characteristics of tumour histology. Hospital numbers were used to retrieve the case records from the records department of the hospital. Sociodemographic, clinical and disease characteristics were extracted from the hospital records. Problems encountered in retrieving the information were noted. Efforts were made to resolve discordant information between Cancer Registry and Hospital records.

Results A total of 516 cases were extracted from records of the Cancer Registry. Hospital numbers were unavailable for 30 entries. Only 324 case notes (66.67%) were retrievable from the Health Records Department. On review, 245 (75.6%) case notes had cancer prostate diagnosis documented while 79 cases were captured as benign. Of these 79 cases, the histology slides of 51 were available and reviewed with malignant diagnosis rendered. It turned out the case notes seen were temporary only and not all information about the patients were obtainable from the health records department. Additionally, the histology slides of 28 cases could not be retrieved.

Conclusion Hospital records may not necessarily indicate the diagnosis of cancer for some cases captured in the Cancer Registry. Additional efforts may be necessary to ensure proper capturing of cancer diagnosis by the medical records department.

B4.5

CANCER AS A RISING HEALTH PROBLEM IN YEMEN: THE EXPERIENCE OF ADEN CANCER REGISTRY

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Background Cancer is a major killer throughout human history and appears to change its grasp as human kind advanced industrially and technologically. In Yemen, there is evidence of rising trend of cancer incidence. This paper aimed at describing the pattern of cancer since the inception of registration in Aden Cancer Registry in 1997 with particular focus on the period 2007-2011.

Methods Data from Aden Cancer Registry, a population-based cancer registry covers around three million inhabitants in four governorates (Aden, Lahj, Abyan and Al-Dhalea) were collected. These include cancers from main hospitals, public and private clinics, diagnostic centers, and abroad treatment registry at the Office of Public Health and Population. Canreg-4 was used for data entry and analysis. The World Standard Population and the local covered population were used in the calculation process.

Results During 2007-2011, a total number of 3500 cancer cases were reported with an increment of 98% from the first five-year incidence report (1997-2001) and 73% from the second one (2002-2006). Fifty four percent of patients were females. The mean age in male patients was 49.5 ± 3.5 years and in females 48.6 ± 2.5 years. In order, the most leading sites were the digestive system (19.1%), followed by breast, lymphomas, head and neck, and leukemias (17.6%, 14.3%, 9.9% and 9.7% respectively). The age standardized rate per 100,000 inhabitants was 31.1 and 32.9 for males and females respectively.

Conclusion Females share a higher burden of cancer compared to males. The current report shows increased incidence of most cancers compared to previous ten years. The need to investigate cancer-related community risk factors is highly recommended.

B4.6

CANCER PREVALENCE IN ZHONGSHAN OF CANTON, 1970-2013

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Background Real prevalence data has never been systematically studied in China, especially for long term data. Hence, we thoroughly explored its long term prevalence data in Zhongshan of China in 1970-2013.

Methods Prevalent data of cancer patients, who were diagnosed in Zhongshan in 1970-2013 and still alive on 31, December 2013, which came from population-based Zhongshan Cancer Registry, were collected and collated. Such indices as its prevalent counts, proportions, and the ratio of prevalence with incidence, stratified by time, age, sex, and sites, were calculated and analyzed.

Results As of 31, Dec, 2013, there were 10 527 alive cancer patients diagnosed in previous 5 years in Zhongshan, its 5 years prevalent proportion was 689.59/105. Top 5 male prevalent cancers were nasopharynx, colorectum, lung, liver, and prostate cancer, respectively, and breast, uterus, colorectum, lung, and thyroid cancers for female, respectively. Nasopharyngeal cancer was the top 1 and 7 prevalent cancer for male and female, respectively. Generally, the female prevalence in Zhongshan was higher than the male, the prevalence diagnosed in previous 2-3 years were higher than diagnosed in previous 1 and 4-5 years. Prevalence before age 35-39 was low and increased quickly after age 40. Cancer prevalence varied by different sites, sex, and age. Moreover, its prevalence in 2000-2013 increased obviously in Zhongshan.

Conclusion 5 years cancer prevalent proportions in Zhongshan on 31, December 2013 were at high-middle level worldwide and nationwide, while the prevalence of nasopharyngeal cancer at high level. Its prevalence in Zhongshan in 2000-2013 increased remarkably. It suggested that Medicare for alive cancer patients should be paid more attention, and medical resources in Zhongshan should be allocated properly accordingly.



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APC-1

THE LONG-TERM TRENDS OF CHILDHOOD CANCER INCIDENCE IN JAPAN BASED ON POPULATION-BASED CANCER REGISTRIES

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Background It is said that childhood cancer incidence is about 2,000-2,500 per year in Japan, there are not clearly reports. Investigating whether it is true or not and studying the actual condition according to base on population-based cancer registry is important.

Method This study analyzed population-based cancer registry data of patients diagnosed between 1974 and 2012. We chose multiple prefectures to use relatively high accuracy cancer registration. We consequently got permission for using population-based cancer registries of nine prefectures. Childhood cancer was defined as cancer under 15 years of age. Therefore, we excluded cancers that were classified as “benign”, “uncertain benign or malignant”, and “carcinoma in situ”; we used to only “malignant”. The childhood cancer incidence was calculated according to population-based cancer registry by year and was classified by using international classification of childhood cancer, third edition (ICCC-3). We computed the crude incidence rate, the age-adjusted incidence rate and confidence interval. Moreover, the nationwide childhood cancer incidence was estimated by using to the crude incidence rate and the national child population.

Result The nationwide childhood cancer incidence was indicated to be the maximum value between 1978 and 1988. Subsequently, child population gradually decreased and the incidence was estimated to be less than 2,000 per year. In addition, the crude incidence rate was calculated as average of 10.5 per 100,000 people. The age-adjusted incidence rate was almost stable (approximately 2 per 100,000 people), and average 2.16 per 100,000 people.

Conclusion Recently, the number of the patients with childhood cancer was decreasing; because of they would be significantly related to decrease of children population. The childhood cancer incidence rate was showed almost constant value regardless of fluctuation of the incidence and population.

APC-2

VALIDITY OF USING MULTIPLE IMPUTATION FOR “UNKNOWN” STAGE AT DIAGNOSIS IN POPULATION-BASED CANCER REGISTRY DATA

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Background Multiple imputation (MI) is a practical and convenient method for handling incomplete cancer stage data, but its validity for imputation of “unknown” cancer stage has not been assessed in real-world conditions. The aim of this study was to assess the validity of using MI for “unknown” prostate cancer stage recorded in the New South Wales Cancer Registry (NSWCR).

Methods The NSW Prostate Cancer Care and Outcomes Study (PCOS) is a population-based cohort study linked to 2000-2002 NSWCR data. For cases recorded in the NSWCR as “unknown” stage, PCOS-stage was extracted from clinical notes. Logistic regression was used to evaluate the missing at random (MAR) assumption adjusted for variables from two imputation models: a basic model including variables recorded in the NSWCR only and an enhanced model including the same NSWCR variables together with primary treatment as recorded by PCOS. Cox regression examining the associations between prostate cancer-specific survival and socio-demographic factors and stage at diagnosis was used to evaluate the performance of MI.

Results Of the 1864 cases in PCOS, 32.7% were recorded as “unknown” stage in the NSWCR. The MAR assumption was satisfied using the enhanced model, but not using the basic model, where cases with distant stage were more likely to be recorded as “unknown” in the NSWCR. In the multivariable Cox regression models, analysis of data with imputed stage from either imputation model provided generally consistent estimated hazard ratios but with wider confidence intervals compared with those derived from analysis of the data with PCOS-stage.

Conclusions Using MI to deal with “unknown” stage data recorded in a population-based cancer registry appears to provide valid estimates when the method has been correctly implemented. We would recommend a cautious approach to the use of this method elsewhere.

Analysing, presenting and communicating cancer registry data

APC-3

RECENT TRENDS IN BREAST CANCER INCIDENCE AND MORTALITY IN DAEJEON AND CHUNGNAM, SOUTH KOREA

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Background Breast cancer is the second most common cancer in South Korea. We described the trends in incidence and mortality of female breast cancer in Daejeon metropolitan city and Chungnam province (2000-2014), South Korea.

Methods Using the Daejeon Cancer Registry and the Chungnam Cancer Registry, age-standardized (to world standard population) rates for incidence (ASR_i) and mortality (ASR_m) were calculated in women. Annual percent change (APC) and average annual percent change (AAPC) were estimated using Joinpoint regression.

Results Incidence of breast cancer showed increasing trend in both regions. During the period 2000-2014, ASR_i was increased significantly from 26.4 to 50.5 per 100,000 (AAPC, 4.4%) in Daejeon and from 16.5 to 45.4 per 100,000 (AAPC, 7.3%) in Chungnam. However, breast cancer mortality rates had no significant changes in both regions (ASR_m 4.1 to 4.7 per 100,000 (AAPC 1.0%) in Daejeon; ASR_m 3.8 to 5.5 per 100,000 (AAPC 2.6%) in Chungnam).

Discussion/conclusion The incidence of breast cancer in both Daejeon and Chungnam provinces has steadily increased, but breast cancer mortality has no significant change. Monitoring and intervention on factors that may affect this trend are needed.

APC-4

ASSOCIATION BETWEEN INCOME AND INCIDENCE RATES AMONG CERVICAL CANCER PATIENTS IN AOMORI PREFECTURE, JAPAN

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Background Incidence rate of cervical cancer is increasing from the 2000s in Japan. Several studies have reported that high incidence of cervical cancer is related with low income because prevalence of HPV infection is high among individuals with low-income, but there are few researches showing the association. We examined the association between income level and incidence of cervical cancer in Aomori prefecture, Japan.

Methods Population in 2010 to 2012 stratified by municipalities, sex and age group was obtained from National Census. Incidence cases of cervical cancer (ICD-O-3; site code: C53) in 2010 to 2012 were extracted from Aomori cancer registry data base. Address of patients, age and stage at diagnosis were also extracted. Age standardized incidence rates (ASRs) of them were calculated by direct method using Japanese standard population. Age at diagnosis was classified into three groups: <40 years, 40-59 years, and ≥60 years. Stage at diagnosis was classified into In Situ, Localized, Regional, Distant and Unknown. Municipalities of patients' resident were stratified into 4 groups by average income of them. Rate Ratios (RR) and 95% CIs of cervical cancer incidence were calculated when the lowest income area was the reference.

Results The ASRs and RRs increased with average incomes in all age groups. The ASRs and RRs increased with average incomes in the stage of In Situ, but the association was not determined in other stages.

Conclusion This study showed the relationship between high-income and high ASRs, especially in stage of in situ. Because attendance rate of cervical cancer screening were equal in all income area, overdiagnosis derived from easy access to hospitals would raise the incidence rate of the disease in the affluent area.





APC-5

SURVIVAL POPULATION OF CERVICAL CANCER IN THE PERIOD 2000 TO 2009, GRANDE CUIABÁ/MT- BRAZIL

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Background Cervical cancer is a public health problem because of its magnitude and well-being in developing countries. It is a disease with slow development and with the possibility of early diagnosis and appropriate treatment can reduce mortality, incidence and increase survival. Objective: Estimate the overall survival of cervical cancer diagnosed in Greater Cuiaba from 2000 to 2009.

Methods A survival analysis of cervical cancer cases in Greater Cuiabá, Mato Grosso, diagnosed in the years 2000 to 2009, was carried out based on information from the Population-Based Cancer Registry (PBCR). The overall survival of cervical cancer was calculated using the Kaplan-Meier method, comparing the curves with the log-rank test respectively and calculating the COX proportional risk.

Results Overall survival in the first year was 82.3% (95% CI: 24.9-39.3) in over 5 years and 61.5% (95% CI: 24.9-39.3) in over 10 years. In the log-rank test there was statistically significant differences between the age groups between 30 and 39 years and = 60 years ($p < 0.001$), 40-49 years and 50-59 years ($p = 0.049$) and = 60 years ($p < 0.001$), 50-59 years and = 60 years ($p < 0.012$). In the adjustment of Cox proportional hazards there was an increased risk of death for the age category = 60 years (1.87 RR, 95% CI: 1.42, 2.46) and in the other neoplasms group (2.14 RR, 95% CI: 1.30, 3.51).

Conclusion Overall survival in Greater Cuiabá was similar to the relative survival found in both international and Brazilian studies and lower than that observed in developed countries. The cases in the age group = 60 years and the group of other neoplasms presented the lower survival. Therefore, information from population based cancer registries is essential for evaluation, monitoring, strategic planning and formulation of effective policies for the control and detection of cervical cancer.

APC-6

ANALYSIS OF THE INCIDENCE TREND AND MORTALITY BY CERVICAL CANCER IN THE GREATER CUIABÁ /MT- BRAZIL.

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Background Cervical cancer is a public health problem because of its magnitude and frequency in developing countries. Objective: To analyze the incidence trend 2000-2009 and the mortality of 1981-2014 cervical cancer patients in Greater Cuiabá –MT.

Methods This is an ecological study of chronological series, using Mortality Information System (SIM) data, which included deaths from cervical cancer and those with mention of this neoplasm for proportional redistribution, by year of occurrence and age group. New cases of invasive and in situ cervical cancer were included, provided by the Population Base Cancer Registry (RCBP) of Greater Cuiabá. The population denominators were accessed on the DATASUS website. Specific rates were calculated age-adjusted (TxA) rates for incidence and mortality. The trend was analyzed through Joinpoint Regression.

Results In general, the TxA for mortality and incidence were very high, comparatively to those observed in developed countries. The mortality trend for TxA, presented a slight significant decline with APC of -1.0%. By age, the reduction trend was only significant in the age range of 60 - 69 years with APC of -3.9%. The incidence of carcinoma in situ showed a tendency to stability. In the age groups, presented a statistically significant increase in the range of <30 years APC of 21.1%. The invading CCU showed a trend of reduction with in the TxA APC of -8.4% and a statistically significant reduction in the age groups 30 - 39, -7.9%, 40 - 49 10.5%, 50 - 59, APC of -7.9% and 60-69, APC -10.5%.

Conclusion There was a reduction in the incidence trend of the TxAs for the invading CCU and mortality. In situ carcinoma showed a tendency for stability. However, rates observed were very high for invasive CCU and for mortality, reflecting failures in access to early detection and appropriate and timely treatment.

Analysing, presenting and communicating cancer registry data

APC-7

CANCER OF UNKNOWN PRIMARY - TRENDS IN INCIDENCE AND SURVIVAL IN THE CANTON OF ZURICH, SWITZERLAND

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Background Cancer of unknown primary (CUP) represents a heterogeneous group of metastatic cancers with unknown primary site. Due to cancer heterogeneity and limited efficacy of conventional chemotherapy, CUP patients could be ideal candidates for molecularly guided targeted therapies. Therefore, we examined incidence and survival trends from 1981 to 2014 of CUP patients in the Swiss canton of Zurich.

Methods We identified 2946 CUP patients. Age-standardized incidence rates (ASR) per 100,000 were calculated. Histological groups were separated into adenocarcinoma, squamous cell carcinoma, unspecified carcinomas, and other specific types of cancers and carcinomas. Kaplan-Meier survival curves were estimated for sex, age and histological groups. Cox proportional hazards regression models were used to estimate hazard ratios.

Results ASR increased between 1981 and 1997 from 10.5 to 17.6 and then decreased to 5.9 / 100,000 in 2014. Mean overall survival was as 11.5 (standard deviation 32.1, median=2.3) months. Despite a reduction of ASR, the overall survival has not improved over the last 34 years. Mean age of CUP patients increased from 70 years 1981 to 79 years in 2014. After adjustment for sex, age and histological groups, the risk of dying was significantly lower for squamous cell carcinomas (HR 0.48 [95% CI 0.40 – 0.57]) and other specific types of cancers (0.78 [0.68 – 0.89]) compared to the adenocarcinoma, while for unspecified carcinomas no differences were observed. Women were less likely to die compared to men (0.86 [0.80 – 0.93]).

Conclusions/Discussion Despite a decline of ASR in the Canton of Zurich, overall survival of CUP patients is still poor. This might be explained by the increased age of CUP patients at recent time periods and limited treatment options. Our data demonstrate that there is a medical need to introduce molecular profiling for CUP patients allowing them to potentially benefit from novel targeted therapies.

APC-8

TRENDS IN CANCER INCIDENCE RATE AMONG THE ELDERLY PEOPLE IN JAPAN BASED ON POPULATION-BASED CANCER REGISTRIES

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Background The number of patients who are diagnosed with cancer at age 80 and older has also increased. On the other hand, the Japanese age category of national demographic statistics is 18 classes, by 5 years old for from 0 to 84 years old, and added together for over 85. Therefore, in order to comprehend the actual incident condition for the elderly people in detail, it is necessary to examine original data classification of population-based cancer registries.

Methods This study was investigated on the 2,642,521 reported cases of patients who were diagnosed as having primary cancer between 1975 and 2010, who were enrolled for the population-based cancer registries of seven prefectures, those satisfied the international cancer registry standard among cancer registries in Japan. We calculated cancer incidence, age-specific incidence, crude incidence rate, age-adjusted incidence rate, standardized incidence rate, confidence intervals and annual change for each prefecture and major site by the re-aggregated age categories. The re-aggregated age group was calculated in 20 categories with additions of categories of 85 years old to 89, 90 to 94, and over 95.

Results For instance, in the age-adjusted stomach cancer incidence rate, there was a moderate declining trend in each segment between 65 and 89 years of age and the 90 years old to 94 trend showed an upward trend until around 1997, after which it was on a downward trend. The age-adjusted incidence rate of 90 years old up to 94 was not so high in 1975 to 1980, but after 1990 it was higher than other age classes. The three newly set up age classes showed unstable fluctuations at first, however, showed rather stable trend from around the year 2000 onwards in the almost cancer sites.

Conclusion The importance of consideration for the possible and effective age classification was suggested.





APC-9

CHOLANGIOCARCINOMA TRENDS INCIDENCE AND RELATIVE SURVIVAL IN KHON KAEN, THAILAND, 1989-2013: A POPULATION-BASED CANCER REGISTRY STUDY

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Background The population-based Khon Kaen Cancer Registry (KKCR) was established in 1984 at the Faculty of Medicine, Khon Kaen University. Liver cancer, especially cholangiocarcinoma (CCA) is the most frequent malignancy among northeastern Thai people. During the last four decades there were many policies for prevention of cholangiocarcinoma, but there has since been no update of trends over time and especially, relative survival. Objective: To perform a statistical assessment of the incidence trends between 1989 and 2013, and relative survival of CCA.

Methods All cases of CCA (ICD-O-3rd; C22.1, C24.0, C24.8, and C24.9 (excluding C24.1, Ampulla of Vater) diagnosed between 1989 and 2013 were abstracted from KKCR. A joint point regression model was used to estimate annual percentage change (APC) with a 95% confidence interval (95%CI). To analyze relative survival (RS), we calculated survival time from diagnosis to patients last known vital status. Patients had follow-up available until December 31, 2016.

Results There were 11,711 cases of CCA from 1989-2013. Overall, the male to female ratio were 2.2:1. The mean age was 62.6 years (sd. =11.2 years). The age standardized rate (ASR) per 100 000 was 41.5 for males (95% CI: 40.6 to 42.4) and 16.6 for females (95% CI: 16.1 to 17.1). The annual percent change (APC) in incidence rates between 1989 & 2002 (APC1) and 2002 & 2013 (APC2) among males significantly increased by 1.7% per year (APC1: +1.7%, 95% CI: -0.3% to 3.7%), and decreased by 6.2% per year (APC2 = -6.2%, 95% CI: -8.4% to -4.0%) respectively. In females the APC between 1989 & 2002 and 2002 & 2013 increased by 2.2 % per year (APC1: +2.2%, 95% CI: -0.2% to 4.6%), decreased by 5.7% per year (APC2 = -5.7%, 95% CI: -8.1% to -3.2%) respectively. Five-years RS for both sexes, focusing on age groups 30-40 yrs., 41-45 yrs., 51-60 yrs., and more than 60 yrs. were 22.3% (95% CI: 16.8 to 29.5), 14.3% (95% CI: 12.0 to 17.0), 8.6% (95% CI: 7.8 to 10.0) and 7.2% (95% CI: 6.4 to 8.0), respectively.

Conclusions Our findings show that the incidence rates of CCA decrease in the most recent 10 to 12 years with poor five-year survival in all age groups.

APC-10

QUALITATIVE IMPROVEMENT METHODS THROUGH ANALYSIS OF INQUIRY CONTENTS FOR CANCER REGISTRATION

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Background In Korea, the national cancer database was constructed after the initiation of the national cancer registration project in 1980, and the annual national cancer registration report has been published every year since 2005. Consequently, data management must begin even at the stage of data collection in order to ensure quality. Objectives: To determine the suitability of cancer registries' inquiry tools through the inquiry analysis of the Korea Central Cancer Registry (KCCR), and identify the needs to improve the quality of cancer registration.

Methods Results of 721 inquiries to the KCCR from 2000 to 2014 were analyzed by inquiry year, question type, and medical institution characteristics. Using Stata version 14.1, descriptive analysis was performed to identify general participant characteristics, and chi-square analysis was applied to investigate significant differences in distribution characteristics by factors affecting the quality of cancer registration data.

Results The number of inquiries increased in 2005-2009. During this period, there were various changes, including the addition of cancer registration items such as brain tumors and guideline updates. Of the inquirers, 65.3% worked at hospitals in metropolitan cities and 60.89% of hospitals had 601-1000 beds. Tertiary hospitals had the highest number of inquiries (64.91%), and the highest number of questions by type were 353 (48.96%) for histological codes, 92 (12.76%) for primary sites, and 76 (10.54%) for reportable.

Conclusions A cancer registration inquiry system is an effective method when not confident about codes during cancer registration, or when confronting cancer cases in which previous clinical knowledge or information on the cancer registration guidelines are insufficient.

Analysing, presenting and communicating cancer registry data

APC-11

DATA RESOURCE PROFILE: THE SURVEY OF THYROID CANCER IN KOREA (NEST)

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Background The Korea Central Cancer Registry (KCCR) has covered all cases of cancer incidence from 1999 to 2013. Using the national cancer database, the KCCR conducted the National Epidemiology Study for Thyroid cancer (NEST) study to investigate the changes in the epidemiological and clinical characteristics of thyroid cancer patients between 1999 and 2008.

Methods The NEST study was designed to collect representative samples of thyroid cancer patients diagnosed in the years 1999, 2005, and 2008 using a proportionally stratified and systematic random sampling method. Among 42,891 subjects who were diagnosed with thyroid cancer, total 5,796 participants were included in the final study population. This survey collected information on diagnostic methods and date, pathway of diagnosis, past history and thyroid related disease, TNM and collaborative stage and treatments. The NEST study data were also linked to the cause of death data of National Statistics office in Korea.

Results The mean age for study participants was 46.9 years old. The ratio of men to women was 1:4.8. According to the histologic type of cancer, the proportion of papillary thyroid carcinoma shows an increasing trend ($p < 0.01$). On the other hands, the proportion of distant metastasis and mean tumor size showed decreasing trends with increasing year, respectively ($p < 0.01$, $p < 0.01$).

Conclusion The Korean Central Cancer Registry developed web site for the NEST survey data in 2014 year (Available from: <http://kccrsurvey.cancer.go.kr/index.do>). The NEST data is freely available on the request.

APC-12

CANCER REGISTRY DATA AS A MEANS OF COMMUNICATING WITH PATIENTS -J-CIP PROJECT-

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Background The Japanese Association of Cancer Registries (JACR) started on the Japan Cancer Information Partnership (J-CIP) as a new initiative to reprocess and show the pooled population-based cancer registry data from the viewpoints of patients and patients' family.

Methods The J-CIP project team, consisting of researchers, administrative officers, cancer registry staff, health care professionals, and private companies, works to support patients and their families by achieving the three missions: 1)J-CIP Local, 2)J-CIP Global, and 3)J-CIP Empower. The first mission, J-CIP Local reorganizes local cancer information together with administrative officers and patients. The second mission, J-CIP Global compare the high-quality cancer registry data with the international standard study outcomes to enlarge cancer patients' perspective of the current cancer statistics in Japan. The last mission, J-CIP Empower facilitates meetings to improve the information literacy on cancer registry data of cancer patients, administrative officers and medical professionals.

Results The team signed a pact with the Japan Federation of Cancer Patient Groups (JFCPG) for co-sponsorship in June 2017. As the first activity of the J-CIP Local, the team plotted site-specific cancer incidence of the 10 medical care areas in Gunma prefecture (population of 1.99 million) on a map. The map revealed the intra-prefectural disparity of cancer burden.

Discussion/conclusion J-CIP project was launched as a new JACR project. JACR will be committed to expand areas to bridge the gap between the published cancer registry data by the health ministry and the national cancer center and cancer patients.





APC-13

CHARACTERISTICS AND TIME TREND OF MALIGNANT BONE TUMORS DIAGNOSED FROM 1957 TO 2012 IN HIROSHIMA CITY, JAPAN

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Background Primary malignant bone tumors (MBTs) are rare and have not shown a longitudinal time trend of incidence in Japan.

Methods Subjects were patients who were diagnosed with MBT (ICD-O-3 topography: C40–C41) and registered in the Hiroshima City Cancer Registry from 1957 to 2012. Cases were examined by sex, histological type, and skeletal site of tumor occurrence. The time trends of age standardized incidence rates (ASRs per million by 5 year-intervals) were evaluated using Joinpoint regression analysis.

Results We observed 314 primary MBT cases, comprised of 194 cases in males (ASR=7.4) and 120 cases in females (ASR=4.6) over 56 years of follow-up. The number of MBTs peaked in teens aged 10-19 years for both sexes (n=80, 25.5%), and distributed primarily in long bones of lower limbs (n=120, 38.2%) and in pelvic bones (n=55, 17.5%). Osteosarcoma was the most frequent MBT (n=136, 43.4%) and peaked in teens (n=61, 44.9%), occurring primarily in long bones of lower limbs (n=74, 54.4%). Chondrosarcoma was second dominant (n=59, 18.7%) and occurred in long bones of lower limbs (37.2%), in ribs (22.0%) and in pelvic bones (22.0%), with peak in those aged 20–29 years (17.0%) and 40–49 years (20.4%). Overall, ASR of MBT in males in 1957–64 was 23.1, then showed a decreasing trend until 1970 with an annual percent change (APC) of -10.5% (95%CI: -20.7; 0.9, P=0.1), then plateaued thereafter (APC=0.7%, 95%CI: -1.6; 3.1, P=0.5). ASRs of MBT in females were stable for the entire study period (APC=0.2%, 95%CI: -0.8; 1.3, P=0.5).

Conclusion Although a high incidence rate of MBT in males was observed before 1970, incidence rates did not change substantially for both sexes over the past four decades.

APC-14

LUNG CANCER TRENDS BY HISTOLOGICAL TYPE IN ESTONIA, 1985-2014

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Background The study aimed to examine trends in lung cancer (LC) incidence by histological type in Estonia during and after social, economic and health care transitions that took place in the 30-year period.

Methods Data on cases of LC (ICD-10 C33-C34) diagnosed in 1985-2014 were obtained from the population-based Estonian Cancer Registry. Age-standardized incidence rates by gender were calculated for four major histological groups. Joinpoint regression was used to analyze time trends and estimate annual percentage change of rates (APC). Only statistically significant APCs are shown.

Results The proportion of microscopically verified cases increased and the proportion of cases with unspecified morphology decreased significantly over time. Overall LC incidence peaked among men in 1991 and turned to decrease thereafter (APC: -1.5%), while the incidence among women increased continuously over the entire study period (APC: 1.6%). Age-standardized incidence rate (world) per 100,000 was 54.2 in men and 12.9 in women in 2014. In men, trends in the incidence of squamous cell carcinoma (SQC) and small cell carcinoma (SMC) followed the overall incidence trend; the incidence of large cell carcinoma (LCC) increased over the study period (APC: 1.9%). In women, the incidence of SQC and LCC increased (APC: 2.4% and 3.8%, respectively), but the incidence of SMC remained stable. The incidence of adenocarcinoma (ADC) increased among women over the entire study period (APC: 5.8%), whereas in men a steep rise was seen since 2000 (APC: 6.0%).

Conclusions The study revealed divergent trends by histological type which were generally consistent with international findings. The most pronounced changes occurred for ADC, which in men showed a trend opposite to the overall declining incidence. As the reasons for worldwide rise in the incidence of ADC remain unclear, studies are warranted to identify the risk factors behind this.

Analysing, presenting and communicating cancer registry data

APC-15

SPATIAL ANALYSIS OF SMALL AREA CANCER INCIDENCE USING GIS TOOL, GWANGJU-JEONNAM CANCER REGISTRY, KOREA

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Background Variations in the cancer incidence among the small geographical areas can give us the insights that will help the cancer surveillance and epidemiological investigation, especially for geographical factors. Spatial analysis using geographical information system (GIS) tool commonly used to evaluate the geographic variation of cancer incidence.

Methods Cancer incidence data, including stomach, colorectal, liver, lung, and breast cancer, are extracted from on the Gwangju Jeonnam Cancer Registry, South Korea, in the last 15 years (1999-2013). The reported incidences of the disease were standardized on the basis of the WHO standard population with the direct method. Exposure rate of risk factors, including smoking rate and drinking rates, among the total of 391 geographic areas were calculated using the database of the Community Health Survey of Korean Center for Disease Control and Prevention (2008-2015). Spatial analysis, including mapping, cluster outlier analysis, hot spot analysis, and geographically weighted regression, were performed using the ArcGIS packages.

Results Stomach cancer incidence was higher in inner areas and lower in seaside areas. Conversely, higher incidence of liver cancer was observed in seaside areas. No geographic correlation between incidence of lung cancer and smoking rate was found. However, incidence of liver cancer was highly correlated with the drinking rate in seaside areas.

APC-16

INCIDENCE OF HEPATOCELLULAR CARCINOMA IN CHILDREN AND ADOLESCENT IN KHON KAEN, THAILAND: AN UPDATE FOCUSING ON BEFORE AND AFTER NATIONAL HEPATITIS B VACCINE PROGRAM

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Background Hepatitis B vaccination is effectively against hepatitis B infection which is a risk factor for hepatocellular carcinoma (HCC). Vaccination against hepatitis B virus (HBV) was included in the Expanded Program on Immunization (EPI) in Thailand since 1990. Currently, there is no long-term evaluation of HCC in children and adolescent after the implementation of HBV vaccination. Objective: To evaluate the incidence of HCC before and after the introduction of HBV vaccination in children and adolescent.

Methods Cases of HCC (C22.0) in children under 20, diagnosed during 1985-2015, were retrieved from the data set of population-based cancer registry of Khon Kaen province. The age-standardized rate (ASR) was estimated and a joinpoint regression model was used to estimate the annual percentage change (APC). Incidence rate ratio (IRR) of HCC before and after EPI program was calculated.

Results There were 19 cases of HCC. Boys were predominant (ratio 3.8:1). Mean and median ages were 16.3 ± 2.4 years and 17 years (min=10, max=19), respectively. The percentage of morphology verification was 31.6%. Before HBV vaccination program (1985-1989), the ASRs (per million) were 1.13 (95% CI: 0.35 - 1.91) for boys and 0.42 (95% CI: -0.06 - 0.89) for girls while the ASRs after HBV vaccination program (1990-2015) were 0.80 (95% CI: 0.21 - 1.39) for boys and 0.12 (95% CI: -0.11 - 0.35) for girls. The APC in incidence rate (1985-2015) decreased by 0.84% per year (APC: -0.84%, 95% CI: -3.7-2.1%) for both sexes. Focusing on HBV vaccination, ASRs for children who were vaccinated was 0.47 (95%CI: 0.14-0.79) while for those who were non-vaccinated was 0.77 (95%CI: 0.31-1.23). Additional vaccination decreased the risk of developing HCC by 27.0% (IRR = 0.83; 95% CI: 0.40-1.76, P=0.631).

Conclusions The incidence of HCC in Thai children and adolescent decreased after expanded national HBV vaccination program in EPI statistically not significant. Longer period of follow up is needed.





APC-17

GALL BLADDER CANCER: 20 YEARS PROFILE OF A TERTIARY CANCER CENTER

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Background Gallbladder Cancer (GBC) is highly lethal and the commonest biliary malignancy showing geographical and racial variations. It is twice more common in women than in men and is the commonest digestive cancer in women in northern India. The present study was conducted with an aim to determine the incidence, age, stage, morphology & gender distribution of GBC reported at Rajiv Gandhi Cancer Institute & Research Centre (RGCI&RC), Delhi, India.

Methods Over a period of 20 years (1996-2015), all the GBC patients registered at RGCI&RC were included from the Hospital Based Cancer Registry.

Results A total of 5478 patients of GBC were registered between 1996 and 2015. Male GBC constitute 30.16% (2.14% of all cancers) in all age groups while in females, it constitutes 69.84% (6.12% of all cancers) in all age groups. Peak age group was 55-64 years with 1769 (32.3 %) cases followed by 45-54 years with 1496 (27.3 %) cases. Adenocarcinoma was the most common morphology and all the cases treated were microscopically confirmed. Also, moderately differentiated tumor grade was most commonly observed. 2080 (40%) of total registered patients took treatment at RGCI&RC. 776 (37.3) cases were treated by Chemotherapy followed by 268 (12.88%) cases by Surgery & Radiotherapy; 200 (9.51%) by Surgery & Chemotherapy; 661 (31.8%) received symptomatic treatment. More than 50% of the cases were reported in late stage and were given symptomatic treatment.

Conclusion GBC has an abysmal prognosis. An early diagnosis is essential as this malignancy progresses silently with a late diagnosis, often proving fatal. Findings from the study indicates that majority of the patients are reported in the middle age group. Primary prevention will arrive once high-risk genes and environmental toxins are clearly identified. The search for risk factors will be greatly helped if a nationwide GBC registry is created and molecular epidemiological studies are undertaken.

APC-18

SURVIVAL AFTER BREAST OR COLON-RECTUM CANCER: DATA FROM THE GAZA CANCER REGISTRY, 2005-2014

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Background This study is part of “EUROMED Cancer Registry Project”, a collaboration among cancer registries facing the Mediterranean sea, starting in 2010 with the aim to enhance the cooperation among registries. We report the survival of patients with breast cancer (BC) or colorectal cancer (CRC) in the Gaza Strip.

Methods The study was conducted among individuals with BC or CRC diagnosis recorded in the Gaza Cancer Registry (GCR), during 2005-2014. Overall, 1360 BC cases (median age: 54 years) and 722 CRC cases (47.5% women; median age: 59 years) were diagnosed in the study period. The survival probability was estimated by Kaplan-Meier method for the totality of study patients diagnosed in 2005-2014, followed-up to 2016. Hazard ratios (HRs) and 95% confidence intervals (CIs), adjusted for major confounders, were computed using Cox proportional hazard model. Data on clinical information, available only for patients diagnosed in 2005-2006, were analyzed more in detail.

Results In the Gaza Strip, the 5-year survival was 65.1% for women with BC and 50.2% for patients with CRC. Cases aged >65 years at diagnosis had a 1.6-fold (BC) and 1.5-fold (CRC) higher risk of death than younger ones. Year at cancer diagnosis did not affect the probability of survival. Among the 178 BC cases and 80 CRC cases diagnosed in 2005-2006, advanced stage and poor grade were significantly associated with a higher risk of death (e.g., HR=2.0 for distant vs localized disease in BC and HR=5.8 for CRC). Conversely, the full access to therapies was associated with a reduced risk of death (HR=0.3 for BC and HR=0.1 for CRC).

Conclusions This analysis indicates a reduced probability of surviving after a cancer diagnosis for patients in the Gaza Strip, likely due to poor stage and grade at diagnosis. This disadvantage was particularly evident for older patients and for CRC patients.

Analysing, presenting and communicating cancer registry data

APC-19

PARTIAL AUTOMATION OF RENAL CELL CARCINOMA REGISTRY USING REDCAP WITH OBIEE

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Introduction The Renal Cell Carcinoma Registry (RCCR) is a hospital-based cancer registry, which is a critical source for clinical audit, research publications, clinical trials and collaborations at the department of Urology, Singapore General Hospital (SGH). Manual data collection and storage in Microsoft Excel reduced RCCR's efficiency in timeliness and security.

Objective We aim to partially automate the RCCR using Oracle Business Intelligence Enterprise Edition (OBIEE) and Research Electronic Data Capture (REDCap) and evaluate the new system's efficiency and security.

Methods The data collection form was created on REDCap. Six reports were designed to retrieve data from SingHealth Electronic Health Intelligence System (eHINTS) on nephrectomy details, general laboratory results, pathology reports, medications, radiology subjects and hospital diagnosis data, respectively. Auto extracted data was then processed and merged with existing manual RCCR data and then uploaded to REDCap. A committee was formed consisting of experts from the Department of Urology, REDCap and OBIEE team to critically evaluate the feasibility and efficacy of the system.

Results The 6 reports were able to provide a timely full list of RCC patients diagnosed/treated at SGH. Twenty six percent of data variables from the RCCR data collection form were retrievable from the 6 reports. Manpower could be reduced by 35% in case-finding and data collection. Direct access via Electronic Medical Records (EMR) also enabled addition of new cases immediately to RCCR with security features. However, the setting-up of the new system required registry expertise and assistance from OBIEE and REDCap team.

Conclusion Partial automation of RCCR is feasible with REDCap with OBIEE, enhancing efficiency and security but statistical and registry knowledge is required.

APC-20

USE OF HISTOLOGICAL VERIFICATION DATA IN CANCER REGISTRY IN KYRGYZ REPUBLIC

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Background One of the most important criteria for assessing cancer registries is quality of laboratory histology data. In Chui Region, Kyrgyzstan, with population of 870,300 there is operating only one pathohistologic laboratory. The Republican Pathology Bureau is the lead agency of the pathohistologic service of the Ministry of Health of the Kyrgyz Republic. All healthcare organizations where locally there are no histological laboratories or where confirmation of the diagnosis of cancer is required refer their material for examination to this laboratory.

Methods 1436 new cancer cases in Chui Region were analyzed. Assessment was made by methods used for confirming the diagnosis of "malignant neoplasm" on data recorded in medical documents. All histologically confirmed diagnoses were coded in accordance with ICD-O-3.

Results Of 1436 registered cancer cases for the pilot Chui Region only 42.3% were morphologically confirmed (MV%). Detailed definition of the morphological type of tumor is given in the diagnostic conclusions extremely rarely. Morphologic diagnosis in hospital patients' histories was described regarding the determination of tumor behavior, but the degree of differentiation is determined extremely rarely. In most cases morphological diagnosis is presented as "carcinoma" or "adenocarcinoma" without further specification (ICD-O-3, 8010/3, 8140/3) – 57.8% or "malignant neoplasm" without further specification (ICD O-3, 8000/3) – 24.8%. Complete histologic diagnosis with specification of morphological type, with the degree of differentiation was indicated only in 17.5% cases.

Conclusion Quality of cancer registry data is directly dependent on quality of results of histologic examination. Inadequate equipment and insufficient personnel capacity of histological laboratories of the Kyrgyz Republic, absent immunohistochemical laboratories do not allow performing quality full-range diagnosis of malignant tumors. Therefore, the completeness of cancer registry data is not adequate. One of priority tasks of national strategies on cancer control in developing countries should be the improvement of quality of cancer diagnosis and, first of all, of histological examinations.





APC-21

INCIDENCE TRENDS FOR MULTIPLE PRIMARY MALIGNANT NEOPLASMS (2010-2014): RESULTS FROM A HOSPITAL-BASED CANCER REGISTRY IN TAIWAN

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Background The high effectiveness of cancer screening and therapies resulted in the increased diagnosis of multiple primary malignancies (MPMNs) in Taiwan. The present study was to investigate the clinical data of patients, and determine the frequency and clinical features of MPMNs.

Methods Of 2,518 patients were obtained retrospectively from a hospital-based cancer registry. We quantified the clinical features and the most common cancer pairs of MPMNs by using statistical and epidemiological indicators.

Results Two hundred and eleven patients with MPMNs were evaluated. The median age at initial cancer diagnosis was 63 (range 12-100 years). The median age of diagnosis of secondary cancer was 67 (range 35-95 years). The median time between initial and secondary cancer diagnoses was 5 months (range 0-57.1). The overall incidence of MPMNs was 8.38%, and the male/female ratio was 2.01:1. The most frequent types of cancer at secondary diagnosis were digestive (3.05%), breast (0.87%), liver (0.87%), head-neck (0.71%), and bladder cancer (0.56%). In women, the most frequently diagnosed cancer pairs were breast/breast (0.88%), digestive/digestive (0.53%), and gynecologic/gynecologic (0.27%). The most common cancer pairs in males were digestive/digestive (1.59%), head-neck/head-neck (0.29%), lung/digestive (0.22%), and prostate/bladder (0.22%). In addition, tobacco smoking, alcohol consumption and betel-chewing were observed to be important risk factors for the development of MPMNs.

Conclusion The cancer registries can help us understand the disease better and use our resources to the best effect in prevention and treatment of MPMNs. Hospital-based tumor registries provide the advantage of cancer survivors' information, however, their therapy-related data are quite limited. In this present study, we discovered that patients with MPMNs tend to be older than those with a single primary malignant neoplasm. In conclusion, the clinical features and the most common cancer pairs of MPMNs are demonstrated in the present study to further analyze the risk factors described.

APC-22

TRENDS IN ELDERLY PEOPLE WHO ARE BUILDING STOMA IN JAPAN

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Background In Japan, elderly cancer patients aged over 80 years or older are aggressively treated similarly to younger people. For example, building ileostomy or colostomy or urostomy is one of the common surgical treatments for the elderly people with cancer of small intestine or colon or urinary organs. In the near future, some of the old patients would feel the difficulty to manage their stoma by themselves because of elderly. We investigated whether the number of elderly people who are building stoma is increasing based on the Japanese population-based cancer registration, especially for the oldest-old patients.

Methods In this study, we surveyed 1,282,727 people who were diagnosed with cancer from 1974 to 2012 and registered in population-based cancer registration of 2 prefectures meeting international standards in cancer registration in Japan. And we calculated stoma-related cancer incidence, incidence rate by age group, age-specific incidence rate of the confidence interval. The reference population was used the Japanese population in 2000, which is the standard in the United States. Then we investigated on the longitudinal trend of these indexes and the stoma related problem to be considered.

Results For example, an upward trend was shown at the each age group from 65 years old to 94 years old in the age adjusted incidence rate of colon cancer at Osaka prefecture. The age group of over 95 years old showed unstable fluctuations at the beginning, however, since 1991 it gradually became stable and showed an upward trend.

Conclusion The prevalence of stoma-related cancer has increased with increasing the number of elderly people. The importance of preparation for the future-coming troubles of the elderly stoma-built patients was suggested.

Analysing, presenting and communicating cancer registry data

APC-23

CANCER RISK IN BASEL BY MUNICIPALITY AND DISTRICT: A POPULATION-BASED CANCER REGISTRY 1981-2010

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Background Basel cancer registry was established by Krebsliga in 1969. The cancer data has been registered in an electronic Database since 1981. We aimed to define cancer risk in Basel city and country by municipality and district.

Methods We used Basel cancer registry database from 1981 to 2010. Cancer data is coded by the International Classification of Disease for Oncology (ICD-O). We calculated age-standardized incidence rates (ASRs per 100,000 populations at risk). The European population was used for standardization. The ASRs were adjusted by age (5-year bands), period (5-year bands) and sex. The confidence interval (95%CI) was calculated by making a Poisson approximation of the binomial variance of the age-specific incidence rate. The municipalities in Basel city are Basel, Riehen and Bettingen. There are five districts in Basel country: Arlesheim, Liestal, Sissach, Waldenburg and Laufen. The Laufen was not included.

Results We observed 21,140 male and 19,366 female cancer cases in Basel, 2,628 and 2,491 cases in Riehen and Bettingen, 14,560 and 12,177 cases in Arlesheim, 4,449 and 3,690 cases in Liestal, 2,398 and 1,849 cases in Sissach, and 1,178 and 944 cases in Waldenburg, respectively. An increase in the cancer rate was seen among all Basel residents from 1981-1985 to 2006-2010: Basel (male: ASR from 627.6 to 692.4; female: 377.0 to 491.0), Riehen and Bettingen (male: 486.7 to 611.2, female: 358.7 to 453.8), Arlesheim (male: 535.8 to 608.6 , female: 357.8 to 467.3), Liestal (male: 511.1 to 528.8, female: 325.4 to 446.6), Sissach (male: 488.3 to 481.2, female: 300.7 to 384.8), and Waldenburg (male: 464.3 to 547.4 , female: 358.4 to 396.9).

Conclusion/discussion Our study shows increased risks up to 26% in Riehen and Bettingen males and 37% in Liestal females. Implementing cancer control program should be a high health-priority in Basel department of health.

APC-24

TREND OF ELDERLY BLOOD CANCER IN JAPAN

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Background Cancer is the most common cause of death in Japan and the number of deaths is increasing due to the aging of the population. On the other hand, the 5-year relative survival rate of the patients with all sites diagnosed from 1993 to 2008 is 59.1% for males and 66.0% for females and the survival rate of cancer is increasing. In this study, we focused on the trend of the number of the patients in the oldest-old age group with blood cancer.

Method In the previous studies of cancer epidemiology, it was classified by age group of 5 years old from 0 to 84 years old and over 85 years old was aggregated. In this study, we proposed three new age groups, 85-89 years old, 90-94 years, and over 95 years in order to clarify the trend of the oldest-old age group. It was investigated on the 2,642,521 patients who were diagnosed as cancer from 1985 to 2010 and were enrolled for the population-based cancer registries of seven prefectures, those satisfied the international cancer registry standard. We employed the patients with the blood cancer of 65 years old or older and calculated age-adjusted incidence by every 5-year old age group. In addition, the characteristics of the three newly created age groups were discussed.

Result The age-adjusted leukemia incidence rate in Osaka showed the gradually increasing trend in each age group of over 75 years old up to 94 years old. The over 85 age group showed almost stable trend from the year 1985.

Conclusion The age-adjusted incidence of blood cancer showed gradual increase trend even in the oldest-old age group. By setting up the three new age groups, the change of the oldest-old age group seemed clarified. The importance of consideration for the effective age classification was confirmed.





APC-25

SAMARA INTERREGISTER – IMPROVED AUTOMATED TECHNOLOGY FOR COLLECTING AND CONTROLLING INFORMATION ABOUT PATIENTS WITH CANCER

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Despite these successes, created at the present time the State system of cancer registries of the Russian Federation has not yet met international standards.

With the introduction of the accounting system of malignant tumors to the level of international requirements in the Samara region developed “Automated system for assessing the quality of diagnosis of treatment of malignant tumors and dispensary observation of cancer patients”, license ? 2010612497 from 09.04.2010g.

On a quarterly basis, the regional segment of the population-based cancer register, the data is exported from the registers. Togliatti and Syzran, and in the regional segment of hospital cancer registry information about cancer patients treated in hospitals of the region. Next is export data “cancer” component of the regional integrated electronic medical record (RIEMR) that contains information about the various procedures cancer screenings, consultations and medical services, are made in the process of clarifying the diagnosis, treatment and prophylactic medical examination of cancer patients, as well as information about the dates and cause of death.

The algorithms of data collection and information control include: verification of primary cancer patients with examination of the reasons for the neglect and methods of active detection; a reconciliation of the dead with the examination of the quality of definition of causes of death; the reconciliation of data on the special treatment is carried out in the current year and for the entire period of observation; reconciliation data on the status of cancer patients and their cancer. Reconciled and verified information is analyzed by forming the reporting forms with the subsequent calculation of indicative indicators.

Thus, on the basis of the Samara cancer register formalized and improved automated technology for the collection, control and examination of information about cancer patients and the expert of regional management system performance of the conditions of oncologic service within.

APC-26

REPORTING MOST COMMON METASTATIC SITES PER CANCER TYPE AND SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PATIENTS WITH METASTASIS

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Cancer Registry of Crete, Greece

Background Metastasis is among the leading causes of mortality in patients with cancer. The metastatic sites depend on the primary cancer type. Nevertheless, the lungs, liver, brain, and bones are common metastatic locations. The aim of this study was to estimate metastatic patterns across major cancer types in the Cretan population and explore the socio-demographic characteristics of patients that have been diagnosed with metastasis.

Methods Data were obtained from the regional cancer registry of Crete, Greece. 4,351 patients diagnosed with metastasis from 1992-2013 were reviewed. Patients inclusion criteria were: a) confirmed metastasis diagnosis, b) confirmed histologically/cytologically cancer diagnosis, c) residency in Crete for at least the past 10 years. Patients with missing information on socio-demographic and clinical characteristics were excluded. All tests were two-tailed ($\alpha=0.05$) and performed in STATA.

Results The most frequent metastatic types of cancer were breast cancer (46.4%) (metastatic sites: bones, liver, lung brain) and bladder cancer (37.5%) (metastatic sites: bones, liver, lung). Other metastatic cancer types included: colon (28.3%) (liver, lung, peritoneum), kidney (27.1%) (adrenal gland, bone, brain, liver), lung (24.5%) (adrenal gland, bone, brain, liver), melanoma (26.1%) (bone, brain, liver, skin, lung, muscle) and ovary (16.9%) (liver, lung, peritoneum). Significant variation among socio-demographic and clinical patients' characteristics was observed in metastatic cancers ($p=0.02$). After adjusting for age and gender, patients with stages III and IV ($b=4.2$; 95%CI=4.0-4.4), working in the agricultural sector ($b=3.5$; 95%CI=3.1-3.9), residing in most deprived areas ($b=3.1$; 95%CI=2.6-3.7), with second primary cancer diagnosis ($b=2.8$; 95%CI=2.6-3.1), with first degree family history ($b=2.7$; 95%CI=2.6-2.8) and smoking history ($b=2.1$; 95%CI=1.7-2.5) presented higher risk for metastatic cancer.

Discussion/conclusion Strongly different metastatic patterns were observed across the major cancer types, while demographic and socioeconomic characteristics that significantly impact on metastasis development were identified. These associations may prove to be useful to clinical oncologists, physicians and scientists.

Analysing, presenting and communicating cancer registry data

APC-27

COMMON PITFALLS DURING CANCER CASE REGISTRATION: LEASONS LEARNT FROM THE CANCER REGISTRY OF CRETE, GREECE

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Background Cancer registries collect and organize demographical and medical data of patients with malignant neoplasms to facilitate cancer epidemiology. Data errors are common in cancer registries' databases and can affect data analysis and interpretation leading to erroneous conclusions. This study aims to report common pitfalls identified during the Cancer Registry of Crete (CRC) registration process and discuss on how to resolve them.

Methods CRC performs monthly and annual evaluation checks utilizing both qualitative and quantitative approaches (Bray and Parkin 2009 guidelines). Evaluation checks include data quality control as well as monitoring of registration errors occurred during registration performed via the digital cancer monitoring system of the CRC. Rates are expressed as percentages (%) of the number of the observed errors in the total number of records (n=90,467).

Results Common errors identified were: a) missing information (demographic characteristics: 10.4%; clinical characteristics: 7.2%; lifestyle factors: 14.9%), b) misclassification of diagnosis (9.6%), c) typing errors (3.5%), d) underreported cases due to unavailable medical files (3.4%), e) underreported cases due to registrars' pitfalls (1.3%). Registration mistakes of lower frequency (<1%) included: delayed registration of second or multiple diagnoses, mistyped dates (e.g. birth, diagnosis, hospitalization) and other technical system's errors. Registrars presented high rates of completeness of the registration forms (81.5%) and overall validity of the registered cases (91%) (tested through capture-recapture studies). Overall rate of error was estimated at 2% after correcting all identified errors.

Discussion/conclusion Although the overall rate of error was low in the CRCs' database, individual fields were variably prone to error; especially those involving descriptive text or requiring an element of interpretation (e.g. treatment, pharmaceutical therapy, co-morbidities). Systematic and comprehensive training of the registrars along with the utilization of computerized systems may enhance cancer case registration and minimize registration errors.

APC-28

REPORTING THE MOST COMMON CO-MORBIDITIES OF CANCER PATIENTS IN CRETE, GREECE

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Cancer Registry of Crete, Greece

Background Literature supports a significant association between cancer diagnosis and increased co-morbidity, while a high level of co-morbidity is also correlated with lower survival of cancer patients. The aim of this study was to report the prevalence of co-morbidities in patients diagnosed with cancer in Crete, Greece and to explore the cancer types that are associated with increased co-morbidity.

Methods 22,701 cancer cases diagnosed during 1992-2013 were extracted from the regional population-based cancer registry of Crete, Greece. Inclusion criteria were: a) confirmed diagnosis for "x" primary cancer, b) a histologically or cytologically confirmed diagnosis of cancer, c) individuals that have been residing in Crete for at least the past 10 years. Patients with missing information on demographical and clinical parameters were excluded. All tests were two-tailed ($\alpha=0.05$) and performed in STATA, while the Charlson's Comorbidity Index (CCI) was used to assess the risk of cancer death associated with co-morbidities.

Results The most frequent co-morbidity in the Cretan population-based cancer cohort was the coronary artery disease (54.5%). Chronic obstructive pulmonary disease (37.9%), cerebrovascular disease (34.9%), diabetes (23%), heart disease and hypertension (22.8%), osteoporosis (22.4%), obesity (20.3%) and mental health disorder (17.1%) followed in decreasing order. Kidney (CCI=3.7), lung (CCI=3.5), bladder (CCI=3.1), endometrial (CCI=2.8), colorectal (CCI=2.7) and breast cancer (CCI=2.5) patients presented the highest mean CCI. Kidney, lung and breast cancer patients presented the highest risk of death due to co-morbidities (Risk Rate= 2.4; 2.1; 1.8, respectively).

Discussion/conclusion The increased co-morbidities of cancer patients and the associated higher mortality underscore the need for comprehensive and integrated care based on the medical condition of the individual patient. The above results demonstrate the need of enhancing physicians' knowledge on the health impact of co-morbidities on cancer patients in order to enhance treatment, introduce preventive treatment approaches and improve cancer survival rates.





APC-29

FAMILY HISTORY: WHICH CANCER TYPES HAVE THE HIGHEST RISK?

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Background The risk of developing malignancy is higher in individuals with a family history; especially those with a first degree relative affected by cancer. The aim of this study was to explore which cancer types have higher probability of inheritance among the Cretan population.

Methods Data on all cancers types (excluding non-melanoma skin cancer) were obtained from the regional population-based cancer registry of Crete, Greece. 22,701 patients with histologically/cytologically confirmed diagnosis of "x" primary cancer and available information on family medical history were included. The Bayesian age-period-cohort regression model was performed to estimate the risk of cancer diagnosis for each cancer type testing for family history and the degree of family relationship (adjusting for age and disease stage at diagnosis). All tests were two-tailed ($\alpha=0.05$) and performed in STATA.

Results Family history was associated with all cancer types (correlation coefficient=0.76; $p<0.001$). It was found to be among the most significant predictors of cancer ($b=3.6$; 95%CI=3.5-3.8), especially in females under 50 years ($b=3.8$; 95%CI=3.6-4.0) and males over 50 years ($b=3.9$; 95%CI=3.8-4.1). Existence of first degree relative with cancer ($b=4.3$; 95%CI=3.8-4.9), relative of the same gender diagnosed with cancer ($b=4.2$; 95%CI=3.7-4.8) and family history of the same cancer type ($b=3.2$; 95%CI=3.1-3.3) increased significantly the risk of cancer. The estimated risk of cancer according to family history varied significantly among cancer types ($p=0.02$). Breast, ovarian, peritoneal, pancreatic and prostate cancer revealed the strongest association (correlation coefficient >0.87 ; $p<0.05$) with family history.

Conclusions Our results identified several cancer types that occur more frequently among close relatives. Efforts should be made to enhance cancer screening in individuals with first degree relatives with cancer and develop national guidelines on cancer screening for people with a family history of cancer.

APC-30

RISK FACTORS FOR BREAST CANCER AMONG WOMEN LIVING IN SETIF, ALGERIA: A HOSPITAL-BASED CASE-CONTROL STUDY

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Background Scanty studies on the risk factors for breast cancer (BC) in women living in Arab Countries have been available so far. An on-going hospital-based, case-control study is presently investigating risk factors associated with BC among women living in Setif, Algeria. We herein report the results with regard to the role of body mass index (BMI) and reproductive factors.

Methods Since 2012, 479 cases of BC and 475 controls have been enrolled in the study and interviewed. Cases were women with incident, histologically confirmed BC without a previous cancer diagnosis. Controls were women age-matched with cases admitted for acute, non-neoplastic conditions to the same hospitals of cases. Information was collected by means of a structured questionnaire investigating personal characteristics, lifestyle habits, anthropometric measures, diet, problem oriented medical history, and history of cancer in first-degree relatives. Unconditional multiple logistic Odds Ratios (OR) and 95% confidence intervals (CI) were estimated after allowance for age.

Results 29.2% of cases and 28.4% of controls were obese (BMI ≥ 30 kg/m²), with ORs for BMI ≥ 30 vs. BMI < 25 of 1.10 (95%CI:0.77-1.57). A statistically significant decrease in BC risk was found in women with elevated parity (OR=0.70 for ≥ 5 children vs. < 3 ; 95%CI:0.49-0.99, and OR=0.80 for 3-4 children; 95%CI:0.57-1.12). Conversely, a significant increase in BC risk was observed in post-menopausal women (OR=2.01; 95%CI:1.34-3.01). No statistically significant associations were documented for age at menarche (OR=1.03 for age=15 vs. < 12 years; 95%CI:0.71-1.49), oral contraceptive use (OR=1.16 for ever vs. ever use; 95%CI:0.90-1.49), or spontaneous abortions (OR=1.31 for ever vs. never; 95%CI: 0.98-1.49).

Conclusions The findings of this on-going case-control investigation indicate that women living in Setif, Algeria, have similar risk factors for BC than women living in other geographical areas, in particular in the Mediterranean countries. Data gathering is still on-going to stabilize estimates.

Analysing, presenting and communicating cancer registry data

APC-31

UNDERSTANDING THE CURRENT CANCER POPULATION IN ENGLAND: DETAILED PREVALENCE ESTIMATES AT THE END OF 2015

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Background With more people than ever being diagnosed with cancer, there is a growing need to understand the current population of those living with and beyond cancer. Previous work has looked in detail at the prevalent cancer population living until the end of 2010[1]; however, with the increase of both incidence and survival, this population is increasing rapidly. This work aims to provide a detailed update of cancer prevalence in England up until the end of 2015.

Methods Registrations of people diagnosed with cancer in England between 1995 and 2015 who were still alive as of 31/12/2015 were extracted from Public Health England's cancer registry to allow calculation of 21 year prevalence estimates. Data were stratified by a number of different criteria including but not limited to: tumour type, sex, age at diagnosis and age in 2015, deprivation, and granular geographic information – including clinical commissioning groups (CCGs).

Results At the end of 2015, there were 1,833,298 people alive who have had a previous diagnosis of cancer—827,157 of whom were male and 1,006,141 were female. Results will be presented showing further breakdowns by different cancer sites and demographic characteristics.

Conclusions Utilisation of more recent cancer registration data has allowed for a more accurate depiction of the current population of people living with and beyond cancer. These granular results allow for an in-depth understanding of this population at both national and sub-national levels, providing support for the commissioning and provision of health and social care services for people living with cancer. Acknowledgments: This work has been produced in partnership between Transforming Cancer Services Team, Macmillan Cancer Support and Public Health England's National Cancer Registration and Analysis Service.[1] Macmillan Cancer Support and National Cancer Registration and Analysis Service. 2015. Available from http://www.ncin.org.uk/about_ncin/segmentation.

APC-32

TRENDS IN THE INCIDENCE AND NET SURVIVAL OF HODGKIN LYMPHOMA (HL) BASED ON HISTOLOGIC SUBTYPE IN THE FRANCIM NETWORK REGISTRY: 1994-2010

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Background We investigated the recent trends in the incidence and net survival of HL, in France during the period 1994-2010, based on histological subtype and age to document the relative stagnation of the survival of HL in France.

Methods This analysis was performed using the FRANCIM network database, combining data from all French cancers registries (20% of the national population). We selected new HL cases, between 1994 and 2010, from 14 registries with at least 5 years of consecutive recordings. These patients were followed-up until 30th June, 2013. Standardized incidence indicators and net survival (Pohar-Perme) are presented according to sex, age, period, and histologic subtype. Evolutionary trends in incidence were estimated by the "Average Annual Percent Change".

Results The analysis included 4,180 incident HL cases. The two major subtypes registered are scleronodular HL (61%) and mixed cellularity HL (14.8%).

In the two sexes, standardized incidence rates (Tis) of HL significantly increased during 1994-2010. Histological subtype analysis showed that only the scleronodular subtype significantly increased in the 15-24y and 25-44y age groups in men and in the 25-44y age group in women. The 5-year standardized net survival for HL is 81% (79-82) in men and 87% (85-88) in women. Net survival for scleronodular subtype is higher in the two sexes than for the mixed cellularity subtype. We observed a 6% increase in net survival in the diagnostic period for only scleronodular HL subtype in the over 45y age groups (11% for 45-64y age group; 28% for over 65y).

Discussion/conclusion Our analysis highlights an increased of the incidence of scleronodular HL subtype in younger patients and an increased of net survival in older patients in the same HL subtype.





APC-33

COMPARISON OF CANCER STAGE AT DIAGNOSIS IN URBAN AND RURAL AREAS

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Background Literature supports that cancer patients living in urban areas are more likely to be diagnosed at earlier cancer stage than those living in rural areas. The present study aimed to investigate urban/rural disparities of cancer incidence in Crete, Greece by focusing on disease stage at diagnosis.

Methods 22,701 cases diagnosed during 1992-2013 were obtained from the cancer registry of Crete. Included patients had: a) confirmed diagnosis of "x" primary cancer, b) histologically/cytologically cancer diagnosis, c) reside in Crete at least for a decade. The Age-Standardized Mortality Ratios (ASMRs) were calculated to compare urban and rural areas, while the Risk Rate (RR) was estimated using a Bayesian age-period-cohort regression model to assess the risk of cancer incidence at a later stage between urban and rural areas of Crete. All tests were two-tailed ($\alpha=0.05$).

Results Major variations were observed in cancer incidence, with the more rural municipalities presenting higher risk ($RR_{lowrurality/highrurality}=2.1$, $95\%CI=1.7-2.5$). Most patients were diagnosed at stage II (24%) and stage I (22%), while stage IV and III followed with 19% and 18%, respectively. Nevertheless, the stage at diagnosis varied among municipalities based on the place of residence (urban areas: predominantly stage I; rural areas: predominantly stage II). Municipalities of high rurality and deprived population groups presented a high percentage (65%) of cancer cases diagnosed at stage III. Moreover, rural areas with highly deprived population groups presented higher risk of cancer diagnosis at a later stage ($RR=3.7$; $95\%CI=3.5-3.9$), especially in females over 50 years ($RR=3.9$; $95\%CI=3.3-4.5$).

Discussion/conclusion This study confirms the important differences of cancer stage at diagnosis between and within the urban and rural areas of Crete. There is an urgent need for health policy makers to lift the barriers to oncological care access and to promote cancer screening protocols among rural and most deprived residents of Crete.

APC-34

TREND OF CANCER INCIDENCE IN NEPAL FROM 2003 TO 2012

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Background Trends in cancer incidence is a key tool to identify the pattern of cancer of any country. This retrospective study was performed to present the trends of change in cancer incidence in Nepal. The total number of cancer cases in males was 26,064 while the total number of female's cancer cases was 29,867 throughout the 10 years from 2003 to 2012.

Material and methods Data were collected by all the hospital-based cancer registries of Nepal. The crude incidence rate of cancer (per 100,000) for both sexes was calculated. We had also calculated the age standardized rate (ASR) for both sexes. Crude incidence rate of cancer in males and females by age groups was also performed. Statistical analysis was performed using SPSS (version 23.0) and Microsoft Excel 2010.

Result The cancer incidence per 100,000 in males was 12.8 in 2003 and 25.8 people in 2012. Similarly, in females, the crude incidence rate was 15.1 in 2003 and 26.7 per 100,000 in 2012. Cancer incidence was low at early age but it was increased with age in both sexes in Nepal. Lung cancer was the most common cancer in males throughout, while it was the third most common cancer in females. Cervix uteri was the most common site of cancer in females throughout the 10 years, with a clear trend for increase in breast cancer within this time.

Analysing, presenting and communicating cancer registry data

APC-35

EXPANDING REGISTRATION OF CENTRAL NERVOUS SYSTEM TUMORS AMONG ADOLESCENTS AND YOUNG ADULTS IN SOUTHERN-EASTERN EUROPE

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Background Reports on the epidemiology of central nervous system (CNS) tumors in the distinct age group of adolescents and young adults (AYAs, 15-39 years) are rather scarce compared to children and older individuals. The aim of the study is to present incidence rates of malignant CNS tumors among AYAs in South-Eastern Europe (SEE) and compare to those from the Surveillance, Epidemiology and End Results (SEER), US.

Methods Expanding an already established collaboration from 14 registries in 12 SEE countries, 11438 ICD-O-3 and ICD-10-defined malignant CNS tumors, diagnosed during variable periods ranging between 1990-2014, were retrieved. Incidence rates by age, gender and histology were calculated and temporal trends were evaluated with Poisson and Joinpoint regression. Comparisons with the SEER database (N=13573; 1990-2012) were undertaken.

Results Quality of registration, evaluated by death certificate only diagnoses, morphologically verified diagnoses, and cases of unspecified morphology, varied among SEE registries. The age-adjusted incidence rates of malignant CNS tumors, ranged widely from 14.2 (Romania-Cluj) to 44.1 (Serbia) cases per million individuals in SEE registries and were overall significantly higher (28.1/million) compared to SEER (24.7/million). Astrocytomas comprised half of the cases in both regions, albeit the higher proportion of unspecified cases in SEE (30% vs. 2.5% in SEER). Similar age and gender distribution patterns were observed in both regions. Bidirectional temporal trends in incidence were documented in SEE registries with annually increasing rates in Greater Poland, Portugal North, Turkey-Izmir and Ukraine vs. a decrease in Croatia.

Discussion/conclusion The first report on AYAs CNS tumors from the SEE area shows higher overall incidence compared to the USA despite the presumably lower quality in some of the SEE registries. Hence, it emphasizes the need for improvement in registration practices as to establish a better picture of incidence in this age group and allow for further in-depth investigation.

APC-36

SURVIVAL DISPARITIES IN ADOLESCENTS AND YOUNG ADULTS WITH CENTRAL NERVOUS SYSTEM TUMORS IN SOUTHERN-EASTERN EUROPE

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Background Cancer in adolescents and young adults (AYAs; 15-39 years) is considered an entity with distinctive characteristics and worse outcome compared to other age groups. The aim of this study is to explore whether mortality and survival patterns, specifically from malignant central nervous system (CNS) tumors among AYAs in South-Eastern Europe (SEE) and compare to respective figures in SEER, US.

Methods Malignant CNS tumors in AYAs diagnosed during a period spanning 1990-2014 were retrieved from 14 population-based cancer registries in SEE and SEER. Survival patterns were evaluated with Kaplan-Meier curves and Cox proportional hazard models based on a total of 10078 and 13010 incident cases with available follow-up information in SEE and SEER, respectively. Age-adjusted mortality rates were calculated for the respective countries using data from the respective national statistical services.

Results Mortality rates were overall higher in the participating SEE countries (ranged from 11.8 to 18.5 deaths per million) compared to the US (9.4/million); rather decreasing trends were, however, noted in both regions. Increasing temporal trends in survival rates were recorded for the common period 2001-2009 in both regions. Nevertheless, overall 5-year survival rates were considerably lower in the SEE registries (46%) vs. SEER (67%), a finding consistent across age groups and histological subtypes. Ependymoma was the subtype with the highest 5-year survival (SEE: 76% vs. SEER: 92%), whereas the lowest was recorded for glioblastoma and anaplastic astrocytoma (SEE: 28% vs. SEER: 37%). Advancing age, male gender and rural residency at diagnosis were identified as negative predictors of outcome in both regions.

Discussion/conclusions Despite definite survival gains over the last years, considerable outcome disparities among AYAs with malignant CNS tumors between the less affluent SEE region and the US point to healthcare delivery inequalities. No considerable prognosis deficits for CNS tumors are evident for AYAs when compared to children.





APC-37

RISK CLASSIFICATION OF METASTATIC GERM CELL TUMOURS IN THE NETHERLANDS ACCORDING TO THE IGCCC: A NATIONWIDE POPULATION-BASED STUDY

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Background The International Germ Cell Consensus Classification (IGCCC) is an internationally accepted clinical classification to categorize metastasised germ cell tumours (GCTs) patients into good, intermediate, and poor prognosis groups. However, the IGCCC is based on clinical trial data from the period 1975-1990. The aim of this study is to examine whether the IGCCC is applicable on current GCTs patients.

Methods Nationwide population-based data of adult male patients diagnosed with GCTs in the period 2000-2014 were retrieved from the Netherlands cancer registry. Descriptive statistics were used to provide insights in the clinical characteristics of the study population stratified by seminoma and non-seminoma patients according to the IGCCC groups. We calculated the overall survival (OS) and relative survival (RS) for each IGCCC group.

Results A total of 2,165 patients were selected for analyses. The distribution of patients was quite similar with the original IGCCC publication for seminoma GCT patients. In our study, however, more non-seminoma patients had a poor prognosis (22% versus 16%). The 5-year OS for the good and intermediate prognosis group of the seminoma patients was 92% and 88%, respectively. For the non-seminoma patients the 5-year OS rates were 97%, 88% and 74% for the good, intermediate, and poor prognosis groups, respectively. Similarly, the 5-year RS rates were 93% and 89% for, respectively, the good and intermediate prognosis group of the seminoma patients. For the non-seminoma patients the 5-year RS rates were 98%, 88%, and 74% for the good, intermediate and poor prognosis groups, respectively.

Conclusion The distribution of patients and OS are quite similar between our study population and the original IGCCC publication. This leads to the conclusion that the IGCCC remains applicable to the current population. However, the better OS in poor-prognosis non-seminoma GCTs patients should be taken into account when using IGCCC in current daily practice.

APC-38

PREDICTION OF CANCER INCIDENCE IN NEPAL

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Background The burden of cancer will increase both in males and females in Nepal. Due to the unavailability of a population based cancer registry it is difficult to precisely predict of future incidence rates. However, using hospital-based data to predict the cancer incidence in Nepal it was found that it will certainly increase both in males and females from 2013 to 2020.

Material and Methods For this research we used the cases from the first national cancer registry report (2003) to the cases of the most recent (2012) accumulated by all the hospital based cancer registries in Nepal. We used simple linear regression to analyze the data and thereby obtained a simple linear regression equation.

Result In 2020 the highest incidence rate will be for males 38.5 per 100,000 and for females, 41.4. The present study demonstrated that female cancer incidence will be higher than that in males in Nepal.

Conclusion This study provided evidence of future trends, which will feature an increasing rate of cancer in Nepal.

Analysing, presenting and communicating cancer registry data

APC-39

'AM I NORMAL?' PATIENTS WITH LYMPHOMA WISH TO COMPARE THEIR PATIENT-REPORTED OUTCOMES TO THEIR PEERS

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Background Providing feedback to patients on their patient-reported outcomes (PRO) can help patients in monitoring their functioning and symptoms and may help empower them.

Objective This study investigates whether patients with lymphoma wish to receive PRO feedback, including the option to compare their scores to their peers, and how this feedback is evaluated.

Methods This study is part of the Patient Reported Outcomes Following Initial treatment and Long term Evaluation of Survivorship (PROFILES) lymphoma registry. This is a longitudinal population-based observational study whereby patients with Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL) as diagnosed by the Netherlands Cancer Registry (NCR) in 9 hospitals in the Netherlands complete questionnaires either on paper or online for research purposes. Sixty-four patients participating in the lymphoma cohort who were eligible for a follow-up questionnaire were invited and given an option to receive PRO feedback. Patients completed questions about health-related quality of life (HRQoL) and symptoms. Clinical characteristics, i.e. gender, age, type of lymphoma, date of diagnosis, stage at diagnosis and primary treatment were obtained from the NCR. PRO feedback was provided via bar-charts.

Results Forty-five of 64 invited patients participated (response=70%) and 36 patients (80%) wished to receive PRO feedback. The vast majority (34/36=94%) compared their scores to a lymphoma reference cohort, and 64% (23/36) to a normative population without cancer. All patients wished to receive feedback on their HRQoL and 81-92% on their functioning, fatigue, neuropathy, anxiety and depressive feelings. Ninety-seven percent reviewed the PRO feedback as useful, with reassurance and knowledge about own functioning in relation to what is 'normal' as most frequently mentioned arguments.

Conclusions A high number of patients with lymphoma wish to receive PRO feedback. Patients reported the comparison of their scores to a lymphoma reference cohort as most valuable. Research should demonstrate if PRO feedback could increase empowerment and possibly improve HRQoL.

APC-40

THYROID CANCER INCIDENCE AND SURVIVAL IN TAIWAN, 1995-2014

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Background Thyroid cancer incidence is increasing worldwide, while mortality from thyroid cancer is stable or decreasing. Consequently, survival rates are rising. This study aims to evaluate time trends in the incidence, mortality, and 5-year survival of thyroid cancer in Taiwan in 1995-2014, in light of the global trends.

Methods National Taiwan Cancer Registry database provided updated information regarding cancer incidence and the Death Certificates Database provided information on cancer mortality, which enabled computation of survival rates. Thyroid cancer Incidence and mortality rates were age-adjusted to the WHO 2000 world standard population. The average annual percent change (AAPC) by joinpoint regression analysis were calculated to assess incidence trends over time by gender and histological types. Relative 5-year survival rates were estimated by gender and histological types and followed-up to 12/31/2015.

Results In 1995-2014 significant increases in the incidence of thyroid cancer were observed, with an AAPC of 5.0% for women and 6.4% for men, both driven almost entirely by papillary carcinoma (AAPCs of 6.2% and 8.3%, respectively) and papillary microcarcinoma (AAPCs of 18.7% and 24.4%, respectively) for women and men; while rates of other types of thyroid cancer remained stable or slightly increased. In order to evaluate an impact on overdiagnosis, the incidence trends of all thyroid cancer excluding papillary microcarcinoma were recalculated and the AAPCs of 3.5% for women and 5.1% for men were still significantly increased. During the same period, a significant reduction in thyroid cancer mortality was observed in women (AAPC -2.7%) and no substantial change in men. The 5-year relative survival has increased from 1995-1999 (women 94%; men 84%) to 2010-2014 (women 97%; men 91%).

Conclusion The thyroid cancer incidence and mortality in Taiwan closely follows global trends, and our findings show that the observed increase in incidence is derived from true increase in disease occurrence.





APC-41

INCIDENCE TRENDS OF SQUAMOUS CELL AND ADENOCARCINOMA OF THE UTERINE CERVIX

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Background The incidence of invasive cervical carcinomas (CC) decreased considerably after the introduction of the Pap test in the early 1970s. Recent international studies showed, however, that incidence rates declined for squamous cell carcinomas (SCC) only, while they appear to rise for adenocarcinomas (AC). In preparation of a research agenda concurring with the planned implementation of a new, organized CC screening program in Germany, the current incidence trends for SCC and AC were analyzed in a regional German cancer registry.

Methods All invasive CC (ICD10: C53) occurring in the Münster district (population appr. 2,7 million) between 1994 and 2014 were classified according to ICD-O-3 into SCC, AC (including adenosquamous carcinoma) and other specific or unspecific malignancy. In addition to age specific rates, trends were calculated using joinpoint regression (* = statistically significant).

Results We evaluated 2,721 cases with C53, of which 1,952 were SCC, 491 AC and 278 other malignancies. The crude CC incidence rate fell from 11.4 (1994) to 9.9 cases per 100,000 women (2014). Among women below age 40, the rate of SCC was, after an initial decline, fairly constant until 2010 and increased again thereafter (APC: +11.6% *). In the 40-64 and 65+ age groups, the SCC rates fell consistently (-1.0% and -2.7% *, respectively). Of note, the rate of AC increased most markedly in women younger than 40 years (+ 5.35% *), while increases were less pronounced in the age group 40-64 years (+1.07%) and 65 + years (+0.94%). The rate of other and nonspecific malignancies decreased in all age groups (0-39: -2.7%; 40-64: -6.92% *; 65+: -9.54% *).

Conclusions The present study confirms the increase in adenocarcinomas of the cervix, most notably in the young. The current increasing incidence trend for SCC among younger patients should be further monitored. The declines in nonspecific malignancies were most probably attributable to rising completeness of reports from pathologists.

APC-42

POPULATION-BASED SITE-SPECIFIC CANCER INCIDENCE RATES IN NORTH CYPRUS

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Limited number of studies have analyzed incidence of cancers in north Cyprus. These studies often utilize data of unknown quality where completeness has not been addressed and are hospital-based.

North Cyprus Cancer Monitoring, Evaluation and Education Center (KKKIDEM) was established in 2015 as the first population-based cancer registry covering all of north Cyprus. Through efforts of KKKIDEM, a national cancer advisory board have been formulated with over 30 members all actors including representatives of civil society organizations, public and private clinicians, academicians and politicians who work with people living with cancer in north Cyprus. KKKIDEM has also drafted legislation on mandatory reporting of cancer cases to council of ministers in north Cyprus.

Two full-time certified registrars, two part-time clinicians (one 40% part-time, one 20% part-time) and a part-time epidemiologist (20% part-time) have recorded all cancer cases who received a diagnosis in 2012 using CanReg5. The registry was audited and recommendations were formulated with the team from International Agency for Research on Cancer Izmir Hub. This paper reports for the first time incidence rates of population-based site-specific cancer standardized with the north Cyprus population 2011 census data available from national planning organization. IACR standards and guidelines have been followed regarding classification and coding of cancers, definitions of incidence and incidence date, for recording new primaries, multiple primaries and metastasis and recurrence. Regarding staging of cancers, SEER Summary Staging Manual – 2000 has been used for 2012 cases due to limited TNM staging data available (only 30% completeness). Analysis of incidence was carried out with CanReg5 and R program. Age-standardized rates were computed using 2011 north Cyprus census data and World Standard Population. Crude rates were also calculated. Chi-square tests have been performed to detect incidence rate differences with respect to categorical variables such as the stage of cancer reported and sex. The study findings suggest similar incidence rates with neighboring communities such as with Republic of Cyprus. This study for the first time reports the population-based site-specific cancer incidence north Cyprus.

Analysing, presenting and communicating cancer registry data

APC-43

DIFFERENCES IN DISEASE PRESENTATION AND TREATMENT OF COLORECTAL CANCER IN TWO REGIONS IN SPAIN

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Objective The aim of this study is to compare disease presentation and treatment of colorectal cancer between two Spanish regions: Granada and Girona.

Methods Primary cases of invasive colorectal cancer in 2011 were obtained from the Granada (GR) and Girona (GI) population-based cancer registries. The following ICD (10th edition) codes were used: right colon (C18.0-C18.5), left colon (C18.6-C18.7), unspecified colon (C18.8-C18.9) and rectal (C19.9-C21.8). Data of diagnostic procedures, stage (clinical and pathological, TNM 7th edition) and treatments were collected from clinical records.

Results Overall, 1,050 cases were included (535 from GR and 515 from GI; 61% men and 33% under 65 years). About 45% of cases were stage I-II; 27% were stage IV. 34% were sited in right colon, 32% left colon and 34% rectal cancer.

Colonoscopy was done in 86% of patients (83% GR; 88% GI), CT MRI colonography in 14% (24% GR; 5% GI) and barium enema in 7% of both regions. More than 11 lymph nodes were examined in 61% of cases in GR and 82% in GI, undergoing non-polypectomy surgery.

Surgery was performed on 83% of patients (similar in both regions), with differences between stages (95-96% I-III vs 57% IV). Hemi-colectomy (HC) and segmental resection (SR) was performed in similar percentages in both regions for right colon and rectum. Significant differences in left colon were observed: in GR 66% with HC vs. 14% with SR; in GI 21% with HC vs. 62% with SR. Chemotherapy was administered on 47% of patients (17% stage I; 66% stage IV). Radiotherapy was indicated in 51% of rectal cancers.

Conclusions Although nearly half of colorectal cancers were diagnosed in early stages, 27% were detected with metastasis. Surgery was the most used therapeutic procedure in early stages, and chemotherapy was indicated in advanced stages, whereas radiotherapy represented an important part of treatment in rectal cancer. The high percentage of cases with enough lymph nodes examined evidences a good surgical practice. Funding: HIGHCARE (Exp.:AC14/00036)

APC-44

GALL BLADDER CANCERS IN INDIA – A REPORT FROM POPULATION BASED CANCER REGISTRIES (1982-2010)

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Background As per Globocan Chile has the highest rate of gallbladder cancer, followed by Bolivia and Bangladesh. About 66% of gallbladder cancer cases occur in developing countries. Cancers of Gall Bladder are important due to its etiological factors and approaches to diagnosis. The present study aims to analyze various epidemiological aspects of Gall Bladder Cancers among Indian Population.

Methods This descriptive study has been conducted mainly based on analysis of Population Based Cancer Registry (PBCR) data of different parts of the country from 1982-2010. Epidemiological variables studied include age, sex, basis of diagnosis etc. A comparison of study variables with possible morphological types has been done. Hospital Based Cancer Registry (HBCR) data of same regions were also analyzed.

Results A total of 22404 cases were documented. Out of which 8245 cases occurred among males and 14159 among females which accounted for 1.7% and 3% of total cases respectively. The crude Rates ranged from 0.3 to 2.5 in various Indian registries. Linear trend analysis indicated that incidence increased significantly during the period 1982 through 2010. The incidence rates significantly increased annually in the PBCRs of Bangalore, Bhopal, Mumbai, Chennai, and Dibrugarh District among older registries. The newer registries of Kamrup Urban District and Sikkim state show a significantly rising trend. During 1982-2010 time period, incidence for Gallbladder cancer in broad age groups for females significantly increased annually in age groups in Bhopal and Chennai PBCRs increase in 25-34, 35-44 and for Bangalore in 65 and above age group respectively.

Conclusion The descriptive study indicates female predisposition of the cancer with females to male ratio of 1.7:1 from the PBCRs. A rising trend in relatively younger age group is observed in registries with more number of years of data. A geographic specificity in distribution of Gall Bladder cancer was found





APC-45

PROJECTION OF POPULATION FOR INDIAN PBCR AREAS: AN EMPIRICAL EVALUATION OF DIFFERENCE DISTRIBUTION METHOD

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Background One of the essential requirements of Population based cancer registries (PBCRs) is annual population of the area by quinquennial age groups and sex. Traditionally, exponential growth model (EGM) was used for estimation of population. Recently however, Takiar and Shobana (2009) criticized the existing method and came out with new method, namely, Difference Distribution Method (DDM) claiming it to provide better estimate of age structure. Although DDM has been accepted by the Indian cancer registration authorities, its comprehensive evaluation has been missing. Therefore, objective of this study was to conceptually and empirically evaluate the DDM method.

Methods We used census population for 1991 and 2001 and projected population for the year 2011 and compared the same with that provided by census. In addition, we calculated crude, age specific and age adjusted cancer incidence rates using the population projected by EGM and DDM and that provided by Census and compared the three. Number of cancer cases by five-year age group and sex were obtained from consolidated report of PBCRs covering data from 2009-2011. For age standardized rates, we used world standard population. The analysis was carried out for five PBCRs, namely, Chennai, Mumbai, Bangalore, Bhopal and Delhi, however, detailed age structure comparison was limited to PBCR Chennai.

Results Present study found that both the methods give very similar age distribution and age-specific and age standardized rates.

Discussion/Conclusion DDM is not a population estimation method. It is just a method for arriving at the age distribution. Authors of DDM method failed to use a gold standard like we did in the present study. They advocated the superiority of DDM method based on false imaginations and inadequate evidence. On the other hand, exponential method has sound scientific principles. Therefore, PBCRs should continue exponential growth model till another model is found to fit better.

APC-46

ESTIMATION OF CANCER PATTERN BY MEANS OF HOSPITAL BASED CANCER REGISTRY DATA IN INDIA

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Background Cancer registration is one of the essential requirements of any cancer control programme and required data are obtained from PBCRs. In developing countries however, PBCRs suffer among others, from two major lacunae; one, not being able to cover whole population of the country and two, non-availability of reliable clinical and treatment details for majority of cases. Thus PBCRs in developing countries cover only a small part of the population and cancer patterns observed in these small populations may not be generalized to whole population. Under the circumstances, any attempt to utilize HBCR data for studying the pattern of cancer and trends therein at population level would be of great help. Therefore objective of present study was to explore the potential population based uses of HBCR data and to test their validity in India.

Materials & methods The data from HBCR and PBCR from three places (Mumbai, Bangalore and Chennai) having both types of registries were obtained from published reports for different time periods. Proportion of leading sites, their consistency between PBCR and HBCR and trends therein were evaluated using different indices derived for the purpose. The effect of the removal of patients from outside HBCR area but registered in HBCR (OUTPTSIN) on consistency between HBCR and PBCR was also examined.

Results Substantial differences were observed in leading sites and gross under/over reporting in proportion/incidence of leading sites based on HBCR. The sites easy to access and diagnose were over-represented in HBCR data and others under-represented. Inconsistency between HBCR and PBCR varied among the registries and over the time period. Removal of OUTPTSIN did not improve consistency.

Conclusion There is need to expand the population based cancer registration in India to facilitate effective implementation of cancer control activities, as HBCRs cannot supplement for PBCRs in estimation of cancer pattern.

Analysing, presenting and communicating cancer registry data

APC-47

MDM DATA-ENTRY FEEDBACK EFFECTIVENESS

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Background The Cancer Patient Pathway System (CaPPS) was implemented in 2009 to facilitate Multi-Disciplinary Meetings (MDMs). It monitors Cancer Waiting Times (CWTs), facilitate audit, and aids communication between members of the MDM and primary care. It is also a valuable data source for cancer registration. Cancer incidence has increased by 10.9% since 2009 and data entry in key CaPPS clinical fields was falling. We undertook of an audit to quantify data entry into CaPPS, and measured the impact result of feedback to MDMs.

Method Information for each patient who had a Confirmed Lung, Head and Neck, Colorectal or Breast Cancer and diagnosis date between January 1st 2013 and April 30th 2016 was extracted from CaPPS. All duplicate records were then removed. For each field in CaPPS, the percentage of cases which had data entered in were calculated. Results were then feedback to the MDMs.

Results Mandatory CaPPS fields i.e. CWT, patient demographics and fields regarding referrals; showed high utilisation and 100% data completeness. However, non-mandatory clinical fields such as MDT Agreed Stage, Performance Status and Co-Morbidities produced variable data entry results 0-85% depending on tumour site and HSC Trust of residence. Feedback produced increases in field completeness. Data entry results varied significantly depending on tumour site, CaPPS clinical field, and HSC Trust of Residence. The highest level of change was in the Head and Neck MDM with clinical data for notable key CaPPS fields increasing by +75%.

Conclusion Working with the MDM in a feedback loop can improve data quality.

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APC-48

METHODS' STANDARDISATION AS TOOL TO DEVELOP THE SECOND SWISS CANCER REPORT (2016)

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Background

- 14 regional cancer registries cover 94% of the Swiss population;
- Cancer is a public health concern because of the high mortality, the increasing number of new cases and prevalence;
- Analyses of cancer registry data, their presentation and communication play a pivotal role in monitoring the cancer burden and setting-up national public health priorities;
- Our work presents processes and methodological bases used to elaborate the second Swiss Cancer Report.

Methods

- Set-up of a task force gathering the Federal Statistical Office, the National Institute for Cancer Epidemiology and Registration and the Swiss Childhood Cancer Registry: definition and agreement on the work's aims, coordination and knowledge sharing;
- Standardisation of the methods used to elaborate the report (same definitions, consensus on the process and choice of the key epidemiological measures);
- Revision of the first cancer report (2011) and validation of a chapter's template for all cancer localisations;
- Choice of communication channels.

Results

- Standardized description of cancer measures (incidence, mortality, survival, cumulative risk, prevalence and prognosis) overall and per cancer localisation;
- Comparisons with similar European countries;
- Text minimized to key messages and easy readability;
- Standardised presentation of tables and figures;
- Separate "Method Report" to extensively describe the methods and to simplify the reading of the main report;
- Report, press release and website in four languages.

Discussion/conclusion

- Stimulating: to exchange scientific knowledge between the three independent institutions and to critically debate on cancer analyses and their presentation and communication;
- Important: to define the goals in advance, to reach consensus on the process, to set up the methods and content of the report;
- Mandatory: to standardise the report's body as well as the description of the results in order to facilitate the development, the diffusion and the reading of the report;
- Challenging: to describe and present the results in a comprehensible way for lay readers.





APC-49

POPULATION-BASED INFORMATION ON CANCER STAGE AT DIAGNOSIS IN THE EUROCARE-5 STUDY: AVAILABILITY, COMPARABILITY, AND ANALYSES

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Background For the first time (EUROCARE-5 round) many EUROCARE cancer registries (CRs) included stage at diagnosis in their files. So new quality control procedures had to be developed to assess this information and help to decide which data were comparable and could be analysed for stage-specific survival.

Methods Three staging forms (TNM, condensed TNM, and Extent of Disease) available in the EUROCARE database were analysed for patients (≥ 15 years) diagnosed with malignant cancers of breast, colon, rectum, stomach, thyroid, lung, and skin melanoma in 2000-2007 across Europe.

A method to render the three staging systems compatible so as to check one against the other (when at least two were provided) was developed as well as an algorithm to produce a “reconstructed stage” from all the available information to thereby minimise the amount of missing data.

Results A good concordance of the three forms of stage information was found for the majority of CRs. Mainly because of missing stage information, especially whether or not metastasis was present, for only 34 of the 62 CRs that sent in data, was it possible to perform “definitive” stage-specific analyses. Both frequency and survival analyses for “reconstructed stage” were consistent with previously published results for individual cancers. Furthermore, Eastern European CRs showed high proportions of patients diagnosed with advanced stage and lower local stages than the EU mean.

Discussion Cancer registries are the fundamental source of population-based cancer data to assess cancer burden, provide clues to causes, inform the design of cancer control initiatives, enable the evaluation of mass screening programmes, and monitor health service quality.

Our investigations show the feasibility for cancer registries of collecting cancer stage at diagnosis, however, improvements in availability and coding of this information is necessary and adequate resources should be allocated to CRs for this task.

APC-50

A COMPARISON OF HEAD AND NECK CANCER IN ASIAN COUNTRIES

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Background and methods Head and neck cancer (HNC) continues to be a significant problem worldwide. We used population based registries from three Thai cities (Songkhla, Chiang Mai, Lampang), Singapore, Philippines, and Shanghai, to characterize the age-standardized incidence rates of HNC by sex and compared them to rates observed in the United States. Cancer cases were selected by ICD-10 code from International Agency for Research on Cancer (IARC) C15plus database as well as the Songkhla Cancer Registry for the following sites: oral cavity (00, 03-06), tongue (01-02), pharynx (09-10, 12-14), and larynx (32). The data were analyzed using R software (3.1.1) and Joinpoint Regression Software (4.4.0) to determine age-standardized incidence rates, trends of annual percent change, and comparability tests of parallelism and coincidence. Incidence rates were standardized using the Segi (1960).

Results As expected, males have higher incidence rates of HNC than females at across all the countries. Trends are consistently decreasing among females, with the highest rates being observed in United States (ASR: 4.90 per 100,000) and the Philippines (ASR: 3.69 per 100,000) and the lowest rates being observed in Shanghai (ASR: 1.83 per 100,000) and Singapore (ASR: 1.57 per 100,000). Among males, highest incidence rates are seen in Songkhla (ASR: 17.41 per 100,000) and the United States (ASR: 14.18 per 100,000) and lowest incidence rates in Chiang Mai (ASR: 5.11 per 100,000) and Lampang (ASR: 4.95 per 100,000). Among males, trends seem to be decreasing with the exception of Shanghai, where incidence has been increasing since 1998 (APC: 7.87, $p < 0.05$). In contrast, rates in the Philippines have been drastically decreasing among both males (APC: -5.71, $p < 0.05$) and females (APC: -13.57, $P < 0.05$) since 1995 and 1997, respectively.

Conclusion Although HNC rates do seem to be decreasing across both Asian counties and the United States, disparities across gender and country do still exist.

Analysing, presenting and communicating cancer registry data

APC-51

MOLECULAR SUBTYPES IN INFLAMMATORY BREAST CANCER: A DESCRIPTIVE ANALYSIS USING THE NETHERLANDS CANCER REGISTRY

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Background We analysed the influence of molecular subtypes on pathologic features, pathologic complete response (pCR), incidence of metastases, overall (OS) and disease-free survival (DFS) in inflammatory breast cancer (IBC).

Methods All IBCs (cT4d) diagnosed in 2006-2015 were selected from the nationwide Netherlands Cancer Registry. Patients were classified based on hormonal receptor (HR) and HER2 status: HR+/HER2-, HR+/HER2+, HR-/HER2+ (HER2-positive), HR-/HER2- (triple negative), and not further specified (NFS). Patient-, tumour- and treatment-related characteristics were compared among the subtypes. pCR (absence of residual invasive cancer in the surgically removed breast and axillary lymph nodes following neoadjuvant chemotherapy) was analysed in patients who underwent surgery. For a specific subgroup of patients diagnosed in 2006-2008, who received surgery and had no distant metastases at diagnosis, additional 5-year follow-up on recurrences was available. Kaplan-Meier analysis was used to calculate 5-year OS and DFS.

Results In total, 1,876 IBCs were identified, of who 737 (39.3%) were HR+/HER2-, 275 (14.7%) were HR+/HER2+, 369 (19.7%) were triple negative, 307 (16.4%) were HER2-positive, and 188 (10.0%) were NFS. In general, triple negative subtypes were more likely to have a higher grade, more positive lymph nodes and distant metastases at diagnosis compared to the other subtypes. In total, 181 patients (22.4%) achieved pCR, of who most were HER2 positive ($p < 0.001$) and least were triple negative. Five-year OS was 46.1% for the entire cohort, which was highest for HR+/HER2- and lowest for triple negative. The 2006-2008 subcohort included 152 patients, with a similar distribution of molecular subtypes. Overall, 5-year OS and DFS were 47.4% and 50%, respectively, being the highest in HR+/HER2- and the lowest in triple negative.

Conclusion Triple negative IBCs had less favourable characteristics, presented more often with distant metastases, were less likely to achieve pCR, and showed worse 5-year OS and DFS compared to the other subtypes.

APC-52

PROJECTIONS OF BURDEN OF CANCERS: A NEW APPROACH FOR MEASURING INCIDENCE CASES FOR INDIA AND ITS STATES - TILL 2025

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Background Changing way of life, rising longevity and progressive control of communicable diseases has led to emergence non-communicable diseases, which emerged as an important public health problem in India and other developing countries during second half of last century. Burden of cancer is a one of measure contributor among non-communicable diseases in India, which accounts for around 7,06 thousands of cancers cases in males and 6,66 thousands in females in 2015. Hence, the objective of this study was to assess the burden of cancers by place of residence for India and its states for 2015-25.

Material and methods National Cancer Registry Programme (NCRP) is only a reliable source for data on cancer in India. The cancer incidence rates were taken into account from Population Based Cancer Registries (PBCRs) generated by population based cancer registries under NCRP and population of India and states were taken from the report 'projected by Registrar General of India' formed the sources of data. Best possible assessment for incidence rates for non available registry states was worked out by using limited available data. The linear regression method was used to assess trend and project the rates for 2015-25.

Results Overall burden of cancers in India was estimated to be 1.37 million in 2015 and it was increase to nearly 1.80 million by 2025, an increase of more than 30.8%. Major portion of this burden was in rural men (three fifth) and in males (more than half). The detailed analysis indicated regional diversity in the burden of different types of cancers.

Conclusion In view of increasing burden of cancers, there is burning need to initiate focused on control measures to combat the same.





APC-53

NATIONAL CANCER REGISTRY; DIRECTING TOWARDS THE NATURE AND EXTENT OF THE CANCER BURDEN IN THE UNITED ARAB EMIRATES

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Background Cancer poses a substantial present and future public health challenge. Registries play a key role in monitoring of cancer survival, mortality, and incidence and demonstrates the disparities across the population. Population-based cancer registries support in assessing and monitoring the effectiveness of cancer control activities. Our aim is to explore the changing trends of cancer with regards to its mortality and incidence which is an essential element in monitoring and planning of program for controlling, preventing, and early detection of cancer.

Methods The data was gathered from different sources by means of active and passive reporting. Active method involved registry staff who regularly visited different sources in conjunction with abstracting data on special forms. While passive reporting involved healthcare providers across UAE, who completed standardized form, collected cancer data from patient's files, HIMS (Health information management system), pathology reports, and sent copies of discharge abstracts to the UAE National Cancer Registry.

Results A total number of 3816 incident cancer cases (malignant and in-situ) were diagnosed among the UAE resident population during the period of 1st January and 31 December, 2014 representing an overall crude incidence rate of 42 cases per 100,000. The pattern of cancer showed an increased burden of colorectal, prostate, and leukemia cancer among the males resident population in the United Arab Emirates. While, Breast, thyroid and colorectal cancer were the top ranked cancers among female residents.

Discussion/conclusion Increased knowledge of the frequency of malignant diseases, their incidence, distribution, and mortality is of primary significance for controlling cancer. This study therefore, supports different efforts involved in harmonizing, expanding, and improving cancer registration in the United Arab Emirates. The results of this report are the first ever published crude incidence and mortality rates on a regional and national level and clearly demonstrates the seriousness of the cancer burden in UAE.

APC-54

TRENDS IN PROSTATE CANCER INCIDENCE BETWEEN 1996 AND 2013 IN TWO SWISS REGIONS

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Background Prostate cancer is the most common cancer among men in Switzerland. However, differences in prostate cancer incidence have been observed between the German-speaking and the Italian-speaking part of Switzerland. The aim of this study was to examine incidence trends from 1996 to 2013 stratified by age group, grade and T-stage using data from the cantonal cancer registries of Zurich (German-speaking part) and Ticino (Italian-speaking part).

Methods The dataset included 17,495 men living in Zurich and 3,505 men living in Ticino who were diagnosed with prostate cancer between 1996 and 2013. We computed age-standardized incidence rates per 100,000 (ASR) using the European Standard Population and mid-year population estimates. Time trends were assessed using JoinPoint regression analysis Software.

Results ASR were generally higher in Zurich compared to Ticino (ASR in 1996: 122.8 (Zurich) and 76.9 (Ticino); in 2013: 105.1 (Zurich) and 82.6 (Ticino)). ASR increased significantly between 1996 and 2002 in Zurich and between 1996 and 2007 in Ticino and then decreased. A statistically significant increase was observed in both regions for men aged <65 years, for grade 3 tumors, and for T-stage 2 and 3 tumors. The largest decrease was seen for grade 1 tumors (average annual percentage change for Zurich: -23.9, 95% CI -27.7, -19.9; for Ticino: -19.7, 95% CI -26.6, -12.0). Furthermore, the incidence of tumors of unknown grade or T-stage decreased significantly in both regions.

Conclusions ASR for prostate cancer was higher in Zurich compared to Ticino during the whole period but the difference decreased over time. Furthermore, the time trends in both regions were similar. The distribution of T-stage and grade did not explain the difference in incidence rates. Different use of opportunistic screening may play a role. Further analyses including information regarding lifestyle and screening patterns may help to understand the observed differences.

Analysing, presenting and communicating cancer registry data

APC-55

GLOBAL REGIONAL COMPARATIVE FORECAST OF GASTROESOPHAGEAL ADENOCARCINOMA INCIDENCE OVER THE NEXT TEN YEARS (2017-2027)

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Background Gastric and esophageal adenocarcinoma are malignancies of two distinct organs, but are increasingly viewed as a single clinical entity with similar characteristics and treatment. We estimate the global incidence of gastroesophageal adenocarcinoma by region over the next ten years using a multi-factorial forecast model.

Methods Using a critically appraised set of country-specific cancer registries, appropriate ICD-10 codes and relevant histology proportions, gastric and esophageal adenocarcinoma incidence was estimated for 45 countries grouped into six distinct regions and representing approximately 90% of the world's population. In developed countries, known modifiable risk factors like Helicobacter-Pylori infection, smoking, dietary fruit, vegetable and salt intake were used to trend incidence over the forecast period. For developing countries, gross domestic product (GDP) per capita was considered as a proxy for multiple risk factors associated with gastroesophageal cancer. A trend based on the correlation between estimated GDP per capita and age-standardized incidence was adopted. To estimate the number of incident cases globally, aggregate estimates for each region were divided by the proportion of countries in that region for which direct estimates were made using the methods described above.

Results Gastroesophageal adenocarcinoma incidence varied from 2 per 100,000 in Africa to 66 per 100,000 in high-income Asia-Pacific. Incident cases was highest in lower-income Asia-Pacific (797,000) and lowest in Africa (25,000). Over the next ten years, lower income countries are projected to have the highest growth rates (36% in Latin America, 30% in Africa, and 28% in lower-income Asia-pacific) with smaller increases in the higher income countries.

Conclusion The incidence of gastroesophageal cancer varies by region globally. Despite declining risk of gastroesophageal adenocarcinoma among most countries, there is a forecasted increase of incident cases over the next 10 years attributable to aging population demographics. Keywords: Gastroesophageal adenocarcinoma, incidence, forecast, gross domestic product per capita.

APC-56

THE FORECAST OF CANCER INCIDENCE IN POLAND

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Background Polish society undergoes changes similar to those in other European countries - an increase in the share of the elderly people and a low birth rate are indicative of an increase in the cancer incidence. Additional factors influencing this phenomenon are changes in exposure to risk factors.

Materials and methods Model used data on cancer cases in the years 1980-2016 from the Polish National Cancer Registry. Population data, both historical and forecasted (2017-2030), come from the Central Statistical Office. The forecast was based on the Age-Period-Cohort model. Standardization of rates was performed on the Polish population from 2016 (ASR_P).

Results In Poland in 2016 there were 81207 cancer cases in men and 81588 in women (ASR_P respectively 403/105 and 391/105). Forecast for 2030 is 92183 cases in males and 107084 in females (ASR_P respectively 355/105 and 436/105). There were 14954 lung cancer cases in men in 2016, 7619 in women. Forecast of lung cancer cases in men for 2030 was 14369, in women 9661. There were 10787 colorectal cancers in men in 2016, 8535 in women. Forecast for colorectal cancer in men in 2030 is 15740, in women 11696. There were 15082 prostate cancer cases in 2016; the forecast in 2030 is 35300. The incidence of breast cancer in 2016 was 18322. Forecast for breast cancer cases in 2030 is 24916.

Conclusions Over the next 15 years the number of cancers cases in Poland will increase to over 197000 and the number will be greater among women. The biggest increase in the incidence is predicted for prostate cancer and breast cancer - in 2030 the risk of these cancers in Poland will be similar to that observed in highly developed countries of Western Europe. It is necessary to prepare the Polish health care system for the upcoming "oncological tsunami".





APC-57

CANCER REGISTRY ENHANCING DATASETS FOR PRIMARY CARE

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Background The N. Ireland Cancer Registry (NICR) previously provided feedback to Primary care on cancer patients registered for each Practice. This enabled GPs to easily establish their cancer chronic disease registers and the NICR to check data quality. In Northern Ireland (NI) the 350 General Practices have come together to form 17 Primary Care Federations (PCF). PCFs are not-for-profit healthcare provider organisations, with approximately 20 General Practices and 100,000 patients per Federation. Part of the role of the newly formed PCFs will be an increased focus on caring for patients with chronic conditions (including cancer) within the primary care setting. This increased focus on chronic conditions together with increasing cancer incidence and survivorship will place increasing pressure on Primary care in NI. The aim of this Macmillan-funded project is to report the incidence and prevalence of all cancers and of the main cancer sites for each PCF to support future service planning.

Methods Cancer profiles have been calculated by PCF as place of care with patients assigned to PCFs using GP code at time of diagnosis and follow-up (31st December 2015). To date 98% of the 45,363 incident cases ex. NMSC diagnosed 2011-2015 have been matched to PCF as well as 98% of 58,586 prevalent cases of cancer diagnosed 1993-2015. Average number of cases, 2013 European Age-standardised incidence and prevalence rates have been calculated. Emergency presentation, screening uptake and stage at diagnosis for the main cancers will be analysed by practice demographic profile.

Results Registry routine data can provide information to facilitate care planning and monitor service provision.

Conclusions The N.Ireland Cancer Registry is funded by the Public Health Agency of N.Ireland and this research work has been funded by Macmillan Cancer Support as part of the Macmillan-NICR Partnership. This work uses data provided by patients and collected by the health service as part of their care and support.

APC-58

MELANOMA INCREASES IN MEN -A SUCCESS STORY?

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Background The N.Ireland Cancer Registry has population-based records of skin cancers for over 24 years. Northern Ireland Skin Cancer Strategy and Action Plan aims to reduce skin cancer incidence and mortality, by promoting prevention and early detection. In 2014 a programme provided advice, and resources to employers of outdoor workers, the majority of which are men.

Methods A workshop indicated variation in sun safety practice between organisations, stimulating the co-production of resources, including: a sun protection policy; a sun safety poster; a UV indicator card. Advice on early detection of skin cancer was also provided. Baseline and follow-up questionnaires were analysed to assess improvements. Incidence of all skin cancers including stage was monitored as part of the routine work of the Northern Ireland Cancer Registry.

Results In 2015, 30 organisations completed the baseline questionnaire and 25 completed the follow-up questionnaire. 72% used the policy. 44% performed UV risk assessments (20% at baseline). An increased proportion provided advice on clothing (92% versus 73% at baseline), shade (56% versus 40%) and sunscreen (88% versus 67%). A greater proportion displayed information. After a steady annual increase in melanoma rates of 2.4% in women and 3.9% in men there was a marked increase in 2015 from 22.0 in 2014 to 28.2 (per 100,000) in 2015. The numbers of melanomas registered increased in men by 34%, from 156 cases in 2014 to 209 in 2015. Incidence in women remained largely the same. Among men, a 36% increase in stage 1 and 2 cancers and a slight drop in late stage tumours was observed. This was not observed in women.

Conclusions The increase in melanoma observed in only men likely reflects behavioural change. Timely availability of cancer registry data including stage has a role in evaluation of health promotion activities addressing cancer prevention and early detection.

Analysing, presenting and communicating cancer registry data

APC-59

PROGRESS OF POPULATION BASED CANCER REGISTRY PROGRAM IN I.R. IRAN

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Background I.R. Iran is located in the western Asia with more than 77.5 million populations. The National Pathology Based CR was implemented in 1994. Only one province, Golestan province, which is located in the northeastern part of Iran has high quality PBCR and the results of this registry published in the 10th volume of the IARC monograph “Cancer in Five Continents” in 2013.

Methods Deputy of research in the Ministry of Health and Medical Education launched a program to establish Population Based Cancer Registry (PBCR) in 10 out of 31 provinces. We enhance infrastructure for electronic pathology reports in the pathology laboratories, organized several workshops and training programs, and customized CanReg5 software to register Iranian (Jalali) calendar.

Results The program had successful results and 2 provinces, including Fars and East Azerbaijan provinces achieved the objectives and managed to prepare the first annual report with high quality results. Different stakeholders in the ministry of health, including deputy of health, treatment and research signed an agreement to support the regional PBCRs and report cancer incidence rates in all the provinces.

Conclusion The microscopic verification was 85% and 70% in the Fars and East Azerbaijan and the DCO% was 10% and 20% in the Fars and East Azerbaijan provinces, respectively. The incidence rates of cancer were 125 per 100,000 in women and 158 per 100,000 in women of Fars province. The rates were 150 per 100,000 in women and 182 per 100,000. The data from other provinces are also coming. We will report the activities and progress of cancer registry program in I.R. Iran.

APC-60

HOSPITAL BASED CANCER REGISTRY (HBCR) IN THE CANCER INSTITUTE OF IRAN: FIRST ANNUAL REPORT

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Background Hospital-based cancer registries (HBCR) maintain data of cancer patients on diagnosis, procedures, treatment, and follow-up in a particular facility. HBCR is important tool for hospital management and evaluation of the quality of care and supporting population based cancer registry and cancer control program. In addition, HBCR creates important infrastructure for clinical cancer research. We aimed to report the results of the first HBCR from cancer institute of Iran (CIIR).

Methods We developed standard questionnaires, and procedures for HBCR. In addition, we modified Canreg5 software for registration and developed Canreg5 database for five cancer types, including breast, colorectal, stomach, esophagus, and melanoma. Data were collected from in patient wards, outpatient clinics, radiation oncology, and pathology departments, and etc. We further defined specific criteria for inclusion and exclusion of the patients in the registry. A specific variable named “Class of Case” kept the latter information. We saved the basic records of the excluded cases. In this report, we have analyzed data for 1393 (2014) for these five cancer types from the CIIR. We also signed agreements with different hospitals in the country to establish the HBCR networks.

Results The total number of patients who were registered and had inclusion criteria for five cancers types was 1257 patients, including 697 breast, 231 colorectal, 163 stomach, 109 esophageal, and 57 melanoma cancer cases. We have analyzed the data and reported different topography, morphology, stage, age groups, type of treatment from the above patients who were hospitalized in one year in the cancer institute of Iran. In breast cancer about 7 (1%) , 61 (8.7%), 266 (38.16%), 120 (17.21%), 33 (4.73%) patients were stage 0, stage I, stage II, stage III, stage IV, respectively, We could not find stage information of 210 (30.12%) patients and considered them as unknown stage. The most common form of treatment for breast cancer was surgery (n=697) and other treatments included: Chemotherapy (n=236), Radiotherapy (n=349), Immunotherapy (n=109), Hormonotherapy (n=74). We found the about 50% of the patients were living in other provinces and have travel a long distance to receive care in the cancer institute of Iran.

Conclusion We have managed to establish HBCR in the cancer institute of Iran. This registry has become role model in the country and we have signed collaborative agreements with other centers to launch HBCR. Exchange of the data in this network will provide opportunity to study pattern of cancer care in different part of Iran and support development and monitoring of the cancer control program. Key words: Cancer, Registry, Hospital Based Registry, Canreg5 Software, updated report.





APC-61

CHILDHOOD NEUROBLASTOMA IN SOUTH-EASTERN EUROPE AND USA: VARIATIONS IN INCIDENCE BY HUMAN DEVELOPMENT INDEX

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Background Neuroblastoma is the most common neoplasm in infants. Despite recent advances in understanding its biology, the etiology of neuroblastoma remains largely unknown. The study aims at presenting descriptive characteristics of childhood (0-14 years) neuroblastoma in South-Eastern European (SEE) countries in comparison to the US prompting to generation of research hypotheses.

Methods Age-adjusted incidence rates (AIR) were calculated for 1859 malignant neuroblastoma cases retrieved from data available in 13 collaborating SEE cancer registries, including, for the first time, NARECHEM-ST/Greece during variable registration periods between 1990 and 2016 and 3166 cases from SEER/US (1990-2012). Temporal trends were evaluated using Poisson and joinpoint regression analyses.

Results The overall AIR in SEE was significantly lower in SEE (10.1/million), compared to SEER (11.7/million); the difference was maximized for cases diagnosed during the first year of life (43.7 vs. 53.3/million), when one third of cases were diagnosed. A slight male preponderance (male-to-female ratio: 1.1), mostly pronounced among infants in SEE, was also evident. Of note, the incidence of neuroblastoma among infants and young children (1-4 years) was positively associated with the Human Development Index (HDI) of the respective population. Localization and gross histology characteristics of neuroblastoma were similar in SEE and SEER, with abdominal masses representing two thirds of the cases and ganglioneuroblastomas corresponding to 14% of diagnoses. Decreasing trends in infant neuroblastoma were observed in Slovenia, Cyprus and SEER, as opposed to increasing patterns in Ukraine and Belarus.

Discussion/conclusion The lower incidence -mainly of infant neuroblastoma- in SEE as contrasted to that calculated for the US or reported for Central European countries, possibly points to differential by level of development over-diagnosis of at least some infant tumors that could thereafter self-regress. The financial impact and costs in human suffering due to extensive use of modern technology in treating neuroblastoma remain to be assessed.

APC-62

INCIDENCE AND TEMPORAL TRENDS OF CHILDHOOD NEPHROBLASTOMA IN SOUTH-EASTERN EUROPEAN COUNTRIES AND US: PRELIMINARY FINDINGS

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Background Despite therapeutic advances, the etiology of nephroblastoma (Wilms' tumour, WT) remains obscure. The aim of the study was to calculate and interpret differences in incidence rates and temporal trends of WT in 12 South-Eastern European (SEE, 13 registries) countries, comprising an informal network including the Nationwide Registry for Childhood Hematological Malignancies and Solid Tumors (NARECHEM-ST) in Greece compared to those derived from SEER, US.

Methods SEE Cancer Registries yielded 1775 childhood (0-14 years) WT cases in time periods ~1990-2016, whereas 2933 are reported by SEER, out of which 2260 during 1990-2012. Incidence rates were calculated and temporal trends evaluated using Poisson regression and joinpoint analyses.

Results Incidence rates vary widely within SEE countries; during an approximately same time period the overall SEE rate (9.2/106) is marginally higher compared to the one calculated for SEER data (8.3/106). A prominent male preponderance for WT was noted in the first year of life, whereas females outnumber boys in all other age groups (overall M:FSEE ratio:0.91; M:FSEER:0.86). Temporal trends also varied and are difficult to interpret in most of the 12 SEE countries; a high (9.5/106) mean incidence was noted in the NARECHEM-ST registration without temporal (2009-2016) variation whereas increasing are the trends (~ +1.5% annually) in Belarus and Ukraine. Concerning SEER, a statistically significant ~1.50% annual decrease was noted (1973-2013) in the extreme age groups 0 and 10-14 years, which has faded in the most recent period.

Discussion/conclusion The variable patterns of WT occurrence by age and gender stimulate scientific interest regarding the underlying etiology, whereas cross country variation in the incidence and time trends, emerging from comparisons of SEE and SEER registry data used, imply a possible interaction of environmental with genetic factors in the causation of the intriguing disease.

Analysing, presenting and communicating cancer registry data

APC-63

COMPARING SURVIVAL OF CHILDHOOD NEPHROBLASTOMA IN SOUTH-EASTERN EUROPEAN COUNTRIES AND THE USA: PRELIMINARY FINDINGS

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Background Socioeconomic differentials in health care delivery persist even regarding children with cancer. The aim of the study was to calculate, for the first time, survival of Nephroblastoma (Wilms' tumor, WT) in 11 South-Eastern European (SEE) countries, comprising an informal network including the Nationwide Registry for Childhood Hematological Malignancies and Solid Tumors (NARECHEM-ST) in Greece and compare their figures to those derived from SEER, US.

Methods SEE Cancer Registries yielded 1723 childhood (0-14 years) WT cases eligible for the survival analyses registered during the periods ~1990-2016, whereas 2898 are eligible by SEER (2243 during 1990-2012). Survival rates were analyzed using Kaplan-Meier curves and Cox Proportional Hazards models.).

Results Most unfavorable survival rates were noted among children aged 10-14 years and the risk almost doubled among patients residing at diagnosis in rural areas. Although the 5-year survival rates range widely (50-100%, 87% in Greece) within SEE; overall, worse outcomes (81%) are noted in SEE compared to those of SEER (92%, 95%CI:91-94%) with an almost 2-fold higher hazard ratio for most of the SEE countries reaching an ~6-fold for Ukraine.

Discussion/conclusion Considerably less favorable WT survival rates were found for children in SEE countries compared to those in the States as well as to those reported from North-Western Europe (5-year survival rate 93%) in the SIOP-Renal Tumor Study Group. In addition, despite the within SEE variation, worse is survival for children residing at diagnosis in rural areas pointing to strong socioeconomic differentials for this type of childhood cancer despite recent therapeutic improvements.

APC-64

PREDICTORS OF SURVIVAL FOR CHILDHOOD NEUROBLASTOMA IN SOUTH-EASTERN EUROPEAN COUNTRIES AND US: USING REGISTRATION DATA

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Background Neuroblastoma (NB) is the most common solid tumour in the first year of life. Significant survival gains have been overall experienced due to novel treatments, albeit persistent socioeconomic differentials in health care delivery may be plausible. We aimed to assess survival and associated prognostic factors for childhood neuroblastoma in South-Eastern Europe (SEE) in comparison to the USA.

Methods Primary data from 13 SEE cancer registries and SEER were used. Survival per registry and overall in SEE and SEER was calculated for the total available registration period and for the last 10 and 5 years. Kaplan-Meier curves and Cox regression hazard ratios (HR) adjusted for age, gender, country, urbanization (rural/urban place of residence at diagnosis), tumour localization and histological subtype were derived.

Results In total 1828 new cases of NB were registered in SEE (1990-2016) and 3072 in SEER, US (1990-2012). The 5-year overall survival was significantly lower in SEE (59%) compared to SEER (77%) with a wide variation from 45% in Ukraine to 81% in Poland and Greece reaching the second higher survival (75%) very close to that of SEER. Multivariate analysis showed a 4-fold increased hazard in older age diagnosis compared to infants; additionally, male gender, CNS/abdominal primary location and rural residence were predictors of worse outcome, whereas ganglioneuroblastoma subtype was associated with significantly better survival.

Discussion/conclusion The significantly worse prognosis of childhood NB in SEE countries in comparison to the US, as well as among those living in rural areas underscore an adverse role of socio-economic factors and deficient health care systems performance. In view of advances in our understanding of disease biology, collection of basic data in childhood cancer registries, needs to be complimented with clinical and genetic information as well as treatment details as to allow identification of modifiable factors affecting survival.





APC-65

CONDITIONAL SURVIVAL OF BREAST CANCER SURVIVORS IN KOREA

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Background Conditional relative survival (RS) could provide more relevant information than standard 5-year survival, which may be pessimistic because many patients with unfavorable prognosis die shortly after diagnosis. This study aimed to estimate conditional 5-year RS of breast cancer survivors in Korea.

Methods Breast cancer incidence data from 1999 to 2013 were obtained from the Korea National Cancer Incidence Database, and mortality data of breast cancer patients were acquired from Statistics Korea. Conditional 5-year RS for each age group was computed for every additional year survived up to 10 years. Period analysis with follow-up period 2009 to 2013 was used.

Results A total of 184,481 patients were diagnosed as breast cancer and 28,616 patients (15.5%) among them died between 1993 and 2013. Five-year RS at diagnosis was 91.5% and 10-year RS 85.8%. Conditional 5-year RSs were 91.3%, 93.7%, and 95.1% at 1-, 5-, and 10-year after diagnosis, respectively. By age groups, conditional 5-year RS after survival 5 years varied from 91.3% to 95.2% and conditional 5-year RS after 10 years surviving exceeded 93% for all age groups. There was no excess mortality since 5 years after diagnosis for age group 40-49 years, and since 8 years after diagnosis for 50-59 years.

Conclusion This study showed that the prognosis of breast cancer survivors in Korea has been improved according to time after diagnosis and age. Conditional RS provides clinically relevant information, and it could help breast cancer survivors plan their future and oncologist plan surveillance schedules.

APC-66

THE COST OF LOST PRODUCTIVITY DUE TO PREMATURE CANCER-RELATED MORTALITY IN RUSSIA: RECENT TRENDS AND PROJECTIONS 2001-2030

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Background Costs of lost productivity due to premature cancer-related mortality may be utilized in cost-effectiveness analysis and help prioritize cancer control activities. Despite different methods for quantification, it is the way to communicate cancer registry data. The aim of this study was to quantify and project productivity costs due to cancer-related mortality in Russia 2001-2030.

Materials and Methods Cancer mortality data (2001-2015) were acquired from the State Cancer Registry, population data, labor force participation rates and annual earnings were retrieved from the Federal State Statistics Service. Cancer mortality was projected till 2030 with Nordpred. The human capital approach was applied to estimate productivity losses in 2001-2030 with an annual discount rate of 2.5%. GDP growth, discount rates, and projections uncertainty were addressed in the sensitivity analysis.

Results The total annual cost of lost productivity was \$6.5 billion in 2001-2005 (1.3% of GDP), peaked at \$8.2 billion in 2006-2010 (0.41% of GDP) and was predicted to drop to \$7.6 billion in 2026-2030. Female/male ratios of overall costs were 0.64-0.68. Lung (\$1.2 billion max. annual) and stomach (\$0.6 billion) cancer in men and breast (\$0.7 billion) in women accounted for substantial proportion of costs. However, lip, oral and pharynx (combined) cancer mortality costs showed maximum predicted growth (\$0.22 billion), followed by cervical (\$0.2 billion), colorectal (\$0.15 billion) cancer. Maximum costs per death were for bone, soft tissues, brain and cervical cancer. The costs per cervical cancer death showed maximum absolute growth (from \$34 400 to \$64 800) compared to other cancer types.

Conclusion Lung cancer in men and breast cancer in women remain the main reason for mortality related loss of productivity in Russia. Cervical and oropharyngeal cancer showed substantial growth of costs, underlining new challenges for cancer control in Russia.

Analysing, presenting and communicating cancer registry data

APC-67

CANCER INCIDENCE IN FIVE CONTINENTS (CI5)
VOL. XI

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Background Cancer Incidence in Five Continents (CI5) has long been recognized as the global reference source of high quality national or subnational cancer incidence data.

Methods The production of CI5 Volume XI of (CI5-XI) commenced in collaboration with the IACR in 2015 with the formation of an international Editorial Board. Following a general invitation to all population-based cancer registries to submit data, responses were received from 474 registries, providing datasets covering 632 populations. These data were reviewed by the Editorial Board during seven face-to-face meetings in Lyon, France. In evaluating registered cases, three dimensions of quality were assessed to ensure that registry submissions meet a sufficiently high standard for inclusion.

Results Comparability is the extent to which a registry's coding and classification procedures and definitions adhere to established international standards and guidelines. The definition of an incident case is especially important in evaluating comparability.

Completeness is the degree to which all diagnosed neoplasms within a registry's catchment population are included in the registry database. Several methods can be used to evaluate the level of completeness of the enumeration of cases within a catchment population.

Validity (or accuracy) is the proportion of cases recorded as having a given characteristic that truly do have that attribute. Several indicators of validity relate to the precision of a registry's source documents and the level of expertise in abstracting, coding, and recoding cases.

Conclusions The preparation and evaluation of the quality indices requires careful attention from the Editors to ensure that all accepted datasets are of sufficiently high quality to merit inclusion in the Volume. The data processing and the procedures used to conduct a transparent and impartial evaluation of each submitted dataset are presented in this poster.

APC-68

INCIDENCE TRENDS OF SKIN CANCER: DATA OF
ARACAJU CANCER REGISTRY

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Background Skin cancers are the most incident malignancies in the world. Incidence is reported to be increasing, mainly due to non-melanoma cases, also called keratinocytic cancer. Cancer registries often collect data about them irregularly because of the various reasons of underreporting. Incidence data are therefore underestimated. We aim to present incidence rates and trends of melanoma and non-melanoma skin cancer in a mid-sized Brazilian population and hope to contribute with policy-makers to control strategies.

Methods We calculated age-standardized rates (ASR) by the direct method, world population, for the 1996-2012-time series of the Aracaju Cancer Registry. Then, we calculated incidence trends using the Joinpoint Regression Program.

Results Of the total of 11.733 cases of skin cancer collected in the period of study, 5806 were in men and 5927 in women. The histologic subtypes were: 82.9% basal cell carcinoma, 14.2% squamous cell carcinoma, 1.9% melanoma and 0.9% of other histologic subtypes in men; In women, the percentages were 87.0%, 9.7%, 2.5%, and 0.9%. Average ASR were 228.6 (95%CI: 221.6; 235.6)/100,000 men, and 145.4 (95%CI: 141.0; 149.9)/100,000 women for non-melanoma skin cancers; for melanoma, the ASR were 3.9 (3.2; 4.6)/100,000 men and 3.5 (2.9; 4.1)/100,000 women. The Incidence trends showed mostly upward trends in the first years of the series for non-melanoma cases and then stabilized. For melanoma, trends were stable.

Discussion/Conclusion The Aracaju Cancer Registry has achieved good case ascertainment. Although, the underreporting of skin cancer cases, due to removal of lesions without histopathologic confirmation, decisions to watch skin lesions, instead of excising them, and deferring medical examination, are potential pitfalls of the study. Age-standardized incidence rates of non-melanoma skin cancer were high in the period of study, trends demonstrated stabilization over the most recent years of the time series. For melanoma, trends showed an upward but non-significant pattern.





APC-69

GICR CAPACITY BUILDING IN LATIN AMERICA – FIRST STEPS FOR A MENTORSHIP PROGRAM

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Purpose The Global Initiative for Cancer Registry Development (GICR) coordinated by the International Agency for Research on Cancer (IARC) established the IARC Hub for Latin America (IARC-LA Hub) in 2014. Training is one of the central GICR activities, with mentorship being a wide-spread training modality among population-based cancer registries (PBCR). The IARC LA Hub and its collaborating centres started mentoring activities that will be helpful to set up an organized program.

Methods As a first step we identified through a questionnaire sent to 22 high quality (HQ) PBCR in the region, those that were willing to receive persons from less developed PBCR. 9 registries in Argentina, Brazil, Colombia, Cuba, Ecuador, Martinica and Uruguay expressed their willingness to receive mentees during a time range from 2-12 weeks. We developed a pre-mentorship questionnaire, and two final evaluation formats (one regarding knowledge accomplishment and one general satisfaction on the mentorship programme).

Results From January 2016 to June 2017, seven mentees (from Cuba, Guatemala, El Salvador, Panama and Paraguay) have been hosted (2-4 weeks) at the PBCR of Mendoza and Uruguay and two more from El Salvador and Honduras are planned for 2017. These activities were mainly funded by GICR. In addition, Mexico applied a “reverse mentoring” with experts from two HQ Colombian PBCR visiting (one week) two less developed registries. GICR helped coordinating these activities, that were paid by Mexico.

Conclusion The mentoring program has had a successful onset providing targeted training for population-based cancer registries in the LA region. Trainees have expressed a high satisfaction and attainment of learning objectives while more registries are interested. Mechanisms for sustained funding as well as different funding modalities need to be considered, including planning of mentorship stays by registries and countries themselves.

APC-70

GLOBAL CANCER OBSERVATORY: FUTURE PERSPECTIVES

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Background The Global Cancer Observatory (GCO) was launched in May 2016 as the gateway to presenting global and national cancer statistics at IARC to inform cancer control and research, via an interactive web-based platform. The online tools focus on the visualization of cancer indicators to illustrate the changing scale, epidemiological profile, and impact of the disease worldwide, using data from several key projects of IARC’s Section of Cancer Surveillance (CSU), including GLOBOCAN, Cancer Incidence in Five Continents (CI5). It includes an innovative and user-friendly interface that provides timely information on a broad range of instructive indicators.

Methods GCO embraces the ever-growing demand for data visualisation tools that illustrate the current and evolving global cancer burden. The user is routed to one of four subsites: Cancer Today – national estimates for the latest year; Cancer Over Time – incidence trends based on CI5 data and mortality trends based on WHO mortality data; Cancer Tomorrow – future cancer predictions, and Cancer Causes – population attributable fraction (PAF) of major risk factors for common cancers.

Results Work is ongoing to complete the GCO as well as enhance the existing facilities within each subsite: Cancer Today has incorporated new visualizations, Cancer Causes has added global PAF statistics for key risk factors. Other subsites are under construction: Cancer Over Time will illustrate temporal trends at the national level using national or subnational (aggregated to national) data 1960-2015. Cancer Tomorrow will explore the future cancer burden up to 2040 based on demographic- and trends-based projections, as well as specific scenarios.

Conclusion A major focus is the continued enhancements of the GCO to make it more interactive, user-friendly and informative. Inclusion of a suite of indicators and the production of definitive graphics – that can be easily modified and reproduced – will ensure GCO becomes the definitive one-stop system for global cancer data.

Analysing, presenting and communicating cancer registry data

APC-71

INCREASING TRENDS OF THYROID CANCER, REAL OR OVERDIAGNOSIS?

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Background Thyroid cancer incidence has been increasing due to detection of small papillary lesions. Whether this a true rise in incidence or only a result of screening and diagnosing indolent tumors has been debated. In addition, mortality trends have been stable. Our purpose is compare incidence and mortality trends and provide data for control policies.

Methods Age-standardized rates were calculated by the direct method, world population, for the 1996-2012-time series of the Aracaju cancer Registry; and then incidence and mortality trends were determined using the Joinpoint Regression Program.

Results A total of 1,008 cases of thyroid cancer was diagnosed in women in the period of 1996 and 2012. Mean age-standardized rates (ASR) for the period 1996-2013 were 11.1/100,000 women, and for the period 2005-2012 30.2/100,000 women. Incidence trends calculations demonstrated upward curves: annual percent change (APC) of 11.1 (CI95% 8.6; 13.7) for ASR; APC of 9.5 (CI95% 6.0; 13.1) for age group 20-44; APC of 12.2 (CI95% 8.1; 16.5) for age group 45-64; APC of 7.8 (CI95% 3.0; 12.8) for age group 65+. The Joinpoint Regression Program did not calculate mortality trends because there were many years with 0 cases, and rates maintained low.

Discussion/conclusion Data of the 1996-2012-series of the Aracaju Cancer Registry showed incidence trends with APC of 11.1% annually and very low mortality rates throughout the study period. These findings might be consistent with overdiagnosis and police-makers should be aware before determine control strategies.

APC-72

COMPARISON OF LEUKEMIA AND LYMPHOMA INCIDENCE AND MORTALITY AGE-SPECIFIC RATES IN RUSSIA AND NORDIC COUNTRIES IN 2014

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Background Hematological malignancies account for 4,8% of new cancer diagnoses in Russia. We compare age-specific rates of Hodgkin lymphoma (HL), non-Hodgkin lymphoma (NHL) and leukemia incidence and mortality in Russia and in Nordic countries.

Materials and methods Number of registered cancer cases and deaths in sex and age groups in 2014 was taken from the State Cancer Registry (nation-wide data) for Russia and from NORDCAN database for Nordic countries. Age-standardized rate (ASRs) per 100 000, age-specific rates per 100 000 were compared.

Results In women the incidence ASRs per 100 000 of HL, NHL and leukemia was higher in Nordic countries (2,1; 5,57; 7,37 per 100 000 in Russia vs 2,2; 17,4; 10,6 in Nordic countries). HL mortality was higher in Russia, but NHL and leukemia mortality was higher in Nordic countries (0,55; 2,52; 4,67 in Russia vs 0,3; 6,1; 6,4 in Nordic countries). Similar results were in men: in Russia the incidence of HL, NHL and leukemia was 2,22; 5,84; 8,3 and 2,9; 21,1; 14,5 in Nordic countries. Mortality was 0,79; 3,08; 5,41 vs 0,5; 7,6; 8,1, respectively. The rates in older age-groups were higher in Nordic countries, compared with younger age-groups. For example in 30-34 years old men in Russia incidence rates were 2,41; 2,56; 2,02 compared with 3,2; 3,7; 3,3 in Nordic countries. In 60-64 years old men incidence rates were 2,54; 15,30; 20,20 vs 2,92; 39,23; 23,87, respectively. Similar results were for mortality rates and also female rates. Absolute and relative difference was remarkably higher in NHL than in HL and leukemia.

Conclusion There is a need for high-quality data and improvements in the accuracy of NHL, HL and leukemia registration in Russia. Careful monitoring of rates remains a priority to guide cancer control programs, assess survival and control effectiveness of diagnostics and treatment.





APC-73

QUALITY IMPROVEMENT BY ONLINE FEEDBACK FROM THE NETHERLANDS CANCER REGISTRY, NCR ONLINE

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Background Since 1989 the Netherlands cancer registry (NCR), hosted by the Comprehensive Cancer Organisation (IKNL), registers all newly diagnosed malignancies in the Netherlands. Specially trained datamanagers gather data on patient- and tumour characteristics, treatment and follow-up. Feedback to clinicians on performance, guideline adherence and quality of care was given on paper or in static data files on hospital level. Need for modernisation was obvious.

Method A webbased tool, NCRonline, was build. In consultation with clinicians, ratio's to describe quality of care for breast and colorectal cancer were defined.

Results In NCRonline incidence and ratio's can be presented in a flexible way: on hospital level and within clinical cancer networks (CCN). The defined ratio's give insight in the quality of care and support auditing and regional discussions on clinical pathways and best practices. The tool is released in April 2017 and will be stepwise implemented in hospitals and regional CCNs. NCRonline includes ratio's for breast and colorectal cancer. Ratio's for other tumour sites will follow.

Conclusion By linking the NCR to other databases such as hospital discharge data, radiotherapy data, pharmo data, primary care data, screening data or hospital financial data, more ratio's in NCRonline will be developed. Parallel to NCRonline IKNL developed two other tools to support quality of care: ONCOguide and ONCOLinQ. ONCOguide is an app in which guideline recommendations are presented in decision trees. Next step will be the inclusion of prediction models (nomograms) to support clinical decision making. ONCOLinQ is a tool that supports standardisation of the multidisciplinary team discussions by the use of a standardized tumour board report. Recorded data can be directly sent to the NCR. Combination of these three tools will make shared decision making and the monitoring of the quality of care more easy and give a boost to better care.

APC-74

INCIDENCE TRENDS OF LUNG CANCER SUBTYPES IN CZECH NATIONAL CANCER REGISTRY DATA

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Czech National Cancer Registry (CNCR) is a population based cancer registry. Reporting cancer cases to CNCR is obligatory by law. Total incidence of lung cancer in the Czech Republic was 42.3 age standardised rate (world standard) with long-term decline in men and 17.43 with long-term slow increase in women. There were 4172 newly diagnosed cases of lung cancer in men and 2090 new cases in women in 2014.

According to the WHO classification there are four main subtypes of lung cancer based on microscopic validation: small cell carcinoma (SCC), squamous cell carcinoma (SQCC), large cell carcinoma (LCC) and adenocarcinoma. Relevant data for morphological subtype distinction (proper International Classification of Diseases for Oncology ICD-O morphology coding) are available since 1987.

There is a slight long-term decline in incidence of SQCC as major subtype in men with adenocarcinoma becoming the second most common subtype since 2005. Stable number of newly diagnosed cases are of SCC on third and LCC on fourth position.

In women the adenocarcinoma has been the most common morphological subtype since 2006 leaving SQCC on the second position followed by SCC and LCC.

Incidence trends of four main subtypes of has changed during last 30 years of cancer registration possibly following changes in smoking habits in the Czech population.

Analysing, presenting and communicating cancer registry data

APC-75

PROGNOSTIC IMPACT OF TUMOR LOCATION IN COLON CANCER: THE MONITORING OF CANCER INCIDENCE IN JAPAN (MCIJ) PROJECT

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Background Colorectal cancer is one of the most common cancers worldwide. Previous studies reported a significant prognostic impact of tumor site with an increased risk of mortality risk for right-sided compared with left-sided colon cancer (BMC Cancer. 2016). However, it remains unclear whether tumor location itself has a significant prognosis impact. Here, we evaluated 5-year relative survival (RS) of colon cancer by anatomical subsite in the Japanese.

Methods We used population-based cancer registry data from the Monitoring of Cancer Incidence in Japan (MCIJ) project. We analyzed colon cancer cases diagnosed between 2006 and 2008 in 21 population-based cancer registries. The colon sites (C18.0-18.7) were categorized into three groups, right-sided colon (C18.0-18.3), transversal colon (C18.4) and left-sided colon (C18.5-C18.7). The excess mortality model was applied to obtain the excess hazard ratio (EHR) and 95% confidential intervals (CIs) with adjustment for tumor stage, age and sex to assess the impact of location of colon cancer.

Results A total of 62,350 patients were analyzed for this study. RS for patients with right-, transversal- and left-sided colon cancer was 69.2%, 73.8%, 74.5%, respectively. After adjustment with sex, age and stage, compared to right-sided colon cancer, the EHRs for mortality for transversal colon cancer and left sided-colon cancer were 0.94 (95%CI, 0.89-0.99) and 0.79 (95%CI, 0.75-0.82), respectively.

Conclusion Our study found that RS for right-sided colon cancer could be lower than RSs for transversal colon cancer and left sided-colon cancer.

APC-76

VARIATION IN INCIDENCE, SURVIVAL AND MORTALITY TRENDS IN CHILDHOOD LYMPHOMAS IN TWO NEIGHBOURING HIGH-INCOME COUNTRIES: BELGIUM AND THE NETHERLANDS DURING 2005-2014

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Background Population-based information about progress against cancer in terms of trends in incidence, survival and mortality rates is needed for discerning progress. We estimated putative progress against childhood lymphomas diagnosed in Belgium and the Netherlands since 2005.

Methods From the Belgian and Netherlands cancer registries all patients aged 0-17 years (19 years for mortality) with a lymphoma diagnosed up to 2014 were selected. Incidence (using ICCC-3) and mortality rates were directly age standardised to the Segi World Standard Population and linear regression was used to determine the direction and significance of trends. Observed survival was calculated by Kaplan-Meier method and was estimated at 5 years from diagnosis.

Results During 2005-14 incidence rates for ICCC-3 main group II Lymphomas and reticuloendothelial neoplasms were higher for Belgium compared to the Netherlands (WSR 31 vs 22 per million person-years). Incidence of Hodgkin lymphoma (HL) and non-Hodgkin lymphoma NHL (IIa,b & c) was equal in both countries (WSR 23 versus 22 per million person-years) and remained stable in both countries, although incidence rates of HL at age 5-17 were about 20% higher in Belgium. Five year survival rates for HL were equal (98%, SE 3) and slightly higher for NHL in Belgium, 91% (SE:3) versus 87% (SE:3) in the Netherlands. Mortality from lymphomas below the age of 19 did not differ between both countries, although it was not possible to report age-specific data, being very low. A detailed analysis of subtypes and stages of incident cases will be reported.

Discussion Small differences in incidence and survival, and similar trends in mortality from childhood lymphomas were found within two adjacent high-income countries with adequate cancer registries, suggest mainly different inclusion criteria and coding practices.





BD-1

ESTIMATION OF MORTALITY AND POTENTIAL YEAR OF LIFE LOST ATTRIBUTABLE TO CANCER IN INDIA: COMPARISON OF OLD AND MODIFIED PROCEDURE

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Measures of mortality from cancer are clearly important for public health considerations. With regards, it not only shorten the natural lifespan of patients, but also have significant impact on society. Potential year of life lost have been used by medical researchers and has got considerable attention. PYLL represents a population-based mortality indicator of the impact of that disease on society after a diagnosis of individual dying. Moreover, general concept of PYLL may overestimate the PYLL in younger ages and underestimate PYLL in older ages as it consider the age at death either from assumed population or from actual life expectancy in population under study. Using the data from the National Cancer Registry and vital statistics, this study proposed a modified procedure for calculating PYLL taking Competing Risk Approach (CRA) into consideration for major types of cancer. Comparing modified PYLL to old procedure findings shows that the population burden from cancers of the ovary, cervix, mouth, lung and stomach are major burden of cancer to the individual patient. Old procedure underestimates the PYLL in some selected leading cancer sites. Another concept of Average years of life lost also measures the burden to individual patients. Thus, it may be helpful where individuals' needs are relevant, such as palliative care. As well as crude mortality, more subtle and comprehensive calculations of mortality statistics would be useful in debates on research funding and public health issues.

BD-2

HEALTH DISPARITIES IN ORAL CANCER, LUNG CANCER & PROSTATE CANCER AMONG MEN USING GEOGRAPHIC INFORMATION SYSTEM (GIS)

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Background Kerala's capital Thiruvananthapuram has the highest cancer incidence rate in the South India. Most research on treatment disparities in men with oral cancer, lung cancer & prostate cancer has focused mainly on socioeconomic factors. For capturing health disparities, the socioeconomic differences based on where patients live can provide clear idea into barriers to care and help identify areas in which access to care and health resources, are more pronounced.

Materials Thiruvananthapuram Taluk population cancer registry is covering a population of more than 1.15 million under the network of National Cancer Registry Programme of Indian Council of Medical research (ICMR). Here we identify the incidental patterns and geographic disparities of oral cancer, lung cancer & prostate cancer in Thiruvananthapuram Taluk during 2012.

Methods To determine cancer density statistics, the cancer incidence rates of the administrative units were calculated according to local census data and a cancer density map was prepared. The ecological data such as land cover and elevation were combined and compared with the locations of cancer cases produced by address geocoding.

Results The most common cancers (rates per 100,000) among males were lung cancer (CR: 17.0, ASR: 13.9), prostate cancer (CR: 15.8, ASR: 12.9), oral cancer (CR: 15.4, ASR: 12.6). 11.8 % places shows prostate cancer incidence rate ranged 0-20, and 41.6% places shows incidence rate ranged 20-106. 7.9 % places shows lung cancer incidence rate ranged 0-20, and 40.6% places shows incidence rate ranged 20-76. 21.9 % places shows oral cancer incidence rate ranged 0-20, and 38.5% places shows incidence rate ranged 20-70

Conclusions Geographical analysis provides additional information about where disparate groups live and helps decision-makers, public health researchers to identify the environmental risk factors related to cancer and better understand and respond to geographical barriers that contribute to disparities in care.

Cancer registries and 'big data:' the next generation of studies

BD-3

GEOGRAPHICAL VARIATION IN THE REPORTING OF MULTIPLE PRIMARY CANCERS AMONG THE EUROPEAN CANCER REGISTRIES

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Background Multiple primary cancers (MPMT) are defined as a diagnosis of two or more independent primary malignancies in a patient. The objective of this study was to identify possible variability in the reporting of MPMT among the cancer registries (CRs) participating in the European Network of Cancer Registries (ENCR) and the Joint Research Centre (JRC) project, "Incidence and Mortality in Europe".

Methods Data from 40 general CRs covering a period of at least 20 years were included in the analysis. The JRC-ENCR Quality Check Software (QCS) was used to check data internal consistency to identify errors related to topography, morphology and/or behaviour and warnings concerning MPMT. The proportion and the age standardized incidence rate (ASR) of patients with MPMT and their 95% confidence intervals (CI) were obtained and compared before and after checking the data. The analysis was performed for the whole Europe and by European regions defined according to the United Nations.

Results A total of 9,174,729 malignant tumours was analysed. The proportion of patients with MPMT in Europe was 8.92% (8.91-8.94) and the ASR 29.5 x100.000 (29.4-29.6). The highest proportion was reported for the Northern CRs (9.27; CI: 9.23-9.30) and the highest ASR for the Southern CRs (31.9; CI: 31.8-32.1). Errors were found in 0.7% of the cases (range: 1.32% Eastern and 0.10% Southern CRs) and MPMT warnings in 2.61% (range: 6.81% Eastern and 0.35% Southern CRs). After excluding cases with errors and correcting the MPMT inconsistencies, the proportion of patients with MPMT and the ASR decreased in Europe, being 7.85% (7.83-7.87) and 25.3 (25.2-25.4) respectively. The greatest decrease was found among Eastern CRs.

Conclusions The variability in MPMT reporting found among European CRs could be due to, at least partially, differences in data quality. The QCS can contribute to improving the comparability of the results concerning MPMT.

BD-4

THE DIFFUSION OF DIGITAL MAMMOGRAPHY IN THE UNITED STATES, 2001-2014

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This century has witnessed the rapid abandonment of film as a medium for capturing images in favor of digital methods. Mammography for breast cancer screening has been no exception; the first full field digital mammography system was introduced in 2000, and today film mammography is all but obsolete. To date there have been no geographic studies that have examined the diffusion of digital mammography in the United States and the initial disparities in physical access to digital mammography. Using geocoded data on FDA-certified mammography facility locations and the number and types (film vs digital) of screening machines per facility for the contiguous United States from 2001-2014 we were able to visualize the diffusion of the technology nationwide and summarize the innovators, early adopters and laggards. In addition, using drive times from census tracts to mammography facility locations we were able to summarize the changing disparities in physical access to digital mammography during the study period.





BD-5

CHALLENGES AND PROSPECTS OF CANCER REGISTRY IN THE CONTEXT OF NON-COMMUNICABLE DISEASE SURVEILLANCE IN YEMEN: ADEN CANCER REGISTRY AS AN EXAMPLE

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Background There is an increasing burden from noncommunicable diseases (NCDs) including cancer worldwide to be the world's biggest killers. The morbidity and mortality from NCDs are set to further increase over the next few decades to become a developmental problem addressed in the Sustainable Development Goals. Cancer registries are the only disease-specific registries that are in use for NCDs and are therefore of pivotal importance not only in assessing the cancer burden but also in measuring the impact of interventions in cancer prevention and control.

Methods In Yemen, Aden Cancer Registry (ACR) was established in 1997 as the first population based cancer registries (PBCR). In 2006, the Ministry of Public Health and Population announced the establishment of five PBCR with the aim of developing a network of functioning registries.

Results Currently, this is far from being achieved. The present paper aims at providing an overview of the role of cancer registry and its importance in the National Cancer Control Programme with ACR as an example. It also aims to highlight the current status of cancer registry in Yemen with special emphasis on addressing the challenges that hinder having proper functioning registries.

Conclusion Despite the important role that Cancer Registry in Yemen and ACR in particular play; the current status is unsatisfactory. Expansion of the existing networks of cancer registries is required. However, more important than increasing the number of registries is ensuring that they are functioning well, and producing accurate results. Future requirements to fulfill this goal have been pinpointed to achieve substantial improvement in cancer surveillance via the PBCR to play a crucial role in formulating cancer control plans, as well as in monitoring their success as part of NCDs surveillance. **Key Words:** Non Communicable Diseases, Surveillance, Cancer Registry, Cancer Control, Yemen

BD-6

LES CRITÈRES DE PERFORMANCE DU REGISTRE DE LA WILAYA DE TIZI-OUZOU

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En Algérie, plusieurs registres de tumeurs sont ouverts depuis 1993, dont celui de la wilaya d'Alger qui couvre la région du Centre (Alger, Blida et Tizi Ouzou), jusqu'à sa scission en 2003. En effet le registre des tumeurs de la wilaya de Tizi-Ouzou a pris son autonomie depuis 2003 et malgré les efforts consentis par l'équipe du registre, ce dernier se heurte à des difficultés d'ordre matériel se répercutant indirectement sur l'évolution des critères de performance.

Dans cette wilaya, on enregistre un taux d'incidence des tumeurs en augmentation constante allant de 78,96 pcmh en 2003 à 113,41 pcmh en 2011 et à 151,99 pcmh en 2015. Le sex ratio est passé de 1,16 en 2003 à 0,84 en 2011 et à 0,8 en 2015. Les critères de performances sont en constante amélioration ($p < 10^{-6}$). En effet, le taux d'âge indéterminé est passé de 30,52% en 2003 à 7,3% en 2011 (Homme) et de 14,34% en 2003 à 6,1% en 2011 (femme). Le taux de vérification histologique est passé de 75,44% (2003) à 87,25% (2011). Le pourcentage de localisations primitives inconnues est passé de 2,21% (2003) à 3% (2011).

Cancer registries and 'big data:' the next generation of studies

BD-7

STATIN USE AND OVARIAN CANCER SURVIVAL: A POPULATION-BASED STUDY IN BELGIUM

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Background Preclinical in vitro and in vivo evidence suggests that statins could exhibit anticancer properties in ovarian cancer. Similar effects have also been reported in observational studies but results were inconsistent or related to several limitations such as small cohort size or immortal-time bias. This study aimed at investigating, at the Belgian population level, if statin use is associated with improved ovarian cancer survival.

Methods All patients diagnosed with invasive epithelial ovarian cancer in Belgium between 2004 and 2012 were selected from the Belgian Cancer Registry database. Vital status was obtained from the Crossroads Bank for Social Security and ovarian cancer-specific deaths were identified from death certificates provided by the three Belgian regions. Cancer treatments and statin consumption were retrieved from health insurance databases. Cox multiple regression models with time-varying covariate for statin use, were applied to calculate adjusted hazards ratios (HR) and 95% confidence intervals (95%CI) for the association between post-diagnostic exposure to statins and overall or ovarian cancer-specific mortality within three years after diagnosis. Adjustments were done for age at diagnosis, year of diagnosis, comorbidities, cancer stage, and cancer treatments.

Results A series of 4,895 patients with epithelial ovarian cancer met the inclusion criteria. Of these 1,118 (23%) had at least one statin prescription within three years after diagnosis. The post-diagnostic use of statins was associated with a decrease in hazards ratios of ovarian cancer-specific mortality (adjusted HR=0.82, 95%CI: 0.72-0.93, p=0.002). Stronger effects were observed in patients who were also statin users before diagnosis (adjusted HR=0.72, 95%CI: 0.62-0.83, p<0.001) and in patients using simvastatin or rosuvastatin (adjusted HR=0.83, 95%CI: 0.70-0.99, p=0.04 and 0.70, 95%CI: 0.51-0.95, p=0.02, respectively). Similar results were observed in overall mortality analyses.

Discussion/conclusion Results of this large nation-wide cohort of ovarian cancer patients suggest that post-diagnostic use of statins might improve survival.

BD-8

ALGERIAN NETWORK CANCER REGISTRIES: POPULATION COVERED, INCIDENCE CANCER DATA 2015 AND TRENDS

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Background The National Network of Cancer Registries (NNCR) was established in 2015, as part of the 2015-2019 Cancer Plan and the institutionalization of cancer registries. The objective is to improve the coverage of the country by population cancer registries, and to have a comprehensive and validated impact data in Algeria.

Material and method Structural and Strategic Organization of the National Network of Cancer Registries, implementation of 30 new cancer registries, consolidation of 9 existent registries, training of 43 registries coordinators to cancer registration tools Identification of local and regional problems in the implementation of cancer registries, formalization of a regional and national coordination the National Network of Cancer Registries (NNCR), periodic evaluation of the registration activities, local and national publication of incidence data, feedback and diffusion of validated national incidence data.

Results The national coverage rate for Cancer registration is 82% of the Algerian population, with a coverage rate of 52% of validated registries in 1/01/2015.

The national estimate of the number of cases during the year 2014 is 41,870 cases (16,748 men and 25,122 women). The total gross rate (TB) is 106 / 100,000 (h), and the standardized rate (TS) is 114.5 / 100,000 h. TB and TS in humans are respectively 100.2 and 109.2 / 100 000 h. In the woman are respectively 111.8

and 119.8 / 100,000 h. In men the most common cancers are cancers of the lung, colon-rectum, bladder, prostate, stomach, naso pharynx, NHL, larynx and leukemia's.

In women, breast cancers followed by colorectal, cervical, thyroid, NHL, stomach, biliary and leukemia cancers.

Conclusion The establishment of the National Network of Cancer Registries NNCR enabled us to cover more than half of the Algerian population, and to have comprehensive, national and validated cancer incidence data needed for research and control Against cancer.





CS-1

CANCER-RELATED HOSPITALISATIONS AND “UNKNOWN” STAGE PROSTATE CANCER: A POPULATION-BASED RECORD LINKAGE STUDY

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Background To identify possible explanations for why stage at diagnosis was recorded as “unknown” for prostate cancer cases in an Australian population-based cancer registry.

Methods NSW Cancer Registry (NSWCR) records for prostate cancer cases diagnosed in 2001–2009 were linked to the NSW Admitted Patient Data Collection (APDC) for 2000–2010. All patients in this study had a minimum of 12 months follow-up in the hospital episode records after their date of diagnosis as recorded by the NSWCR. We examined the hospital services received up to one year after diagnosis and used multivariable logistic regression to examine factors associated with “unknown” stage.

Results Of 50 597 prostate cancer cases, 39.9% were recorded as having ‘unknown’ stage. Up to 4 months after diagnosis, 77.2% of cases without a hospital-reported cancer diagnosis were recorded as having ‘unknown’ stage. Among those patients with a hospital-reported cancer diagnosis, stage was ‘unknown’ for 7.6% of cases who received a radical prostatectomy (RP) and for 34.0% of cases who had procedures other than RP. In the latter group, the factors that were related to having ‘unknown’ stage were living in disadvantaged areas (adjusted OR [aOR] range: 1.13 to 1.20), attending a private hospital (aOR range: 1.25 to 2.13), having day-only admission for care (aOR=1.23, 95% CI 1.11 to 1.36), or having procedures other than multiple procedures with imaging (eg, biopsy only, aOR range: 1.11 to 1.45).

Conclusions Over half of ‘unknown’ stage prostate cancer cases did not have a hospital-reported prostate cancer diagnosis within the 4 months after initial diagnosis. We identified differences in the likelihood of cases being recorded as ‘unknown’ stage based on socioeconomic status and facility type, which suggests that further investigation of reporting practices in relation to diagnostic and treatment pathways is required.

CS-2

MORTALITY RATE OF PRIMARY LIVER CANCER IN AOMORI PREFECTURE WAS AGGRAVATED BY HIGH INCIDENCE RATE AMONG YOUNG POPULATION

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Background Primary liver cancer (PLC) is one of the infection-related cancers, of which incidence can be prevented by suitable health policies. Age-standardised mortality rate (AMR) of PLC has been decreasing in Japan since 1990s mainly because of anti-hepatitis C virus (HCV) campaigns. Despite this trend, the AMR in Aomori prefecture, in northern Japan, is levelling off. We investigated why the AMR in Aomori prefecture did not decrease.

Methods AMRs of PLC in Japan and Aomori prefecture were obtained from Vital Statistics. Patients of PLC in Aomori prefecture were extracted from Aomori Cancer Registry Database and the age-standardised incidence rate (AIR) were calculated by direct method. Age-specific incidence rates were also calculated. AIR and age-specific incidence rates of Japan were cited from the Monitoring Cancer Incidence in Japan. Attendance and positive rates of HCV screening in Japan and Aomori Prefecture were cited from Report on Regional Public Health Services and Health Promotion Services.

Results The AMRs in Aomori Prefecture were higher than Japan from 2010 or onward, although the AIRs in Aomori prefecture were lower. The age-specific incidence rates of 69 years or younger among males and of 59 years or younger among females in Aomori prefecture were higher than Japan. The age-specific mortality rates of 74 years or younger among males and of 59 years or younger among females in Aomori prefecture were higher than Japan. The attendance and positive rates of HCV screening in Aomori prefecture were lower than Japan.

Discussion High mortality rates of young population aggravated the AMR in Aomori prefecture. The AIR in Aomori prefecture would be higher than Japan in near future because of high incidence rates of the young. To decrease the AMR, improvement of the attendance rate of HCV screening and appropriate ascertainment of individuals with high risk factors are needed.

CS-3

MONITORING OF INCIDENCE AND MORTALITY OF CANCERS AROUND FUKUSHIMA NUCLEAR PLANT ACCIDENT AREA BY USING CANCER REGISTRY DATA

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Background We observed a trend of incidence and mortality of cancers in several prefectures around Fukushima in order to figure out the effect of the nuclear plant accident in 2011.

Methods We calculated incidence rates by prefecture, by site, by sex, and by age-group using population-based cancer registry (PBCR) data between 2003 and 2012, and mortality rates based on vital statistics. In consideration of a refugee from Fukushima, we observed figures in 9 neighborhood prefectures and whole country as a reference. In view of the successive quality improvement of PBCR data, we calculated quality indicators and confirmed the association with the change of the incidence rate.

Results The age standardized incidence rate (ASIR) increased moderately in the whole country from 2003 to 2012. In the prefectures with high quality data including Fukushima, the rates remained unchanged, in contrast, in the other prefectures, it increased until 2007, and subsequently it became on the same level as the national incidence. In Fukushima, the ASIR of cervix and thyroid cancer increased rapidly from 2011 to 2012. The age standardized mortality rates showed a similar tendency in each of all the prefectures. The data quality improvement was remarkable in many prefectures by 2009, and in Fukushima, it occurred in 2011.

Discussion/conclusion The increasing tendency of the ASIR in Fukushima was not observed as a whole except for cervix and thyroid cancer. However it is considered that the data quality improvement and the full screening program are the main factors of the increase. It is also demonstrated by the dispersion of the ASIR by prefecture, and decrease of mortality-incidence ratio.

CS-4

THE BURDEN OF RARE CANCER AMONG ADULTS IN AUSTRIA, 2000-2012

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Background & Introduction Burden of rare cancer is seldom studied, although in Europe rare cancers represent about 22% of all newly diagnosed cancers each year. The aim of this study was to measure the burden of rare cancers among adults in Austria.

Material & 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.





CS-5

PREDICTION OF CANCER INCIDENCE AND CANCER MORTALITY IN AUSTRIA UP TO THE YEAR 2030

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Background & Introduction Age is a very strong determinant of cancer risk and the number and proportion of elderly people will rise. Planning the health-care system needs to assess the impact of changes in population structures and changes in cancer risk on the development of cancer incidence and cancer mortality.

Material & Methods Data of the Austrian National Cancer Registry, the Austrian Causes of Death Statistics and the population forecast by Statistics Austria were used to predict cancer incidence and mortality in Austria up to the year 2030. Estimates concerning cancer incidence and mortality as well as population forecast are based on a bottom-up process.

Results To illustrate the sole impact of demographic ageing on cancer incidence and mortality a status quo model was compiled. The underlying assumption for this model was that age specific incidence and mortality rates will stay constant. As this assumption will not depict a realistic situation a second scenario, the trend model, was calculated using quasi-Poisson-regression. Past trends from observed cancer incidence and mortality were extrapolated, implicitly incorporating changes of risk behavior as well as diagnostic and therapeutic improvements. For female breast cancer a third prediction scenario was established trying to anticipate the impact of the Austrian mammography screening program which started in 2014. Results on cancer incidence and mortality are currently reviewed.

Conclusion For the first time estimates of future trends for cancer incidence and cancer mortality in Austria up to the year 2030 are available on national and regional level. Data comprise 16 tumor sites, analyzed by sex and federal state.

CS-6

STRENGTHENING CANCER REGISTRATION IN THE FORMER SOVIET UNION COUNTRIES

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Background The IARC Regional Hub located in Izmir, Turkey has as its major role, the provision of support to cancer registries in Northern Africa, Central and Western Asia. Registries in central Asia, as well as other former Soviet Union (FSU) countries have a tradition of mandatory collection of cancer patients' data, although cancer registration practices have diverged over time. A major obstacle to participation in international cancer registry projects and training programs in the FSU remain language barriers.

Methods Collaborative efforts between IARC, the Izmir Hub, WHO EURO and the European Network of Cancer Registries (ENCR) have focused on providing technical support, developing materials and delivering tailored training in population-based cancer registration in Russian language. Additional activities have included promoting the use of data, advocating for the cause of cancer registration, and facilitating collaboration and networking between cancer registries.

Results Since 2014, four courses in the Russian language (Astana 2014, Saint Petersburg 2015, Bishkek and Obninsk 2016), and two training visits to Izmir Cancer Registry (Azerbaijan and Kyrgyzstan) have been organized, with more than 100 cancer registry professionals trained. Both the CanReg5 software and the IARC Technical Report "Planning and Developing Population-Based Cancer Registration in LMIC" have been translated into Russian. The "Astana Recommendations" for cancer registries in the FSU were developed at the course in 2014, while site visits have provided tailored advice and recommendations to registries and programme owners in the following countries: Azerbaijan, Belarus Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan.

Discussion and conclusion Reaching out to the Russian-speaking cancer registry community alongside the momentum of increased commitment to cancer surveillance in the FSU countries has resulted in an increased availability of internationally comparable data from the region. Further efforts are needed to empower regional cancer registry networks and integrate newly available data into cancer control programs.

CS-7

ROLE OF CANCER REGISTRY WORKERS IN IMPROVING THE DOCUMENTATION OF CANCER STAGING DATA

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Background Gathering cancer staging data is an important task in many cancer registers. Cancer staging is crucial for epidemiological analyses involving effectiveness of primary prevention programs, screening methods, and oncological treatment outcomes. In the Greater Poland Cancer Registry, the main source of information on cancer staging is the cancer notification form. Additionally, in some cases this information is also gathered by studying medical records and pathology reports. The comparison of cancer staging data on cards sent in by physicians with data verified and entered into the database by cancer registry workers helps assess the role of cancer registry staff in documenting staging data.

Methods The proportion of entries into the register with documented cancer staging filed in by physicians was compared between the cancer registry database for cases diagnosed in 2014 (13,407 records) and cases awaiting verification by the cancer registry team identified in 2016 (12,341 on-line applications). Statistical significance was analysed using the chi-squared test with a P value of <0.05.

Results Analysis of cancer staging data showed a significant difference between information gathered and verified by cancer registry workers and information submitted by doctors, awaiting verification. In the first group, cancer staging data was fully documented in 59,19% of entries, while in the second group only 36,40% of entries were accurately completed. The difference was statistically significant ($p < 0.00001$).

Discussion/conclusion This study has shown that the cancer notification form cannot be the only source of information on cancer staging for the cancer registry, as data provided by the form is less comprehensive compared to staging data provided by the cancer registry team. The work, knowledge and experience of the registry staff, who use various sources of information such as medical records and pathology reports, significantly improve the accuracy and level of documentation of data on cancer staging.

CS-8

VULVAR CANCER IN GERMANY: INCREASE OF INCIDENCE AND CHANGE OF TUMOR-BIOLOGICAL CHARACTERISTICS IN 1974-2013

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Background The incidence of vulvar cancer in Germany is increasing. Moreover, gynecological oncologists reported to observe increasing numbers of women presenting with small tumors. The aim of the presented study is to validate this observation on a population level and to extend available incidence data.

Methods Data from the population-based Saarland Cancer Registry were used and included 1,136 women diagnosed with invasive vulvar cancer (ICD-9 codes: 181.1-181.4, ICD-10 code: C51) between 1974 and 2013. Multiple imputation methodology was used to overcome loss of precision and potential bias resulting from incomplete data. Incidence trends were investigated with regard to age at diagnosis, tumor size and stage, morphology and histopathologic grade.

Results The age standardized incidence of vulvar cancer increased from 1.6 cases per 100,000 women per year in 1974-78 to 7.9 in 2009-13, respectively, representing rises across all ages. Since 1989-93, an almost exclusive increase of the incidence of small tumors ≤ 2 cm in greatest dimension from 1.2 to 6.6 and of squamous cell carcinomas from 1.7 to 7.1 was observed, whereas the number of larger tumors and of other invasive cancers remained rather constant. Patients aged ≥ 75 years generally suffered from more advanced tumors at the time of diagnosis.

Conclusion To the best of our knowledge, an increase of vulvar cancer incidence of a size as observed in this study has not been reported so far for any other European region. Furthermore, the analyses confirmed the observation of increasing numbers of women presenting with small tumors. The results of the age-specific analyses point to both human papillomavirus infection and non-infectious factors as explanations for the observed rise of squamous cell carcinomas.





CS-9

5-YEAR RECURRENCE RATE AND DISEASE-FREE SURVIVAL FOR COLORECTAL CANCER IN CANTON TICINO, SWITZERLAND, 2005-2010

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Background Aim of the study was to assess the recurrence rate (RR) and the disease-free survival (DFS) of colorectal cancers (CRC) after curative surgery in Canton Ticino.

Methods Data were selected from the Ticino Cancer Registry database. We considered non-metastatic CRC (Mo, stage AJCC 7th ed. I-III) diagnosed in Ticino during the period 2005-2010 and undergoing curative surgery within 6 months from the incidence date with free margins (R0). Follow-up was at 31.12.2016. We considered local recurrence (neoplasm arising in the same localization according to the fourth digit subsite of ICD-O-3 classification) and lymph node/distant metastasis. 5-year RR and DFS probability were analysed for colon and rectum.

Results 919 CRC diagnosed during 2005-2010 were included in the analysis. 170 patients (18.5%; CI95%:16.0%;21.0%) experienced local recurrence or lymph node/distant metastasis, while the remaining 749 patients (81.5%; CI95%:79.0%;84.0%) were disease-free 5 year after surgery. The 5-year DFS probability was 79.6%; factors influencing significantly the DFS probability were stage ($p < 0.0001$) and tumour localization ($p = 0.0032$).

Discussion/conclusion Our results were compared with the available literature data, confirming the risk factors associated with the increased risk of recurrence. Cancer recurrence strongly impacts on patients' quality of life and it is related to quality of care, representing an indicator to be observed at population-based level with more specific analysis, for example in function of patients' characteristics.

CS-10

RESIDENCE IN PROXIMITY OF A COAL-OIL-FIRED THERMAL POWER PLANT AND RISK OF LUNG AND BLADDER CANCER IN NORTH-EASTERN ITALY. A POPULATION-BASED STUDY, 1995-2009

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We assessed lung and bladder cancer risk in people living near a coal-oil-fired thermal power plant in an area of north-eastern Italy covered by a population-based cancer registry. Incidence rate ratios (IRR) by sex, age, and histology were computed according to tertiles of residential exposure to benzene, nitrogen dioxide (NO₂), particulate matter (PM₁₀), and sulfur dioxide (SO₂) among 1076 incident cases of lung and 650 cases of bladder cancers. In men of all ages and in women under 75 years of age, no significant associations were observed. Conversely, in women aged = 75 years significantly increased risks of lung and bladder cancer were related to high exposure to benzene (IRR for highest vs. lowest tertile: 2.00 for lung cancer and 1.94 for bladder cancer) and NO₂ (IRR: 1.72 for lung cancer; and 1.94 for bladder cancer). In these women, a 1.71-fold higher risk of lung cancer was also related to high exposure to SO₂. The findings of this descriptive study indicate that air pollution may have a role with regard to the risk of lung and bladder cancers, limited to women aged = 75 years. Such increased risk warrants further analytical investigations.

CS-11

HIGH NEUTROPHIL-TO-LYMPHCYTE RATIO PREDICTS WORSE OVERALL SURVIVAL IN PATIENTS WITH ADVANCED / METASTATIC UROTHELIAL BLADDER CANCER

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Background An elevated neutrophil-to-lymphocyte ratio (NLR) has been associated with adverse outcomes in patients with bladder cancer undergoing radical cystectomy. However, its role in prognosticating metastatic bladder cancer has not been validated. We aim to study the role of NLR in predicting survival outcomes for patients with advanced bladder cancer.

Methods We retrospectively reviewed 150 patients diagnosed with advanced or metastatic bladder cancer between January 2004 to June 2014. NLR was computed upon diagnosis and after first cycle of chemotherapy. A NLR cut-off of 3.0 was determined, with a concordance index of 0.89. Kaplan-Meier curves, log-rank tests, cox proportional hazards and logistic regression models were used to predict NLR association with survival outcomes.

Results Only 5 patients were alive at end of study; the rest died from metastatic bladder cancer. On multivariate analyses, higher ECOG status, extensive lymphadenopathy, visceral metastases and $NLR = 3.0$ were associated with poorer overall survival [Hazard ratio (HR) 1.67 $P = 0.03$; HR 1.97 $P = <0.01$; HR 2.02 $P = <0.01$; HR 5.06 $P = <0.01$] while chemotherapy confers better overall survival [HR 0.546, $P = 0.01$]. Moreover, the role of chemotherapy prolonged survival longer in patients with $NLR < 3.0$ [Median OS 13.0 vs 19.5 months HR 0.273 $P = 0.008$] compared to $NLR = 3.0$ [Median OS 4.0 vs 7.0 months HR 0.452 $P = 0.020$]. More importantly, when dichotomized to the 4 different pre- and post-chemotherapy groups, patients with pre- and post-chemo $NLR < 3.0$ have the best additional median overall survival of 15.0 months compared to patients with pre- and post-chemo $NLR = 3.0$ (3.0 months).

Conclusion Elevated NLR is independently associated with poorer chemotherapeutic response and overall survival in patients with advanced or metastatic bladder cancer. NLR can be an inexpensive novel factor in prognosticating disease progression and provide better patient counseling.

CS-12

CONDITIONAL SURVIVAL OF PATIENTS DIAGNOSED WITH LUNG CANCER WORLDWIDE: A CONCORD-2 STUDY

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Background Conditional survival of patients with lung cancer has only been studied in a few number of developed countries. This study aimed to provide conditional survival estimates for patients diagnosed with lung cancer worldwide.

Methods This study includes adults diagnosed with lung cancer between 1995 and 2004 in one of 48 countries and followed up until 2009 from CONCORD-2. For clinical use, we computed observed survival for a further five years among patients who had already survived up to three years after diagnosis, by country, sex and age group. For international comparison, net survival at five years after diagnosis was split into one-year net survival up to one year and net survival at the fifth anniversary of diagnosis among patients who had already survived one year. This allowed the distinction between short-term prognosis (survival during the first year) and mid-term prognosis (survival during the second to fifth years).

Results The study included data on 3,118,133 patients provided by 204 cancer registries. The probability of surviving five more years increased with the time elapsed since diagnosis. In France, for example, five-year observed survival for men aged 15-64 years was 15.2% at diagnosis, increasing to 28.6%, 43.9% and 53.8% for men who had already survived one, two or three years, respectively. Five-year net survival conditional on surviving the first year after diagnosis was high in most Asian countries, ranging from 32.0% to 48.1%. Among European countries, one-year net survival ranged widely, from 21.5% to 41.9%, while five-year conditional survival ranged from 27.2% to 46.2%.

Conclusions Thanks to data provided by cancer registries around the world, this study could provide estimates of conditional survival that may be helpful to patients and clinicians worldwide. Comparisons of conditional survival also highlight international differences in lung cancer survival that may help guide improvements to healthcare systems.





CS-13

MALIGNANT NEOPLASMS OF THE RESPIRATORY SYSTEM AND THE IMPACT OF OUTDOOR AIR POLLUTION

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Background Air pollution is among the environmental factors that are classified as carcinogenic. Sufficient evidence exists of the relationship between lung cancer and ambient air pollution. Nevertheless, association of outdoor air pollution (OAP) and the development of other malignant neoplasms (MN) of the respiratory system is negligible. The aim of this study was to explore the relationship of OAP and survival of patients with MN of the respiratory system in the Cretan population.

Methods According to the ICD-10 O, C30-C39 codes were included in the analysis; representing MN of the respiratory and intrathoracic organs. 7,128 relevant cases were obtained from the regional population-based cancer registry of Crete. Data on OAP indicators [PM_{2.5}, between 2.5 µm and 10 µm (PM_{2.5-10}), PM₁₀, PM_{2.5} absorbance (black carbon measure), nitrogen dioxide (NO₂) and nitrogen oxides (NO_x)] were collected using sensors located in 46 geographical sites.

Results The annual median estimates of environmental concentrations were: PM_{2.5}=20.7 (±1.5) µg/m³, PM₁₀=38.9 (±2.5) µg/m³, PM_{2.5-10}=59.6 (±3.7) µg/m³, PM_{2.5} absorbance=1.2 (±0.3)×10⁻⁵ per m, NO₂=15.2 (±3.8) µg/m³ and NO_x=20.1 (±4.9) µg/m³. PM_{2.5}, PM₁₀ and PM_{2.5-10} presented the strongest association with low survival (Correlation Coefficient=0.89; 0.86; 0.81 respectively; p<0.05). The risk of low cancer survival varied significantly (p=0.03) according to the levels of exposure to the OAP among the different types of MN. After adjusting for age, gender and disease stage at diagnosis, MN of bronchus and lung, larynx, nasal cavity and middle ear and trachea presented the highest risk (ranging from b=1.4 to b=3.2; p<0.05) of low survival especially among patients who were smokers (p=0.01) or had other comorbidities (p=0.02).

Discussion/conclusion Study findings could be utilized towards enhancing risk assessment in particular areas of interest. The implementation of targeted interventions is vital to raise public awareness and to initiate actions towards environmental risk assessment and cancer control.

CS-14

THE NECESSITY OF ASSESSING FRAILITY IN OLDER CANCER PATIENTS: ENHANCING CANCER CONTROL

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Background Frailty is a clinical syndrome characterized by diminished strength, reduced endurance, and decreased physiologic function. Cancer disproportionately affects older people and as the elderly population with cancer is growing, frailty becomes a vital component of oncology care. The Cancer Registry of Crete (CRC) recognized the urgency of assessing frailty syndrome in older cancer patients and proposes measures to cancer registries towards enhancing cancer control.

Methods A narrative literature review was performed in PubMed in order to explore and assess the burden and the impact of frailty syndrome in older cancer patients. Secondary objective was to identify and propose recommendations to cancer registries with the aim of enhancing case registration and cancer control. This was achieved by combining the findings of the literature review with the lessons learnt from the CRC's experience.

Results Frailty prevalence in cancer patients varied in most published studies (7%-23%), while it is reported that clinical outcomes are adversely affected in frail and pre-frail patients. According to a recent observational study in an economically vulnerable population group in Crete, 15% of frail individuals had cancer. Furthermore, CRC's pooled data indicated that 12% of the cancer patients in Crete were also diagnosed with frailty, while a significant association between frailty and several clinical adverse outcomes (long-term hospitalization, multiple therapeutic schemes such as chemotherapy and death) was noted (correlation coefficient= 0.84; p=0.01). Additionally, the literature stresses that frailty should be monitored by cancer registries and oncology clinics to enable the identification of the population at risk, predict epidemiological and clinical outcomes and enhance treatment efficacy and decision making.

Discussion/Conclusion There is an urgent need to incorporate frailty assessment in cancer case registration routinely. Implementing frailty screening and management into cancer care may improve certain oncologic patients' clinical outcomes.

CS-15

CANCER INCIDENCE AMONG ADOLESCENTS IN THE UNITED STATES, 2000-2014

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Background Evaluations of cancer incidence among children and adolescents in the US usually focuses on ages 0-14 or 0-19. None have focused on adolescents (15-19) only and cancer is the number one cause of disease-related deaths in this age group. Previous research has discovered that many of the cancers that occur in this age group are biologically different than those seen at other ages. In addition, these patients have different medical, psychological, and social needs than younger and older patients. Purpose: Evaluate distribution of cancer incidence among adolescents—15-19 age group.

Methods A quantitative approach analyzed cancer incidence for this age group using data extracted from the United States Cancer Statistics (USCS) database for diagnosis years 2000-2014 presenting the distribution based on demographic and other factors. A preliminary analysis of the current USCS for 2000-2013 will be updated to include 2014, the most recent cancer data available.

Results The 2000-2013 USCS database includes 63,935 invasive and 7,785 benign brain and central nervous system cases among adolescents in the US. Among the invasive cancer cases, rate ratios (RR) show a statistically significant difference between races, white population has a higher incidence rate (IR) (22.7) than the black (14.6, RR 0.64), American Indian/Alaska Native (12.3, RR 0.54), and Asian/Pacific Islander (15.4, RR 0.68) populations. Non-Hispanic have a statistically significantly higher IR (21.7) compared to Hispanic (19.9, RR 0.92). No statistical differences are seen between urban (22.0) and rural residence (21.8, RR 0.99), though statistically significant differences are found among economic status groups—highest economic status group IR (24.5, RR 1.36) compared to the lowest economic status (18.1).

Conclusions and Impact Cancer-related disparities exist in this age group. Identifying the distinct characteristics of adolescent cancers among the US population is a key step in developing and implementing relevant and targeted public health intervention strategies. Our research findings suggest a need to mitigate the negative effect of adolescent cancers at a critical life stage that can have a lasting impact after the acute stage of the illness has passed. It may further indicate that an age-appropriate approach may minimize the biological disruption of young people with cancer, maximize the chances of adherence to treatment, and return to normal life after recovery. Therefore, focus on survivorship or specific cancers of this age group has significant public health implications.

CS-16

INCIDENCE AND SURVIVAL TRENDS OF CANCERS DIAGNOSED IN ADOLESCENTS AND YOUNG ADULTS (15-39 YEARS)

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Background Cancer among adolescents and young adults (AYAs; 15-39 years old) is rare but its incidence is increasing globally. In The Netherlands, care for AYA cancer patients is mostly dispersed, in contrast to centralized care for all pediatric cancer patients.

Methods Data from all AYAs diagnosed between 1989-2015 (n=93,607) were obtained from The Netherlands Cancer Registry. Age-standardized incidence rates with estimated annual percentage of change and five-year relative survival rates were calculated.

Results Cancer incidence in AYAs increased significantly from 42 to 57 per 100,000 person years in males (1.6%) and from 65 to 80 in females (1.1%).

In both males and females, significant rising incidence trends were found for melanoma (2.2%), skin (2.3%) and thyroid cancer (3.2%), Hodgkin (1.2%) and Non-Hodgkin lymphoma (0.9%). In females, the incidence of breast cancer increased (1.2%), while it decreased for lung (-1.3%) and ovarian cancer (-2.4%). In males, incidence of CML (2.8%) and testicular cancer increased (4.0%). The most common cancers in males were testicular cancer (27%), melanoma (14%), gastrointestinal cancer, Non-Hodgkin and Hodgkin lymphoma (all 8%), whereas in females breast cancer (33%), melanoma (18%), gynecological (15%), thyroid (5%) and gastro-intestinal cancer (4%) were most frequently diagnosed.

Over time, five-year relative survival increased from 72% to 86%. Survival improved for almost all tumor types, except for pediatric tumors: medulloblastoma (~60%) and rhabdomyosarcoma (~41%). A <80% five-year survival was also found for tumors of the lung (37%), gastro-intestinal tract (61%), ALL (69%), AML (64%) and soft tissue sarcomas (77%).

Discussion/conclusions A marked increase in the incidence of a diverse spectrum of hematological and solid malignancies, pediatric and adult-type cancers was found for AYAs. Survival improved over time, however remains poor for certain tumor types. Our data underpin the importance of knowledge of tumors at AYA age to guide centralization of care and clinical research.





CS-17

CHECKING THE VALIDITY ASPECT OF THE QUALITY OF DATA IN A POPULATION-BASED CANCER REGISTRY

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Background Cancer registries collect, store and analyse cancer patient information. The information is collected from various sources to enhance quality of the data as every item relating to the patient is brought together in a single record. Data quality is a property of the information and a product of techniques used to create it. Practical aspects of checking and scrutinizing data quality include; comparability, completeness, validity and timeliness of data. The main objective of this study was to assess the validity aspect of the quality of Eastern Cape Cancer Registry (ECCR) data for two complete five-year periods; 2003-2007 and 2008-2012. Validity/accuracy is defined as the proportion of cases in the registry with a given characteristic that truly have the attribute.

Methods Data were exported from registry database into an excel spreadsheet. Two validity indices; proportion of cases with missing information and percentage of cases with a morphologically verified (MV%) diagnosis were checked. Missing information was checked on the following mandatory variables; name, age, sex, address, cancer site, diagnosis and incidence date.

Results The level of 100% validity of data quality is expected for all the mandatory variables. Most of the mandatory variables had no missing information, except for the address which was incomplete (missing physical address) in 7.6% (n=256) of the cases during 2008-2012 compared to 2.6%, (n=85) during 2003-2007. This proportion of cases with incomplete addresses was acceptable as the patients were from the areas covered by the registry and at least were less than 10%. MV% increased significantly to 83.2% (n=2 936) of total cases during 2008-2012 compared to 67.7% (n=2 173) in 2003-2007.

Conclusion The value of the ECCR rely heavily on the quality of its data. Data of this registry are valid with room for improvement in collecting complete address details of all the cancer patients.

CS-18

COMPARISON OF SURVIVAL AFTER A DIAGNOSIS OF ADULT LEUKEMIA BY SUB-TYPE & COUNTRY, USING CONCORD-2

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Background Adult Leukemia (AL) is a heterogeneous group. The HAEMACARE Working Group showed the importance of analysing separately these haematological malignancies due to differences in term of physiopathology, treatment and prognosis. Worldwide, population-based data are scarce. We propose to compare 5-year net survival by AL subtype, by geographical area, age, sex and calendar period of diagnosis, using the largest population-based cancer registry data base, CONCORD-2.

Methods Adults (= 15 years) with AL diagnosed between 1 January 1995 and 31 December 2009 and followed up to 31 December 2009, will be selected from the CONCORD-2 database. Eight AL subtypes will be defined according to HAEMACARE (Chronic lymphocytic leukaemia, Acute Lymphatic leukaemia, Mature B cell leukaemia, Hairy cell, Acute myeloid Leukaemia, Lymphatic leukaemia NOS, Leukaemia NOS and Myeloid leukaemia NOS), using the ICD-O-3 morphology codes. We will estimate 1- and 5-year net survival using the Pohar-Perme estimator, for each AL subtype by sex, age group (15-44, 45-54, 55-64, 65-74, 75-84 years), calendar period of diagnosis (1995-99, 2000-04, 2005-09) and country. Age-standardised survival will be estimated using the ICSS ponderation.

Results The distribution of AL subtype by country and patients' characteristics might highlight differences in the patterns of subtype distribution. We will compare survival between geographical area and calendar period of diagnosis for each subtype.

Conclusion The first results of CONCORD-2 highlighted wide differences in survival by geographical area for AL as a whole, and a slight improvement over time, varying by countries. Is this trend the same in each AL subtype? A better knowledge of survival disparities for each AL subtype will allow adapting actions in the cancer control worldwide. Survival trends can be used as a surrogate of the change in the care management over time.

CS-19

RARE CANCERS IN SLOVENIA

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Background The experts from the project Surveillance of Rare Cancers in Europe (RARECARE: www.rarecare.eu) defined the rare cancer as any cancer with crude incidence rate less than 6/100,000 inhabitants. Cancer Registry of Republic of Slovenia participated in both international projects on rare cancers: RARECARE (2007-2010) set definition of, published the list of and estimated burden of rare cancers in Europe; RARECAREnet (2012-2015) analysed healthcare pathways and centres of expertise for rare cancers. Our aim was to assess the national burden of rare cancers in the last ten years.

Methods For the period 2004–2013 124,232 incident cases were identified from population-based Slovenian Cancer Registry. According to RARECARE definition for cancer entities, they were classified as rare, common or unclassified. Rare cancers were further divided into 186 entities.

Results All rare cancers combined account for 23.2% of newly diagnosed cancers – annually there were around 2,880 rare cancers (incidence rate 142/100,000) in Slovenia in the period 2004–2013. Although cancer incidence is constantly increasing, the positive trend is mainly attributed to common cancers, while incidence of rare ones remains stable. In comparison to common cancers rare occur more often in childhood (98%) and adolescence (90%). Five-year relative survival of patients with common cancers is lower in Slovenia (55%) compared to RARECARE results (62%). Still, rare cancer patients have similar five-year survival in Slovenia and Europe (47%).

Discussion As in any rare disease also in rare cancers the low incidence is the main obstacle to research of effective treatments. One way to overcome this problem would be to precisely monitor the rare cancer burden on population level and to refer patients to centres of expertise for diagnosis and treatment. This is also one of the goals of the Slovene National Cancer Control Programme 2017-2021.

CS-20

GEOGRAPHIC REGION AS AN AGE-SPECIFIC EFFECT MODIFIER FOR BREAST CANCER INCIDENCE IN PORTUGAL

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Background Female breast cancer incidence rates have been increasing in Portugal for the last decades. To assess regional differences, we conducted the first nationwide breast cancer study.

Methods Invasive breast cancer cases were obtained from four population-based cancer registries for the time-period 1998 through 2011. Corresponding female population estimates were obtained from Statistics Portugal. Analyses were restricted to ages 30 to 84 years and stratified by South, North, Centre, Azores, and Madeira geographic regions. We used the age-period-cohort (APC) framework to complement standard descriptive techniques and to forecast future trends. Age-interactions between regions were assessed through APC fitted age-specific incidence rate ratios (IRR) and Wald tests. An interaction could be qualitative with reversal (i.e., crossing) of the IRR or quantitative (non-crossing).

Results In 48647251 woman-years of observation, there were 71545 breast cancer cases diagnosed at ages 30 to 84 years. South presented the highest age-standardized rate (ASR) (155.8/100,000). North presented the highest annual increase of the ASR (3.6%/year). Quantitative age interactions ($p < 0.05$) were observed between South vs Centre (IRR always > 1), and qualitative age interactions ($p < 0.05$) between North vs South (IRR switched from < 1.0 to > 1.0 around ages 64-66 years). We estimate that from 2014 onwards, North would rank first among all other regions.

Discussion/conclusion Geographic region was an age-specific effect modifier for breast cancer incidence in Portugal. Assuming that Portuguese women share common biological traits and lifestyle/reproductive habits, a potential explanation for the patterns observed may be different screening practices among regions, which could have led to a higher detection rate of more indolent cancers (mainly hormone-receptor positive) in older women, namely in North. Nonetheless, as a reversal of IRR could also point toward disease heterogeneity, future studies should analyze data by tumor sub-type. These results also justify continued monitoring of breast cancer incidence by region.





CS-21

HIGH RESOLUTION STUDIES – AN OPPORTUNITY TO INCREASE DATA QUALITY IN THE GREATER POLAND CANCER REGISTRY

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Background Cancer epidemiology statistics in Poland focus primarily on morbidity and mortality. Although Polish registries gather information on cancer stage at diagnosis, tumour morphology and grading, there is a lack of research concentrating on statistics of this data. The reason for this may stem from low quality of collected data. Greater Poland Cancer Registry (GPCR) collects data both passively and actively. Participation in international research helps improve the quality and comprehensiveness of gathered data, and can strengthen cooperation with clinicians. It encourages the use of new sources of data such as medical records or pathology reports.

Methods TNM staging, tumour morphology and grading data selected for the European High Resolution (HR) study – colorectal cancer (503 cases), and recorded by the GPCR, were compared with data obtained from medical records and pathology reports.

Results The HR - colorectal cancer study examined 503 cases. On initial analysis 236 cases (47%) did not have a defined T, 242 (48%) lacked N, 252 (50%) lacked M staging. The specific morphology code was not recorded in 42 cases (8%), and 280 cases (56%) were undefined in terms of tumour grading. After analysis, the quality and comprehensiveness of the GPCR database significantly increased i.e. the number of records with a defined T increased by 7%, there were 17% more records with a defined N, and 23% more records with a defined M. There was a 1% increase in records with defined tumour morphology and 25% increase in records with defined tumour grading.

Discussion/conclusion This study has shown that participation in international research significantly improves the quality and comprehensiveness of a database. It also encourages participants to further their knowledge on cancer registration and promotes cooperation with clinicians. Another benefit of taking part in international research is the external assessment of data quality by participating institutions. Improving data comprehensiveness opens up the possibility of conducting detailed statistical research on cancer epidemiology.

CS-22

DEMOGRAPHIC AND CLINICOPATHOLOGICAL PROFILE OF PATIENTS WITH THYROID CANCER: A POPULATION-BASED STUDY IN ALGERIA, 1993-2013

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Background In Algeria, thyroid cancer is the fourth most common cancer among females and has been increasing by 6% per year since 2000. We examined the clinicopathological characteristics and the demographics of thyroid cancers in a retrospective population-based cohort of thyroid cancers diagnosed during 1993-2013 in the district of Oran.

Methods The medical records of 1427 thyroid cancer patients, diagnosed and treated from 1993 to 2013 in 43 health institutions were reviewed. Time-trend analysis of demographic, clinical, and pathologic features were performed over four 5-year time periods. Descriptive statistics including mean, standard deviation, and frequency are reported. A p-value <0.05 was considered to indicate statistical significance.

Results The number of thyroid cancer cases increased from 97 during 1993-1997 to 729 during 2008-2013. Women accounted for 88.2% of all patients, and gender distribution did not change significantly with time. The mean age of patients was 44.4±12.9 years (43.8±15.6 and 48.5±13.8 years in women and men respectively). Age at diagnosis increased from 40.2±16.2 to 44.9±15.7 years. Mean size of tumors was 26.8±17.9 mm. Microcarcinomas (tumors ≤10 mm) accounted for 21.3% of all tumors, and this proportion increased from 14.3% to 23.1%, while the proportion of tumors > 40 mm decreased from 22.8% to 13.3%. The proportion of papillary thyroid cancers increased significantly from 40.0% to 69.4% (P < 0.001), while that of the follicular subtype fell from 54.3% to 23.6% (P < 0.001). There was no indication of any other pre-existing disease in 85.3% of thyroid cancer patients, but incidentalomas accounted for only 1.8%.

Conclusions Improved detection does not fully explain the rising incidence of thyroid cancer. Our data suggest that this trend is more likely true. A national thyroid cancer registry is needed and will provide insights on geographic variations of incidence, and foster etiologic research.

CS-23

BREAST AND CERVICAL CANCER INCIDENCE AND MORTALITY TRENDS IN RUSSIA 1980-2013

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Background Breast and cervical cancer are the leading causes of cancer deaths in women in Russia as they are worldwide. The aim of this study is to analyze changes in breast and cervical cancer incidence and mortality trends using data from the Russian National Cancer Registry.

Materials and methods Female breast and cervical incidence and mortality data was acquired from the State Cancer Registry and combined with the data from WHO Mortality Database and the Human Mortality Database. The age-standardized rates of cervical cancer incidence (1993-2013) and mortality (1980-2013) were analyzed using piecewise linear regression to estimate the annual percentage change between breakpoints. Age-period-cohort Poisson models were used to estimate the temporal effects and provide future predictions.

Results Breast and cervical cancer incidence rates uniformly increased over two decades from 33.0 to 47.0 per 100,000 and from 10.6 to 14.2 per 100,000, respectively. Breast cancer mortality rates however declined from 17.6 to 15.7 in 2013, while cervical cancer mortality increased steadily from 5.6 to 6.7 over the same period. Breakpoints of cervical and breast cancer cohort risks occurred in 1937-1953, with a recent decrease in breast cancer mortality risk, but an increase in cervical cancer risks. Cervical cancer has already surpassed breast cancer in number of YLL per death (23.4 vs 18.5 in 2009-2013), and future projections suggest that the YLL per calendar year could reach 1.2 million for cervical cancer and drop to 1.8 million for breast cancer circa 2030.

Conclusion Changes in breast cancer incidence and mortality in Russia are similar to other countries, while cervical cancer rates and specifically, cohort risks, are rapidly increasing. These results underscore the need to prioritize cervical cancer prevention such as HPV vaccination and screening programs.

CS-24

REDUCING THE BURDEN OF LIVER DISEASES IN TAIWAN: AN UPDATE

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Background In the past decades, chronic infection of hepatitis B virus (HBV) and hepatitis C virus (HCV) was endemic in Taiwan, and chronic viral hepatitis may progress to chronic liver diseases (CLD) and hepatocellular carcinoma (HCC). Because the national immunization program since 1984 has successfully reduced the prevalence of chronic HBV carriers, the mortality from CLD and HCC, and the incidence of HCC among immunized birth cohorts. Thus, the national program since 2003 for the therapy of chronic hepatitis B and C among adult birth cohorts who did not receive the HBV immunization needs to be assessed the impact on reduction of liver disease burden.

Methods Profiles of National Cancer Registry and Death Certification Registry were used to derive incidence of HCC and mortality of CLD and HCC from 2000 and updated to 2015. The age-sex-adjusted incidence and mortality of HCC (ICD-O-3 code C220/ ICD-9 code 1550 and 1552) and mortality of CLD (ICD-9 code 571) of adults (30-69 years old) were compared using Poisson regression models before and after the implementation of chronic viral hepatitis therapy program (CVHTP) in 2003.

Results The age-sex-adjusted rate ratio (95% confidence interval, p-value) decreased from 2000-2003 (reference period before therapy program) to 0.70 (0.68-0.72, p<0.001) for CLD mortality, 0.64 (0.62-0.65, p<0.001) for HCC mortality, and 0.76 (0.74-0.77, p<0.001) for HCC incidence in 2012-2015. There was only 3-6 percent reduction in incidence and mortality of HCC and 8 percent reduction in CLD mortality from 2000-2003 to 2004-2007. A more significant reduction in incidence and mortality of end-stage liver diseases (22-31 percent) was observed from 2004-2007 to 2012-2015.

Conclusion CVHTP is effective to reduce the risk of CLD and HCC. It is anticipated that both HBV and HCV in Taiwan may be eliminated to reach the goal set by World Health Organization by 2030.





CS-25

RISK OF CANCERS ASSOCIATED WITH TOBACCO USE IN INDIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background Several studies on cancers associated with tobacco suggested that smokeless and smoking tobacco increases the risk of oral, lung, oropharynx, esophagus, larynx etc. No systematic review has been reported for evidence of consistent studies in India. Therefore, this study undertook a meta-analysis to quantify the overall risk of different cancer sites associated with various forms of tobacco use to investigate the risk variation in each site by different forms of tobacco in a systematic manner.

Methods Analyses were carried out on 45 published studies with reported sample of cases and control among exposed and non-exposed with forms of tobacco. The pooled odds ratios for each cancer by forms of tobacco were calculated using random effects model.

Results A significant association was found for oropharynx (OR=5.26; 95% CI: 2.28-12.14), hypopharynx (OR=3.36; 95% CI: 1.95-5.79), esophagus (OR=2.67; 95% CI: 2.06-3.47), larynx (OR=5.47; 95% CI: 4.01-7.46), lung (OR=5.07; 95% CI: 2.40-10.71) and oral (OR=1.95; 95% CI: 1.51-2.53) cancers among smoker, while among chewer, esophagus (OR=3.46; 95% CI: 2.83-4.22) and oral (OR=6.59; 95% CI: 5.18-8.39) cancer. Among bidi smoker, esophagus (OR=3.63; 95% CI: 2.41-5.45), lung (OR=5.92; 95% CI: 2.67-13.10) and oral (OR=2.85; 95% CI: 1.52-5.36) cancer were significant, whereas lung (OR=2.15; 95% CI: 1.22-3.78) cancer was significantly associated with cigarettes smoking. There was considerable heterogeneity in the pooled odd ratios among all the cancer sites associated with forms of smoking and chewing tobacco.

Conclusion This study clearly indicates that smoking tobacco increases the risk of oropharynx, esophagus, hypopharynx, oral, larynx and lung cancer while chewing tobacco increases the risk of oral and esophagus cancer. The detailed information on quantum of associated additional risk may be incorporated into tobacco prevention and termination efforts particularly among widely prevalent regions in India.

CS-26

IS THERE A DOWN STAGING OF ORAL CANCERS IN INDIA? AN ATTEMPT LOOKING AT THE REPORTS FROM HOSPITAL CANCER REGISTRIES

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Background Oral cancers, among leading cancers in India, accounting for upto one fifth, are preventable and almost completely curable if detected early. The National Cancer Control Programme lays its focus on prevention through health education and early detection. Objective of present study was to examine the down staging of these cancers in India.

Methods Five successive reports of National Cancer Registry Programme during 1984 to 2006 served as the source for obtaining necessary data by clinical extent of disease. Chi-square tests and significance of linear trend in proportions and annual percent changes were worked out to examine quantum of changes in proportions.

Results Down staging (increase in localized and decrease in regional cancers) was observed in Mumbai and Chennai.

Conclusion The changes observed in two metropolitan cities may be attributed to improvement in literacy, awareness about risk factors and symptoms. Results suggest the need for initiation of mass health education and early detection programmes.

CS-27

OUTCOME OF HEALTH CHECKUP CONDUCTED IN RURAL INDIA NEAR A NUCLEAR POWER PLANT INSTALLATION

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Background India is in the midst of an epidemiological and demographic transition with increasing burden of chronic diseases.

Aim The main aim is to collect information on various demographic characteristics, social profile of villagers, household details, occupation, life-style habits, food habits, general health parameters and examination of oral cavity, breast and cervical.

Materials and Methods Health check-up was conducted by Tata Memorial Hospital in a rural area during 2012-2014 in a zonal manner, namely, Zone 1 (0-5kms), Zone 2 (5-10kms) surrounding the Kaiga Nuclear Plant. Data collection: Health camps were conducted in the village covering all households.

Results Of the enumerated 2045 individuals, 1644 participated (80%). The Literacy rate was 68%. Overall among the adults, BMI was 'Normal' for 38.4% individuals. The Tobacco usage was prevalent among 31% population. In the oral cavity screening, 91% were 'Normal' while 9% constituted Leukoplakia (5.2%), Erythroplakia(2%) among others. Compliance rate was 67% for Breast Screening, and 61% Cervical Screening.

In the breast screening, 96% had 'Normal' Breast findings while 81% of Cervix were 'Normal' while 15% were 'Cervical Erosion'.

Among the 469 children, 92% were 'Under-weight'. In all, of 1644 cases, 1 new case of Rectal Cancer was detected and 4 prevalent cancer cases (Breast, Tongue) were observed.

Conclusions Tobacco usage prevalence was higher (40-42%) among this population than that seen Nationally; however the cancer prevalence rate was at par with the national rates. The concern raised by those residing near the NPP installations did not show up in the cancer rates in the initial part of this study.

CS-28

SURVEILLANCE OF CHILDHOOD CANCERS IN INDUSTRIALLY CONTAMINATED SITES IN EUROPE

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Background Children's health represents a public health priority. Globally, 17% (7-42%) of all cancer disease burden in children under five has been attributed to environmental causes. Between the 1980s and 2000s incidence of childhood cancer in age 0-14 years has increased by 13% worldwide, and the increase concerns also Europe. Yet the aetiology of most childhood cancers is still unknown. A principal source of pollution in European contaminated sites is represented by industrial activities.

Methods The Italian Institute of Health (ISS) and the Italian Association of Cancer Registries (AIRTUM) analysed the cancer profile in children and young adults in 23 national priority contaminated sites (NPCSs). NPCSs are mainly located close to industrial areas, either active or dismissed, near incinerators or dumping sites of industrial or hazardous waste.

Results 685 malignant tumours (MT) were recorded among 3,440,240 children aged 0-19 years living in 23 NPCSs from 1996 to 2005. In 15 NPCSs in Centre-Northern Italy, covering 1,754,585 person-years, excess risk of MT was found in the age 0-1 year (37 cases, SIR=1.47, CI90% 1.10-1.93) and of leukaemia in the age 5-9 years (31 cases, SIR=1.45, 1.05-1.95). 393 cases of MT aged 0-19 years, living in 30 Italian NPCSs, were recorded in the period 2006-2013. In the age 0-14 years, these numbers translated in incidence rate of 172 per million.

Conclusion Contaminated areas may increase risk of cancer in children residing in their proximity. To protect child health, these health hazards must be quantified. In a novel project proposal we will aim to evaluate systematically the cancer profile in children living in industrially contaminated sites in Europe. The project will build on the networking activities of the COST Action "Industrially Contaminated Sites and Health Network" (<http://www.icshnet.eu>), and childhood cancer studies coordinated at the International Agency for research on Cancer (IARC).





CS-29

BUILDING THE EUROPEAN CANCER INFORMATION SYSTEM : THE ENCR-JRC PROJECT "INCIDENCE AND MORTALITY IN EUROPE"

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Background The European Network of Cancer Registries (ENCR) and the European Commission's Joint Research Centre (JRC) are coordinating the project on cancer Incidence and Mortality in Europe, launched in June 2015 with the overall aim of estimating the cancer burden in Europe (following the UN definition and including 48 countries). The objective of this study is to assess the participation of the European cancer registries (CRs) in the ENCR-JRC project.

Methods We considered all general population-based CRs (all cancer types and all ages) that are participating in the ENCR-JRC project by submitting data and responding to the data call questionnaire.

Results A total of 126 general CRs from 28 European countries are participating in the project. Of these, only 19 (15%) are national CRs, while the remaining 107 (from 9 different countries) collect data at regional level. In Portugal and the UK the regional CRs include the whole national population. The total number of incident cases collected so far is 31,180,695 (as of June 2017), 94% of these being malignant tumours. Eastern Europe contributed with 11 CRs from 6 countries, representing 20% of incident cases, Northern Europe with 10 CRs from 7 countries and 27% of cases, Southern Europe with 67 CRs from 9 countries and 17% of cases, and Western Europe with 38 CRs from 6 countries and 36% of cases.

Conclusions The CR participation in the ENCR-JRC project can be considered satisfactory. Identification of additional registries and incentives for CRs to participate are pursued, in view of the current and next ENCR-JRC data call. After checking the data quality and sending feedback to each CR, the data are used for estimating the cancer burden in Europe, to be reported in the new European Cancer Information System (ECIS) website.

CS-30

LONG-TERM TRENDS IN INCIDENCE AND SURVIVAL OF PENILE CANCER IN FRANCE

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Tarn Cancer registry, France; Isere cancer registry, France

Objective To determine whether incidence and survival of penile cancer have evolved over time in France.

Methods Data from 1989 to 2011 came from 16 French cancer registries. Age-standardized incidence (ASRW) and net-survival (NS) rates were calculated. Time-trend incidence and survival analysis were confined to the eight registries operating throughout the full period. Log-linear Poisson regression analysis was used to estimate the average annual percent of change (AAPC) in incidence rates. The incidence rate for the most recent period was also calculated from all 16 cancer registries operating in 2009-2011. Human Papilloma Virus (HPV) exposure was deduced from the morphological code. NS was estimated using the Pohar-Perme estimator of the net cumulative rate.

Results No significant change in incidence was observed from 1989 to 2011 (AAPC: 0.08% (95%CI: -1.01%;+1.17%)). The incidence increased with age. The ASRW in 16 registries operating in 2009-2011 was 0.59 per 100,000 (95%CI: 0.50-0.68). The proportion of cases potentially linked to HPV was nearly 11% and did not significantly change over time. NS decreased with age but did not change over time, around 65% at 5 years.

Conclusions Penile cancer remains rare in France but survival is still low. Clinical trials internationally conducted are needed to develop care recommendations with a sufficient level of evidence.

CS-31

IMPROVING CANCER SURVEILLANCE IN THE CARIBBEAN THROUGH THE IARC CARIBBEAN REGIONAL CANCER REGISTRY HUB

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It is well established that high quality population-based cancer registration is pivotal to cancer prevention and control. Not all Caribbean countries have a population-based cancer registry, and quality standards are not uniform across the countries that do have such registries. In addition, gaps in data collection over time are common. Consequently, there is a paucity of information on the burden of cancer and evidence-based decision-making for cancer prevention and control is difficult.

To strengthen cancer surveillance in the Caribbean, the Caribbean Public Health Agency (CARPHA) is collaborating with the International Agency for Research on Cancer (IARC), the US Centers for Disease Control and Prevention (CDC), the U.S. National Cancer Institute (NCI), the North American Association of Central Cancer Registries (NAACCR) and the Pan American Health Organization (PAHO/WHO) to develop and implement the IARC Caribbean Regional Cancer Registry Hub. The Hub aims to strengthen cancer registration by building capacity through technical support, training, networking opportunities and collaborative research.

Over the period January 2015 to June 2017, the Caribbean Hub completed 4 in-country site assessments to document the status of cancer registration and identify areas for improvement. The Hub conducted basic training workshops on the fundamentals of cancer registration for thirteen countries and use of CanReg5 cancer registry software for five countries. Collaborative research initiatives have led to an analysis of leading causes of cancer-related deaths in the Caribbean (Razzaghi, et al., 2016) and other research projects are ongoing. The Hub also completed the evaluation of data quality for two cancer registries in the English-speaking Caribbean, is providing assistance with implementing CanReg5 in one country, and has drafted an operations manual for the Caribbean.

The information and evidence generated through these activities will assist in guiding policy for strengthening cancer registration and for improving prevention and control of cancer in the region.

CS-32

CANCER INCIDENCE AND MORTALITY AMONG YOUNG ADULTS (20-39 YEARS) WORLDWIDE IN 2012

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Background To date, the burden of cancer among young adults has been rarely studied in depth. We describe for the first time the scale and profile of cancer incidence and mortality worldwide among 20-39 year olds, highlighting major patterns by age, development level, and geographic region.

Methods Data from GLOBOCAN 2012 was used to quantify the global burden of cancer in young adults for all cancers combined and 27 major types. The number of new cancer cases and cancer-related deaths were reported alongside corresponding age-standardized rates (ASRs).

Results Nearly 1,000,000 new cancer cases and 400,000 cancer-related deaths occurred worldwide in 2012 among young adults. The burden was disproportionately greater among females and the most common cancer types overall in terms of new cases were breast, cervix uteri, thyroid, leukemia, and colorectum; in terms of deaths, breast cancer, liver cancer, leukemia, and cervical cancer were the main contributors. When assessed by development level and geographic region, the cancer profile varied substantially; generally, the burden for infection-related cancers was greater in regions under transition in terms of both new cases and deaths. Despite incidence in the most industrialized regions (ASR=64.5) being higher than regions under transition (ASR=46.2), the mortality burden was three-times higher in the developing regions, reflecting differences in cancer profiles and poorer outcomes upon diagnosis.

Discussion The global cancer burden among 20-39 year olds is diverse by age at diagnosis, development level, and geographic region. Although the cancer burden is smaller than that observed in older ages, the societal and economic impact remains great as these individuals have a large proportion of their expected lifespans remaining. Targeted interventions, such as vaccination, early detection programs, and effective treatment, are needed in order to decrease the cancer burden in this underserved age group.





CS-33

SOCIOECONOMIC AND DEMOGRAPHIC DISPARITIES IN BREAST CANCER STAGE AT PRESENTATION AND SURVIVAL IN SWITZERLAND

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Background A major goal of health care systems is to improve health equally in all groups of the population. However, socioeconomic and socio-demographic health inequalities in breast cancer (BC) detection and survival have been observed in many countries.

Methods We explored socioeconomic and socio-demographic disparities in BC stage at presentation and survival in female BC patients from population-based cancer registries anonymously linked to the Swiss National Cohort (SNC). Tumour stage was classified according to SEER summary stage (in situ/localized/regional/distant). We used highest education level attained from the SNC to characterize socioeconomic position (SEP) in 3 levels (low/middle/high). Further characteristics included in the analyses were age, living in a canton with organized mammography screening (yes/no), civil status and Swiss nationality. We used ordered logistic regression models to analyse factors associated with BC stage at presentation and competing risk regression models for factors associated with death from BC.

Results Odds of later-stage BC were significantly increased for low SEP (odds ratio (OR) 1.26, 95%CI 1.12-1.41) and middle SEP women (OR 1.11, 95%CI 1.01-1.23) compared to women of high SEP. Further, women living in a canton without organized mammography screening, women diagnosed outside the screening age and non-married women were more often diagnosed at later stages. Women of low SEP experienced an increased risk of dying from BC (sub-hazard ratio 1.28, 95%CI 1.10-1.50) compared to women of high SEP. Notably, these BC-specific survival differences remained after controlling for stage at presentation and/or other sociodemographic factors.

Conclusion It is of concern that these SEP gradients exist in a country with universal health insurance coverage, high health-related expenditures and one of the highest life expectancies in the world. Appropriate intervention strategies are needed to reduce socioeconomic and socio-demographic inequalities in BC stage at presentation and survival.

CS-34

THE IMPACT OF SOCIOECONOMIC POSITION ON STAGE AT DIAGNOSIS AND SURVIVAL IN COLORECTAL CANCER PATIENTS IN SWITZERLAND

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Background International studies, outside Switzerland, have reported socioeconomic inequalities in colorectal cancer (CRC) stage at diagnosis and survival. This study aims to investigate the association between socioeconomic position (SEP) and CRC stage at diagnosis and survival among people living in Switzerland.

Methods This study used population-based CRC data from seven Swiss cantonal cancer registries 2001-2008 (N=10,088) anonymously linked to the Swiss National Cohort (SNC). Follow-up and cause-specific death information was available until the end of 2013. We used education to estimate SEP (low/middle/high). The association between cancer stage at presentation and SEP has been investigated using logistic regressions (UICC stage I versus II-IV). Models included the following covariates: cancer location (colon/rectum), sex, age at diagnosis (30-49/50-64/65-74/75-84 years), civil status (single/married/widowed/divorced), urbanity of residence (urban/peri-urban/rural), language region (German-/French-/Italian-speaking) and nationality (Swiss/non-Swiss). Survival was analysed using competing risk regressions reporting sub-hazard ratios (SHRs) for the risk of dying due to CRC.

Results We observed a social gradient for later stage CRC with adjusted odds ratios (ORs) of 1.05 (95%CI 0.93-1.19) and 1.17 (95%CI 1.01-1.35) for middle and low SEP people. People below 50 years (OR 1.24, 95%CI 1.00-1.53) and above 75 years of age (OR 1.19, 95%CI 1.04-1.35), and single compared to married people (OR 1.29, 95%CI 1.07-1.54) showed elevated risks of being diagnosed at later stages. CRC patients with low SEP (SHR 1.39, 95%CI 1.20-1.60) showed increased hazards of dying due to CRC (SHR 1.13, 95%CI 1.02-1.25). However, after additional adjustment for stage at diagnosis, observed survival inequalities disappeared.

Conclusions In Switzerland, people of low SEP are more likely to be diagnosed at later CRC stages than those of high SEP. In addition, socioeconomic inequalities in survival after CRC diagnosis have been observed. However, survival inequalities could be sufficiently explained by stage at diagnosis arguing against substantial inequalities in CRC treatment.

CS-35

CANCER MORTALITY IN BRAZILIAN REGIONS BY SEX AND RACE/SKIN COLOR

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Background Brazil continues to face the epidemiologic transition and tumours related to life style and infections are simultaneously observed in the country. This work intended to describe mortality patterns by region and race/skin color to identify vulnerable groups and guide future research in racial and regional inequalities.

Methods From the National Mortality Information System (SIM) we extracted deaths occasioned by lung (C34), prostate (C61), stomach (C16), colorectal (C18-19), breast (C50) and cervical (C53) cancers, during 2010. Age-standardized mortality rates (World) by region, sex and race/skin color were calculated using 2010 census data. Death rates ratios were calculated, comparing males and females and whites and non-whites in each one of the 5 Brazilian regions.

Results Mortality from breast, lung and colorectal cancer was higher in the South region compared to those observed in the Southeast, Midwest, North and Northeast. Cervical and stomach cancer mortality was higher in the North compared to other regions. Mortality from cervical, prostate and stomach cancer was higher among non-white compared to whites.

Conclusion The differences observed are probably related to economic and development inequalities between Brazilian regions, with higher mortality of infection-related cancers in regions with lower values of Human Development Index. Moreover, our results reflect inequalities between white and non-white populations across the different regions of the country.

CS-36

BODY MASS INDEX (BMI) AND POSTOPERATIVE COMPLICATIONS, 30-DAY MORTALITY AND LONG-TERM SURVIVAL IN DUTCH PATIENTS WITH COLORECTAL CANCER

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Background To examine the association between BMI and serious postoperative complications, 30-day mortality and overall survival (OS) in colorectal cancer (CRC) patients.

Methods This retrospective cohort study used population-based data from the Netherlands Cancer Registry. All CRC patients diagnosed between 2008-2013 in the south-eastern part of the Netherlands were included. Patients were categorized in four BMI groups: underweight (BMI<18.5), normal weight (18.5=BMI<25), overweight (25=BMI<30), and obese (BMI=30). Logistic and Cox regression models were used to analyze the association between BMI and postoperative complications, 30-day mortality and OS.

Results A total of 7,371 CRC patients were included (underweight: 1.8%; normal weight 41.4%; overweight 40.1%; obese 16.7%). Underweight patients were more likely to have postoperative complications, adjusted OR 1.96, 95%CI 1.09-3.51) and had a worse 30-day mortality, adjusted OR 4.38, 95%CI 2.04-9.44) compared to normal weight patients. After stratification for stage, underweight was associated with a worse 5-year OS in both groups compared to normal weight (Stage I-III: adjusted HR 2.06, 95%CI 1.51-2.80; stage IV adjusted HR 1.65, 95%CI 1.11-2.45). Overweight was in both stage groups associated with an improved 5-year OS compared to normal weight (Stage I-III adjusted HR 0.86, 95%CI 0.77-0.97; stage IV, adjusted HR 0.85, 95%CI 0.75-0.95). Obese patients with stage IV disease were also associated with a better 5-year OS compared to normal weight (adjusted HR 0.76, 95%CI 0.64-0.91).

Conclusion Underweight CRC patients were more likely to have postoperative complications and had a worse 30-day mortality compared to patients in the other BMI categories. The underweight population also had a worse long-term survival while overweight CRC patients and obese stage IV CRC patients were associated with an improved survival compared to normal weight patients.





CS-37

CANCER IN SMALL ISLAND NATIONS: GRENADA AND THE ENGLISH-SPEAKING CARIBBEAN

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Background Grenada is a small island nation of 105,000 in the Caribbean with one single General Hospital and pathology laboratory. This study assesses cancer incidence in the island based on existing pathology reports, and compares the cancer mortality burden between Grenada and other Caribbean nations.

Methods Age-adjusted overall and site-specific cancer "incidence" rates (based on pathology reports) and mortality rates, adjusted for the Segi World Population, were calculated and compared for 2000-2009. Next, mortality rates computed from the WHO mortality data for a more recent period, 2007-2013, were calculated for Grenada and for the remaining English-speaking, majority African-ancestry, Caribbean island nations of more than 100,000 population: Bahamas, Barbados, Jamaica, Saint Lucia, Saint Vincent and Trinidad and Tobago (TnT). Lastly, for direct mortality comparisons by cancer site, age-adjusted mortality rate ratios were computed using negative binomial regression modelling.

Results The pathology reports alone do not suffice to calculate national incidence rates. The leading causes of cancer mortality were prostate and lung cancers among men, and breast and cervical cancers among women. Mortality rates were 170.3 per 100,000 for males and 112.1 in females and significantly higher for Grenadians than their Caribbean counterparts: RR: 1.43 (95% CI 1.32-1.55) and RR: 1.26 (95% CI 1.15-1.38), respectively. Prostate and non-Hodgkin's lymphoma rates are among the highest in the world.

Conclusions Cancer rates are rapidly increasing in Grenada and rates are higher than in larger (Jamaica) and in higher GDP Caribbean countries (Bahamas, Barbados, and TnT). While incidence cannot be compared for lack of cancer registry data, mortality data suggests low microscopic confirmation and low survival, unsurprising given the lack of access to all but the most basic treatment regimens including surgery and some hormone and chemotherapy. Global solutions will be required to meet the cancer control needs of geographically-isolated small nations such as Grenada.

CS-38

CANCER SURVIVAL IN ADULT PATIENTS IN SPAIN

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Background In the context of REDECAN (Spanish Network of Cancer Registries), this work presents cancer survival in adult patients in Spain diagnosed during the period 2000-2007 from Spanish cancer registries participating in the EURO CARE project.

Methods Cancer cases from nine Spanish population-based cancer registries were included and analysed as a whole. All primary malignant neoplasms diagnosed in adult patients were eligible for the analysis. Cases were followed until 31 December 2008. For each type of cancer, 1-, 3- and 5-year observed and relative survival were estimated by sex, age and years from diagnosis. Furthermore, age-standardized 5-year relative survival for the period 2000-2007 has been compared with that of the period 1995-1999.

Results Skin melanoma (84.6 95%CI 83.0-86.2), prostate (84.6% 95%CI 83.6-85.6) and thyroid (84.2% CI 95% 82.0-86.6) cancers showed the highest 5-year relative survival, whereas the worst prognosis was observed in pancreatic (6% 95%CI 5.1-7.0) and oesophageal (9.4% 95%CI 7.9-11.1) cancers. Overall, survival is higher in women. The absolute difference in relative survival between 2000-2007 and 1995-1999 was positive for all cancers as a whole (+4.8% in men, +1.6% in women) and for most types of tumours. Survival increased significantly for chronic myeloid leukaemia, non-Hodgkin's lymphoma and rectum cancer in both sexes, and for acute lymphoid leukaemia, prostate, liver and colon cancers in men and Hodgkin's lymphoma and breast cancer in women. A decline in survival by age was observed in all tumours, being more pronounced for ovarian, corpus uteri, prostate and urinary bladder and less for head and neck and rectum cancers.

Conclusion High variability and differences have been observed in survival among adults in Spain according to the type of cancer diagnosed, from above 84% to below 10%, reflecting high heterogeneity. The differences in prognosis by age, sex and period of diagnosis reveal opportunities for improving cancer care.

CS-39

CANCER REGISTRY BHOPAL: A KEY TO CANCER CONTROL ACTIVITIES IN THE IN THE REGION

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Background Bhopal Cancer Registry was established in the year 1986. The registry operates under the network of National Cancer Registry Programme of India; it registers all the newly diagnosed cancer cases in the resident population of Bhopal. Like any other registry the most important objective for its establishment is that its information recorded and the reports generated should form a scientific basis for planning and organization of cancer control programmes in the region.

Method Based on the registry data trend and survival studies have been carried out on the leading sites of cancer in both sexes.

Results Studies revealed that among females cancer of the breast, cervix, ovary, mouth and gallbladder are the leading sites and contribute to more than 60% of all cancers. Rising trends have been observed for cancer of the breast (APC: 1.36), ovary (APC: 1.4) and mouth (APC: 0.4) while cervical cancer (APC: -1.25) showed a decreasing trend. 5 year relative survival for breast cancer was (49.5%) followed by cervix and ovarian cancers. Among males, cancer of the mouth, tongue, lung, larynx, prostate and hypo pharynx were observed as the leading cause of concern. These cancers accounted to more than 50% of the total male malignancies with age-standardized incidence rates for mouth and tongue cancer ranking among highest in the world. Mouth cancer with (APC: 2.97) and larynx (APC: 2.93) showed a rising trend. Relative 5 year survival rate for mouth cancer was (38%) followed by low survival rate for tongue, lung and larynx cancers.

Conclusion The changing life style and excessive use of tobacco has resulted in increasing incidence of breast, ovary, oral and laryngeal cancers. The alarming situation needs to be addressed with a holistic approach and systematic planning of cancer control activities in the region.

CS-40

NEW FEATURES FOR CANREG5: DATA ENTRY, ANALYSES AND REPORTING

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Background CanReg5 is an open source tool developed and maintained by the International Agency for Research on Cancer (IARC) that registries in low and mid-income countries can adopt as their operation system. It is free, handles multiples sources of data entry, has built-in quality control features including consistency checks and duplicates handling, and allows basic analysis of the data. Building on the open source design of CanReg5, significant improvements were made over the past year. The changes incorporate current technology, third party tools and libraries that have evolved since CanReg5 was released.

Methods New functionality has been developed as previously at IARC, while other features have been designed and implemented in collaboration with external collaborators as part of the GICRNet, a programme to develop regional expertise in specific areas of cancer registration. CanReg5 experts, comprising representatives from the IARC/GICR Hubs in Africa, Asia and Latin America, were involved in the selection of topics, review and beta testing of the new releases.

Results A new data entry form was built to streamline the registration of new cases by presenting information from the three tables – patient, tumour and source – on one screen. In addition, a complete overhaul of the analytical tables was completed by continuing to leverage other free and open source tools, such as R. A key outcome has been to allow a user to generate high-quality graphics for standard reports from a template containing all the most common data visualizations at the click of a button. CanReg5 has also been updated to integrate ICD-O-3 1st revision.

Conclusion Additional functionality has increased the utility of CanReg5. Innovation from the GICRNet trainers, together with their contributions to design, development and implementation, provides a basis for future enhancements and continue to be distributed free of charge to cancer registries worldwide.





CS-41

GLOBAL TRENDS IN SURVIVAL FROM HEPATOCELLULAR CARCINOMA AND CHOLANGIOCARCINOMA 1995-2009: ANALYSIS OF 578,740 PATIENTS FROM 187 POPULATION-BASED REGISTRIES IN 36 COUNTRIES (CONCORD-2)

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Background Primary cancer of the liver is the fifth most common cancer world-wide and the second most common cause of cancer death, with an estimated 782,000 new cases and 746,000 deaths each year. Hepatocellular carcinoma (HCC) accounts for 60-80% of cases and cholangiocarcinoma 10-40%. We present population-based survival estimates for both these types of primary liver cancer in 36 countries.

Methods Individual data were available from 243 population-based cancer registries in 60 countries for 982,857 adults (aged 15-99 years) diagnosed between 1995 and 2009 with a primary, invasive malignant neoplasm of the liver or intrahepatic bile ducts. Analyses were restricted to patients whose primary malignancy had been confirmed by histological or cytological examination. We estimated age-standardised five-year net survival and five-year net survival conditional on surviving one year.

Results Data on 578,740 patients from 187 registries in 36 countries were included in the analyses. The mean survival among the countries during 2004-2009 was 14.8% (range 4.4-23.7%). Age-standardised five-year net survival was generally higher for patients diagnosed with HCC (17.4%, range 7.7-25.5%) than for those with cholangiocarcinoma (8.4%, range 3.7-16.0%). Survival in 2004-2009 was higher in Canada, Italy, Japan, Taiwan and Korea (21.2-23.7%). There was some improvement in survival for all liver cancers combined from 1995-2000 to 2004-2009, most noticeably in younger patients and for patients with HCC.

Discussion The wide global variation in liver cancer survival shows the potential for improved patient outcomes, particularly for HCC. High-resolution studies, including data on stage at diagnosis and treatment, would assist in identifying clinical practices and public health interventions that might improve survival. There is a need to improve the coverage and quality of cancer registration in low- and middle-income countries where liver cancer incidence is high.

CS-42

IS THE GRASS GREENER ON THE OTHER SIDE? A COMPARISON OF CHILDHOOD CANCER INCIDENCE, SURVIVAL AND MORTALITY BETWEEN BELGIUM & THE NETHERLANDS

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Background International comparison of epidemiological measures of cancer burden give insight into differences in registry practices, risk indicators, organization of oncologic care, and treatment regimens between countries. We made a comparison of childhood cancer incidence, 5-year observed survival and mortality between Belgium (BE) and The Netherlands (NL).

Methods All patients aged <18 years and newly diagnosed with cancer (including non-malignant CNS tumors) between 2005 and 2014 were derived from the Belgian and Netherlands Cancer Registry. Cancers were classified according ICC-3. Age was categorised by 0, 1-4, 5-9, 10-14, and 15-17 years. Observed survival was calculated for 2005-2009 and 2010-2014. Follow-up was complete until January 1st, 2017. Mortality data (Coo-C97) for 0-19 years was derived from Statistics Belgium and Statistics Netherlands.

Results In 2016, 2.3 million children <18 years were at risk in BE, in NL 3.4 million. In 2010-2014, about 470 children were diagnosed with cancer in Belgium and about 60 children (<20 years) died each year. In NL, these numbers were 600 new diagnoses and 100 deaths. Age-standardised incidence rate was higher in BE compared to NL (210 versus 182 million person-years in 2010-2014). Overall 5-year survival was also slightly higher in BE (87% versus 83% in NL). However, cancer mortality slightly differed (24 per million in BE, versus 26 in NL). Largest differences in incidence were seen for neuroblastomas (12 per million in BE versus 8.9 in NL). Five-year survival for these patients was 83% in BE and 66% in NL suggesting a larger amount of good prognosis tumors in BE.

Discussion Comparison of these three measures of cancer burden avoids misinterpretations from separate measures and provides a reliable overview of differences between countries. This study shows for example that the higher neuroblastoma incidence and survival (in Belgium) might be affected by screening through a higher use of ultrasound late in pregnancy.

The role and integration of cancer registries in clinical outcomes

CO-1

BEST TREATMENT PRACTICES FOR RESECTABLE GASTRIC CANCER: FILLING CLINICAL TRIAL GAPS USING CANCER REGISTRY DATA

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Background Both adjuvant chemoradiotherapy (CRT) and perioperative chemotherapy (PC) predict improved survival in resectable gastric cancer (GC), however, these treatments have never been formally compared. We sought to evaluate treatment trends and to compare survival outcomes for resected GC patients treated CRT versus PC.

Method California SEER data (2007-2013) were used to identify stage IB-III gastric and gastroesophageal junction adenocarcinoma treated with surgery and either PC or CRT. Mortality hazards ratios (HR) were computed using propensity score weighted and covariate-adjusted Cox regression stratified by clinical lymph node (CN) status.

Results Of 2,146 patients that underwent surgical resection, 1,076 had surgery-only, while 771 and 308 received PC or CRT, respectively. Median overall survival was 25, 33, and 52 months for surgery-only, PC, and CRT patients, respectively; $P < 0.001$, while the percentage of patients receiving PC increased from 17.5% in 2007-2008 to 41.5% in 2013-2014; $P < 0.001$. Patients treated with PC had significantly poorer survival compared to CRT (mortality HR=1.45; 95% CI = 1.22, 1.73). PC was also associated with higher mortality, compared to CRT, when findings were restricted to signet ring histology (HR=1.66; 95% CI=1.21, 2.28) and for all adenocarcinomas showing CN negative status (HR=1.85; 95% CI=1.32, 2.60). Survival did not differ significantly for PC versus CRT in CN positive patients (HR=1.29; 95%CI=0.84, 2.08).

Discussion/Conclusions Surgically resected GC adenocarcinoma patients treated with CRT predicted superior survival, compared with PC, as was survival among CN-negative and signet ring histology GC patients. These findings are particularly relevant given recent adoption of PC for treatment of resectable GC. This research extends the generalizability of clinical trial findings and demonstrates how cancer registry data can be used to supplement findings from clinical trials in discovery of best treatment practices for specific patient subgroups.

CO-2

LONG-TERM SURVIVAL IMPROVEMENT IN OESOPHAGEAL CANCER IN THE NETHERLANDS

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Background Treatment for oesophageal cancer has evolved due to developments including the introduction of neoadjuvant chemoradiotherapy and centralisation of surgery. This study evaluated trends in stage distribution, treatment and survival of oesophageal cancer patients in the last 26 years in the Netherlands.

Methods Patients with oesophageal cancer diagnosed in the period 1989-2014 were selected from the population-based Netherlands Cancer Registry. Patients were divided into two groups: potentially curable (cT1-4a, any cN, cM0-x) and potentially palliative (cT4/4b or cM1). Trends in stage distribution, treatment and relative survival rates were evaluated according to histology.

Results Among all 35,760 patients the percentage of an unknown tumour stage decreased from 36% to 8.2% during the study period, while the percentage of patients with upfront metastatic disease increased from 17% to 34%. Neoadjuvant chemoradiotherapy increased in potentially curable adenocarcinoma (AC) and squamous cell carcinoma (SCC) patients from respectively 4.5% and 2.7% in 2000-2004 to 44% and 28% in 2010-2014. Five-year relative survival increased from 8.3% to 22% for all patients; from 13% to 36% for potentially curable AC and from 11% to 28% for potentially curable SCC over the last 26 years. Median overall survival of potentially palliative patients improved from 20 to 24 weeks.

Conclusions In the Netherlands, survival drastically improved for oesophageal cancer patients, especially in the period 2005-2014. Since the survival of the whole group increased, these findings can only partly be explained by stage migration and might be the result of better treatment related to the introduction of neoadjuvant chemoradiotherapy and centralisation of surgery.





CO-3

'STILL CANCER PATIENT' SELF-IDENTITY IS ASSOCIATED WITH HEALTHCARE USE AMONG CANCER SURVIVORS: A POPULATION-BASED STUDY

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Background As more individuals are now living with cancer as a chronic illness, the concept of cancer identity is gaining attention. Limited research suggest that a self-identity as 'cancer patient' rather than 'cancer survivor' has been associated with depression and lower health-related quality of life, but hardly any research has explored this association with healthcare use. We aimed to investigate the association between cancer identity and healthcare use.

Methods We used data from the population-based CANcEr Survivorship: A multi-Regional (CAESAR+) study, conducted in collaboration between the German Cancer Research Center and six German population-based cancer registries. Survivors of breast, colorectal, and prostate cancers diagnosed in 1994-2004 completed a postal survey on self-identity, disease progression and healthcare use in 2009-2011. We calculated odds ratios (OR) and the 95% confidence interval (CI) of having a patient self-identity. Analyses were adjusted for age, sex, education and cancer stage, where appropriate.

Results Of the 6767 respondents, 16% reported disease progression post-diagnosis. Of these, 62% had a patient self-identity although this perception reduced with time since disease progression. Still receiving cancer treatment or aftercare was associated with patient self-identity (ORadj: 14.2, 95%CI: 12.5-16.2). Cancer-related healthcare use in past 12 months such as visits to the general practitioner (ORadj: 2.3, 95%CI:2.1-2.6) or medical specialists (ORadj: 3.0, 95%CI:2.7-3.5), and hospital visits (acute care: ORadj: 3.5, 95%CI:2.7-4.5; University hospital: ORadj: 3.3, 95%CI:2.1-5.1; rehabilitation hospital: ORadj: 2.2, 95%CI:1.6-3.2) were associated with patient self-identity.

Conclusions A significant proportion of cancer survivors still consider themselves as patients many years after diagnosis and this self-identity is associated with healthcare use. Individuals' self-identity should be considered when exploring their cancer experience.

CO-4

METAMORPHOSE OF TRADITIONAL POPULATION-BASED CANCER REGISTRATION INTO CLINICAL RELEVANCE

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Hamburg Cancer Registry, Germany

Background The Hamburg Cancer Registry (HCR) started population-based cancer registration in the 1920s and acted successfully based on the voluntary right of physicians to notify cases dependent on the patient's informed consent as set by law in 1985. Since 2014 the HCR committed itself to restructuring and expansion for the purpose of a spatially comprehensive and comparable clinical cancer registration covering diagnosis, treatment, course of disease, which is required from all German states by a federal law. Our aim is to assess the current quality of the HCR's database in this respect, to evaluate the results in relation to clinical demands and to describe crucial factors for the transformation process.

Methods Data quality is characterised by completeness of diagnostic and therapeutic information for selected sites and years of diagnosis. Clinician's feedback and evidence-based guidelines are used to assess the oncological relevance of presented data. Factors determining the development of clinical registration are defined with regard to legislation, financing, interests, harmonization and communication between registry and treating doctors.

Results Information on stage, surgery, radiotherapy and chemotherapy improved considerably within three years of clinical ascertainment in Hamburg. The clinical perception of cancer registration depends on data quality and usability in the clinical context and on growing understanding and shared responsibility. The scope of transparent description with regard to oncological care and the calculation of quality indicators derived from evidence-based guidelines is restricted by the availability of required variables in the national dataset and their completeness in the HCR's data stock.

Conclusion The build-up of a meaningful clinical cancer registration depends on a constructive cooperation between treating oncologists and registry which is supported by compulsory requirements.

The role and integration of cancer registries in clinical outcomes

CO-5

A POPULATION-BASED STUDY ON QUALITY OF LIFE IN (VERY) LONG-TERM COLORECTAL CANCER SURVIVORS AND CONTROLS

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Background Previous research suggests an age differential in health-related quality of life (HRQL) among long-term (5-10 years post-diagnosis, LTS) colorectal cancer (CRC) survivors. Few studies have specifically addressed the association of age differentials with HRQL for very long-term CRC survivors (>10 years post-diagnosis, VLTS) and non-cancer controls. We aimed to assess possible deficits in HRQL of CRC-LTS and CRC-VLTS in comparison with age-matched non-cancer controls, and whether the observed pattern varies by age.

Methods We used data from the population-based CAncer Survivorship - A multi-Regional (CAESAR+) study in collaboration with six German epidemiologic cancer registries. Cancer survivors diagnosed in 1994-2004 and aged 20-75 years at diagnosis completed a postal survey in 2009-2011. HRQL from a representative sample of population controls was accessed from the Lebensqualität in DEutschland (LinDE) study conducted in 2013-2014. HRQL was assessed with the European Organization for Research and Treatment of Cancer Quality of Life Core-30 questionnaire. We compared least square means of HRQL scores between CRC survivors and population controls, stratified by age (<65, 65-69, 70-74, 75-79, ≥80) and time since diagnosis. All analyses were adjusted for age, sex, and education, where appropriate.

Results In total, 1016 CRC-LTS, 471 CRC-VLTS and 1680 LinDe respondents were included in the analyses. CRC-LTS <65 years reported poorer HRQL and higher symptom scores when compared with non-cancer controls of the same age strata. CRC-VLTS reported comparable HRQL to non-cancer controls in most age groups. Both CRC-LTS and CRC-VLTS have more complaints of constipation and diarrhea than controls regardless of age. Analyses stratified by sex and cancer site (colon/rectum) showed similar results.

Conclusions Although CRC survivors experience persistent detriments in HRQL many years after diagnosis, these effects are most felt among the younger CRC-LTS.

CO-6

IMPACT OF ADVANCED AGE ON 10-YEAR RELATIVE SURVIVAL IN UPPER GASTROINTESTINAL CANCER SURGERY

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Background Long-term survival of elderly patients after cancer surgery tends to be affected by cancer-unrelated causes of death. Overall survival using all causes of death as events may not represent the actual cancer-specific conditions. Objectives: We aimed to explore the impact of advanced age on 10-year survival in upper gastrointestinal cancer surgery.

Methods We analyzed 665 gastric cancer patients diagnosed from 1996-2000 and 382 esophageal cancer patients diagnosed from 1991-2000 using our hospital-based cancer registry. All patients were followed up for at least 10 years. The excess hazard ratio (EHR) of death from each cancer within 10 years was estimated for elderly patients using the Poisson regression model for relative survival.

Results EHR for advanced age (75 years or more) in gastric cancer surgery adjusted by covariates (stage, residual tumor classification (R), tumor location, postoperative chemotherapy) was 1.53 ($p=0.168$). In esophageal cancer surgery adjusted by covariates (stage, R, postoperative therapy), it was 1.78 ($p=0.062$). Estimation of EHR by categorical data creation of each age revealed that EHR increased significantly when separation was set at the 70s for esophageal cancer patients.

Conclusion Our results indicate that the impact of advanced age differed according to the invasiveness of surgery. Nowadays, many cancer patients survive longer and need to be followed-up for more than five years. Long-term cancer survival figures with the relative survival model considering cancer-unrelated events have become increasingly important.





CO-7

RAPID PROVISION OF CANCER REGISTRY DATA IMPROVES CLINICAL OUTCOMES

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Background Moffitt Cancer Registry is one of the largest hospital registries in the United States, accessioning over 12,000 cases annually. The registry began to participate in the American College of Surgeon's Rapid Quality Reporting System (RQRS) in 2013 to effectively use registry data to monitor and improve upon quality indicators and clinical outcomes. In order to utilize the system's clinical alerts functionality, the registry transitioned to an innovative rapid abstraction model. This multidisciplinary approach also involves physicians of all specialties, process excellence experts, nursing, social work and case management teams, financial and outreach teams.

Methods The registry abstracts cases 4-6 weeks after the patient arrives at the Cancer Center. Weekly meetings with our quality colleagues and case by case review ensure that our physicians in the breast and GI programs are looped in should a patient's timeline not be in accordance with national guidelines for treatment and patient care. Clinical alerts are vital to ensure that the patient's treatment is given in the appropriate timeframe. Patients are fast tracked and navigated throughout the center to ensure their treatments are timely. RQRS allows us to monitor patient's timeframes daily and reach out to the appropriate team.

Results Quality measures were significantly improved upon with the use of registry data and clinical alerts. One example is ensuring that combination chemotherapy is administered within 120 days of diagnosis for women under 70 with T1cNoMo, or Stage II or III hormone receptor negative breast cancer. Original percentage in 2013 was 75.5%. Compliance with this measure is now 96.5%, which is a direct result of Moffitt commitment to providing the highest quality of care to our patients.

Discussion/conclusion Integrating cancer registry data for clinical outcomes is an effective method of improving clinical outcomes. Registries provide robust and comprehensive data sets whereby treatment intervals are monitored closely. In turn this improves treatment timeframes which result in improved clinical outcomes for patients.

CO-8

EPIDEMIOLOGICAL CHARACTERISTICS AND CLINICAL MANAGEMENT OF PATIENTS WITH GASTRIC MALT LYMPHOMA: A POPULATION-BASED STUDY IN FRANCE (FRANCIM NETWORK)

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Background Gastric marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue (GML) is a rare disease whose clinical management has not been well standardized until recently. Our aim was to describe the principal epidemiological characteristics, clinical management, and survival of GML in general French population.

Methods All new cases of GML diagnosed between 2002 and 2010 in 11 French areas covered by cancer registries were included. Pathology reports were verified and if necessary reviewed by an expert pathologist. Age adjusted incidence rate (AAIR) and overall survival were calculated.

Results AAIR of GML was 0.29 per 100,000 person-years (IC95% [0.26-0.32]). Among 416 patients with confirmed GML, 50.2% were males, with median age of 67.5 years. Disease stage was indicated for 338 patients, with 75.7% of stage IE-IIIE and 24.2% of stage IIIIE-IV. 57.3% of 416 confirmed diagnoses were H. pylori (+).

Treatment and survival were analysed in 372 patients. 44 cases were excluded because of histological transformation observed early after diagnosis. Among 205 H. pylori (+) patients, 94.1% received at least 1 line of eradication treatment and 69.4% were in complete remission (CR) from the lymphoma after a median period of 8 months. Among 372 patients studied, 51% received at least one additional treatment (chemotherapy +/-immunotherapy, radiotherapy, surgery). Overall, CR was observed only in 192 patients (51.6%). The 5-year overall survival was 81.9% (IC95% [77.4-85.6]) and we noted a difference between H. pylori (+) and H.pylori (-) (87.5% vs 74.9%; p=2.10-3).

Conclusion In the general population, the diagnosis of GML is not always well documented and often made at more advanced stage as compared to the patients included in clinical studies. There clinical management is heterogeneous. This study underlines the importance of a confirmed diagnosis by a reference pathologist and the implementation of published clinical guidelines in the management of these patients.

The role and integration of cancer registries in clinical outcomes

CO-9

A SYSTEMATIC REVIEW ON THE COLLECTION OF BIOMARKERS FOR BREAST CANCER BY CANCER REGISTRIES.

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Background The European Commission's Joint Research Centre (JRC) in close collaboration with the European Network of Cancer Registries (ENCR) is collecting and harmonising cancer registries' data all over Europe, with the overall aim to set up a European Cancer Information System. In the context of a potential expansion of the data set, the collection of information on biomarker use for breast cancer patients for diagnosis, prognosis, and treatment decisions by cancer registries was investigated.

Methods A systematic review of the available literature on biomarker use in the clinical setting and biomarker data collection by cancer registries with utilisation for publication was performed and compared to national and international recommendation guidelines.

Results The systematic review retrieved a total of 1047 publications, 729 of which were selected for further analysis. The number of publications steeply rose with the beginning of the 21st century, and geographically more than half of the publications used data from the United States. Hospital-based and population-based cancer registries reacted with immediate collection of biomarker data following recommendation by clinical guidelines. A large number of the published data was based on hormone receptor and human epidermal growth factor 2 receptor statuses, for the differentiation into subtypes, predictive, and prognostic purposes. The frequency of publications with data from specific biomarkers corresponded to the recommended clinical guidelines.

Discussion Biomarkers are frequently used for predictive, prognostic, or pharmacodynamic purposes in the clinics. Currently, the use of collected variables varies between cancer registries; however, the harmonized collection of parameters such as biomarker data by cancer registries will enable the assessment of their diagnostic, prognostic, and therapeutic value on a large scale. This possibility underlines once more the importance of a common European data set for the evaluation and publication of cancer registry data, and potentially its extension to variables concerning biomarkers.

CO-10

DISTINCTIVE INCIDENCE PATTERNS OF FOLLICULAR LYMPHOMA IN TAIWAN: IMPLICATIONS OF ETHNIC DIFFERENCES

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Background Follicular lymphoma (FL) is less prevalent in Asians. This study aimed at characterization of the epidemiology features of FL in Taiwan to explore the factors relevant to disease development and prognosis.

Methods We obtained epidemiological data for Taiwanese citizens during 1990-2012 from the Taiwan National Cancer Registry Database, and the corresponding data for U.S. Caucasians from the Surveillance, Epidemiology, and End Results Program. Age-standardized rates according to diagnosis period were calculated by the direct method using the WHO 2000 world standard population. Changes in incidence rates were evaluated with joinpoint regression and age-period-cohort (APC) analyses. Patient outcomes between Taiwan and U.S. were compared by the 5-year relative survival rates (RS) estimates.

Results The age-standardized incidence rates of FL in Taiwan increased continuously during the study period, while those in the U.S. remained stable. Estimates of average annual percentage changes by joinpoint regression analysis for incidence were significantly positive in Taiwan, but not in U.S. Caucasians. Using APC analysis to dissect the individual effects contributing to this distinct trend, a strong birth-cohort effect was identified in Taiwan, corresponding to the environmental alternations in the study period. Regarding the treatment outcomes, the RS in both populations showed steady improvement, but the RS in Taiwanese patients were consistently 10-15% lower than that in U.S. Caucasians.

Conclusion A distinct increasing trend of incidence with a strong birth-cohort effect was identified in Taiwan, providing evidence of the association between environmental factors and disease development. The improved survival rates with time imply that therapeutic advances are changing the clinical courses; the more dismal outcomes in Taiwan is an unmet medical need warranting further exploration for the causes.





CO-11

WHEN PERFORMANCE OF CYTOGENETICS MATTERS: A POPULATION-BASED STUDY IN THE NETHERLANDS ON NEWLY DIAGNOSED MULTIPLE MYELOMA PATIENTS

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Introduction We set out to assess whether unperformed cytogenetics (UPC) is associated with poor outcome in young patients with symptomatic multiple myeloma (MM) who have received induction chemotherapy.

Methods Only patients treated with induction chemotherapy, i.e. treatment with VCD, VTD, CTD, PAD, BD or TAD +/- subsequent high dose melphalan and autologous stem cell transplantation (ASCT), were included for analyses. We identified 649 (89%, median age 59 years, 61% male) newly diagnosed patients with MM 18-65 years in 2014 and 2015 treated with induction chemotherapy from the nationwide population-based Netherlands Cancer Registry (NCR). UPC was defined as 'no sample was sent in for cytogenetic analysis'. Performed cytogenetics was grouped by Revised International Staging System (R-ISS), i.e. high-risk (translocations (4;14) or (14;16), deletion 17p) or standard-risk (other or no aberrations). Primary endpoint was progression-free survival (PFS), defined as time from start of first line induction chemotherapy to progression or death, whichever comes first. Patients alive without progression were censored at February 1st, 2017.

Results In 482/649 (74%) MM patients treated with induction chemotherapy, cytogenetics was performed and 153 of these patients (32%) were cytogenetically high-risk.

Achieving partial response or better was similar in the 3 cytogenetic subgroups (standard-risk 88%, high-risk 91% and UPC 89%, $p=0.8$).

PFS for patients in the standard-risk group was highest, as compared to patients in the high-risk or UPCs groups after one year of follow-up (88% vs. 84% vs. 81%, $p=0.006$).

Conclusion Cytogenetic testing is performed in more than 70% of MM patients between 18-65 years. Although response rates were similar for patients in the UPC, standard- and high-risk groups, PFS was highest in the standard-risk group. Patients with UPC had the poorest outcomes, a plausible explanation could be the patients' worse clinical condition at presentation which requires immediate treatment.

CO-12

DOES PSYCHOLOGICAL WELLBEING AFFECT QUALITY OF LIFE AMONG COLORECTAL CANCER SURVIVORS?

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Background Modern cancer care focuses not only on survival, but also on perceived health-related quality of life (QOL). Research already listed several demographic and clinical factors associated with QOL (e.g. sex, age, cancer treatment). More recently, patients' psychological wellbeing has been suggested to be related to QOL as well.

This study investigated whether colorectal (ex-)cancer patients with less wellbeing – defined as anxiety, depressive symptoms and/or negative illness perceptions – are characterized by a lower perceived QOL. We also examined which factors had the largest influence on QOL: wellbeing or demographic/clinical factors.

Methods In 2015, 1,171 Flemish adults, diagnosed with invasive colorectal cancer 4 to 7 years earlier, were invited to participate in a written QOL-survey. QOL was assessed with the general EORTC QLQ-C30 and the disease-specific EORTC QLQ-CR29 self-reporting questionnaires; wellbeing was evaluated using the Hospital Anxiety and Depression Scale (HADS) and the Brief Illness Perception Questionnaire (Brief IPQ). Survey data were linked with the population-based cancer registration database of the Belgian Cancer Registry to obtain additional patient and tumour characteristics and with diagnostic and therapeutic claims data from the health insurance companies. Multiple general linear regression models and variation partitioning were applied.

Results A total of 573 (49%) colorectal (ex-)cancer patients responded. More anxious patients and/or those with more depressive symptoms and/or negative illness perceptions had a lower overall, functional and symptomatic QOL. Wellbeing had the largest influence on overall QOL (accounting for 85% of the explained variation), on all but one item of functional QOL (between 50% and 89%) and on most items of symptomatic QOL (between 38% and 100%).

Discussion/conclusion Less wellbeing leads to lower QOL among colorectal (ex-)cancer patients. Psychological wellbeing rather than demographic and clinical factors was the main determinant of overall, functional and symptomatic QOL, indicating the benefit of psychosocial interventions to eventually improve QOL.

The role and integration of cancer registries in clinical outcomes

CO-13

COMPLETENESS OF MULTIDISCIPLINARY TEAM MEETINGS IN HEMATOLOGICAL MALIGNANCIES: A 4-YEAR POPULATION-BASED STUDY

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Objective To determine the completeness of presentation in multidisciplinary team meetings (MTM) for hematological malignancies (HM) and to analyze associated factors.

Methods A presentation in MTM for all HM diagnosed from 2010 to 2013 in a French area covered by a cancer registry (Tarn) was searched in the regional cancer file. Data were collected and analyzed regarding age, gender, year, stage at diagnosis for HM subtype, distance to medical facilities and deprivation index.

Results 1030 HM cases were analyzed, of which 69% were discussed in MTM. Completeness varied according to HM type, from 30% for histiocytosis to 94% for Hodgkin's lymphomas. It decreased in older patients, as well as in patients living closer to a medical laboratory, and in cases diagnosed in 2012. Both myelomas and chronic lymphocytic leukemias were presented more frequently when stage at diagnosis was high. MTM presentation was not linked to deprivation index or gender.

Conclusion Although all cancer cases must be discussed in a MTM in France, only 69% of HM were examined in the Tarn from 2010 to 2013. Cases in older patients were less examined, but the rate of presentation increased with severity in some types of HM.

CO-14

COMPLETENESS OF THE EXAMINATION OF CANCER CASES IN A MULTIDISCIPLINARY TEAM MEETING

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Objectives To determine the completeness of the examination of cancer patient cases in a multidisciplinary team meeting (MDTM), to study the factors that can affect this examination in the population.

Methods Completeness was estimated by comparing the database of the Tarn cancer registry containing all the inhabitants of this department for whom cancer was diagnosed between 2010 and 2013 with the list of patients living in Tarn whose cases were discussed during a MDTM. Determinants of the case discussion in MDTM were studied from data collected in medical records (age, sex, period, stage at diagnosis or other prognosis factor).

Results 11060 cases were studied. 72% were discussed during a MDTM. The proportion varies with the age of the patient. It decreases in older patients. It is different between men (76%) and women (67%), and varies depending on the tumor site. It also varies depending on the stage of the tumor, the most serious tumors are less often discussed in MDTM. The frequency of examination in MDTM increased steadily over time (69% in 2010 to 74% in 2013)

Conclusion In France the discussion CPR is mandatory for all new cancer cases. It is not what we observe. It is not certain that the cases discussed are those who are most in need.





CO-15

EUROPEAN HIGH RESOLUTION STUDIES: PATTERNS OF CARE FOR BREAST, COLORECTAL, LUNG CANCERS, MELANOMA AND NHL

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Background The High Resolution studies collect more clinical information than those routinely available to cancer registries (CRs) for random cancer cases, aiming to study patterns of care and adherence to evidence based guidelines for diagnosis and treatment. The database includes patients (≥ 15 years) diagnosed with breast (BC), colorectum (CRC), lung cancers, skin melanoma (MEL), and NHL (follicular and diffuse large-B cell lymphoma) in 2009-14 from 52 CRs in 13 countries.

Methods The present study analyses five cancer-specific indicators of standard treatment in 6 countries [Belgium, France, Italy, Portugal, Spain, Switzerland] for CRs with $< 30\%$ of unknown information in the analysed variables:

- Breast-conserving surgery and radiotherapy (BCS-RT) in 7085 stage I-IIA BC cases:
- Adjuvant CT in stage II/III CC cases surgically treated (1864 stage II and 1591 stage III cases):
- Curative surgery in stage I-II non-small LC (NSLC) (534 cases):
- Sentinel lymph node biopsy (SLNB) in ≈ 1 mm MEL (901 cases):
- Targeted therapy (TT) in NHL, after excluding cases with watchful waiting decision (1215 cases).

Results BCS-RT: 68% (34 out of 35 [34/35] CRs: 41% Portugal-77% France) of stage I-IIA BC;

Adjuvant CT: 23% (18 CRs: 12% Switzerland-30% Italy) of stage II CC and 64% (18 CRs: 44% Switzerland-70% Belgium) of stage III CC; Curative surgery: 65% (6 CRs: 56% Portugal-74% Switzerland) stage I-II NSLC;

SLNB: 66% (7/8 CRs: 57% Italy-74% Portugal) of ≈ 1 mm-Breslow MEL; TT: 83% (6/7 CRs: 71% Italy-90% France) of NHL.

Discussion Although some updating and corrections are still needed, information availability on stage work-up and therapeutic management was good. Differences in the adherence to clinical guidelines persist across Europe: resources availability, differences in health system organization and comorbidity at diagnosis could play a role. Multivariable comprehensive analyses, including comorbidity (where available), will be finalized after the conclusion of updating and corrections.

CO-16

USING REGISTRY DATA TO INVESTIGATE THE CHARACTERISTICS OF BREAST CANCER PATIENTS ASSIGNED TO SELF-DIRECTED AFTERCARE

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Background Recently, new models of cancer follow-up have been of interest due to the pressure that increasing cancer incidence and survivorship place on the healthcare system.

Methods Transforming Cancer Follow-up, a self-directed aftercare (SDA) programme, which initially focused on patients diagnosed with breast cancer was established in Northern Ireland (NI) in 2013. Upon completion of treatment, women were assessed for eligibility and those willing were assigned to SDA. Women assigned to SDA receive: training on symptoms of recurrence, annual mammograms for five years, details of a 'rapid access' phone-line (enabling women to re-enter the system within two weeks), surgical review at Year 1 and oncology review in Year 1, 3 and 5. This frees up seven review appointments compared to the previous follow-up model. This study aims to investigate the characteristics of breast cancer patients assigned to SDA compared to NI's total breast cancer population.

Disease and socio-demographic characteristics for invasive breast cancer patients (ICD-10 C50) assigned to SDA between 2013 and 2015 were extracted from the N.Ireland Cancer Registry database.

Results Preliminary findings show that a higher proportion of patients on SDA ($n=1,775$) were diagnosed at stages I and II (93%) compared to 74% of NI breast cancer population diagnosed between 2011-2015. Women on SDA were also younger, with 77% of patients diagnosed at < 70 years old, compared with 68% of NI breast cancer population. No significant association between assignment to SDA and deprivation was observed. The findings show differences in age and stage of patients assigned to SDA which may reflect suitability for SDA and will inform future service planning.

Conclusion The N.Ireland Cancer Registry is funded by the Public Health Agency of N.Ireland. This research has been funded by Macmillan Cancer Support as part of the Macmillan-NICR Partnership. This work uses data provided by patients and collected by the health service as part of their care and support.

The role and integration of cancer registries in clinical outcomes

CO-17

OUTCOMES OF BREAST CANCER TREATMENT IN INDONESIAN NATIONAL HEALTH INSURANCE SYSTEM CLIENTS

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Objective The aim of this study is to determine the outcome of breast cancer who followed the national health insurance system in Indonesia.

Methods Data were extracted from medical records of Dr. M Djamil General Hospital Padang who had been followed up for at least 5 years (January 1st in 2010 until December 31st in 2015). Disease-free survival and overall survival rates were analyzed using the SPSS program. The data analysis was done descriptively and Kaplan-Meier's method of survival analysis to determine the outcome of treatment

Results A total of 242 women fulfilled the criteria of the study but only 186 have complete follow-up. The patients, in general, is women (98.64%), the highest frequency distribution of patient age was at the age interval 40-49 years (44.59%). The range of the stage of disease were stage I 5,4%, stage II 36,5, stage III 53,8 and stage IV 24,3%. The most frequent histopathology type was Invasive Ductal Carcinoma type of 66.21%. The type of surgery were Modified Radical Mastectomy 52.70%, BCT 7,5%, Radical classic mastectomy 6 %, paliatif surgery 33,78%. Radiotherapy were done in 50% patients and only 81.08% complete. Chemotherapy were done in 68,9% patients and completed only 64,7%. The distribution of patients who undergo hormonal treatment were Tamoxifen 59.45%, Aromatase Inhibitor 37.85%, Bilateral ovariektomy 2,7%. The result of RS Dr. M.Djamil Padang 5-year survival rate of stage I breast cancer patients was 100%, stage II 60,53%, stage III 35,89% and stage IV is 0%.

CO-18

END OF LIFE TREATMENT OF METASTATIC LUNG CANCER PATIENTS IN THE NETHERLANDS, A POPULATION-BASED STUDY

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Background Systemic anti-cancer treatment in the last weeks of life is considered an indicator of aggressive end of life care. Internationally, a rise in aggressive treatment is seen, but information for European lung cancer patients is lacking. We therefore explored developments in treatment modalities and aggressive therapy for patients with metastatic lung cancer.

Methods Patients with metastatic lung cancer (2005-2013) who died \leq 9 months from diagnosis were selected from the Netherlands Cancer Registry, including information on first line therapy. Aggressive treatment was defined as any form of active cancer treatment in the last month of life.

Results The most prevalent treatments were best supportive care, systemic treatment and radiotherapy in both non-small cell (NSCLC) and small cell lung cancer (SCLC) (N=32,630). Most notable changes were a small increase in systemic treatment in NSCLC (33% in 2005-2007 to 36% in 2011-2013 ($p < 0.01$)) and increase of prophylactic brain irradiation in SCLC (2-13%, $p < 0.01$). Aggressive treatment remained stable at circa 30% for NSCLC, but for SCLC the proportion of aggressive treatment decreased (34 % in 2005-2007 to 27% in 2011-2013 ($p = 0.03$)). Survival benefit of patients treated with aggressive therapy compared to best supportive care was only 23 days.

Conclusions Among patients with metastatic lung cancer who died within 9 months after diagnosis, best supportive care, systemic treatment and radiotherapy remained the most common treatments. We did not find an increasing rate of aggressive treatment at the end of life. However, 30% were treated until very close to death and there was little survival benefit for those receiving aggressive treatment. The challenge remains predicting which patients will survive long enough to benefit from treatment.



Theme: The role of cancer registries in screening programmes and prevention



SPP-1

BREAST CANCER SCREENING IN LITHUANIA: TRENDS IN INCIDENCE AND STAGE DISTRIBUTION

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Background Reduction of advanced cancer incidence and increasing incidence of early stages breast cancer (BC) could serve as early indicators of impact of screening. In 2005 the mammography screening program (MSP) was started in Lithuania. The aim of this study was to analyze incidence trends of early and advanced stage BC before and during the implementation of MSP in Lithuanian population.

Methods The study was based on all cases of invasive female breast cancer reported to the Cancer Registry during 1998–2012. The study period was divided in two intervals: pre-screening period (1998-2005) and the implementation period (2006-2012). Analysis was performed in three age groups: 0–49 years; 50–69 (target population) and 70+. Stage I was defined as tumors with T-stage T1 (= 20 mm) and no lymph node involvement); advanced stage included tumors T2, T3 and T4 or any number of affected lymph nodes. The joint point regression model was used to provide estimated annual percentage change (APC).

Results In our study the BC incidence from 1998 to 2012 increased significantly from 61.7 per 100.000 to 95.2 per 100.000 (APC 3.0; 95 % CI 2.3;3.5). In target population incidence rates of I stage BC increased significantly during study period (APC 10.6; 95 % CI 9.0;12.2), however, no effect of introduction of MSP on this trend was seen – the increase was bigger before implementation of MSP (APC in the pre-screening period 10.2 (95% CI 6.5;14.1), during implementation 6.3 (95% CI 3.0;9.6). The similar trend was seen in other two age groups not affected by MSP. Incidence rates of advanced BC were stable (APC -0.6; 95 % CI -1.3;0.0) in target population as well as in other age groups.

Conclusion MSP implementation in Lithuania was not associated with an increase of I stage or decrease of advanced BC incidence.

SPP-2

ORGANIZED BREAST CANCER SCREENING RELATED TO MORTALITY RATES IN LATVIA, 2011-2015

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Background Breast cancer is one of the most common cancer forms and most frequent cause of cancer death in Latvian females. Population based mammography screening programme in Latvia was adapted in female population aged 50 to 69 in 2009.

Methods The study analysed data of breast cancer cases found by the population based screening programme and breast cancer cases found without screening. The study included data from the National Register of Patients with Particular Diseases including patients with cancer in Latvia and Register of Causes of Death in Latvia. The sample included data on female breast cancer cases from 2011-2015 divided into two groups: screening (n=917) and control group (n=1728). Odds ratio, mortality, mortality of first year, average survival days and also distribution of stages were calculated to provide mortality rate comparison.

Results The screening group has got 65% lower mortality risk compared to the control group (OR= 0.35; 95%CI=0.28-0.44; p<0.0001). Mortality in the screening group is 9.68 cases per 100 women and in the control group 23.03 cases per 100 women. Mortality in general female population aged 50 to 69 is 0.84 cases per 100 women. The average survival days in the screening group is 1166 (95%CI=1132-1199; p<0.0001), the control group - 1032 (95%CI=1005-1059; p<0.0001). The difference between the average survival days is 134 (95%CI=90-178; p<0.0001) days. Mortality of the first year in the screening group is 1.6%, but in the control group 11.2%.

Conclusion There is lower mortality risk and mortality of the first year in the screening group as well as more average survival days. These results may indicate screening effectiveness, however mortality can be related to another factors not included in this study.

SPP-3

THE SURVIVAL RATE OF CANCER PATIENTS - AN OBJECTIVE CRITERION CANCER DIAGNOSTICS IN THE RUSSIAN FEDERATION

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To assess the effectiveness of anticancer events in Russia used five-year survival indicators in the early stages.

To assess the quality of diagnosis of malignant neoplasms in the period 2005 to 2009. in seven regions the comparison of the actual performance 5-year relative survival rates in cancer patients 1 tbsp. and 2 tbsp. of the process with their standard values (90% and 80%, respectively) identified in a survey of leading oncology experts.

There is a significant difference between values of the above indicators with their standards. So, in the Komi Republic, 5-year relative survival of men was 71.0 per cent (1 st.) and 48.0% (2 st.), Murmansk region – 72,0% (1st.) and 52.0% (2 st.), Arkhangelsk – 73,0% (1 st.) and 52.0% (2 st.), the Republic of Karelia, 76,0% (1 st.) and 57.0% (2 st.), Pskov region – for 84.0% (1 st.) and 53,0% (2 st.), St. Petersburg- 84,0% (1 st.) and 69,0% (2 st.), the Samara region - 91,0% (1 st.) and 67.0% (2 st.); among women: in the Arkhangelsk region - of 88.0% (1 st.) and 66,0% (2 st.), in the Komi Republic of 88.0% (1 st.) and 69,0% (2 st.), Murmansk region - 90,0% (1 st.) and 68.0% (2 st.), Pskov - 92,0% (1 st.) and 73,0% (2 st.), Samara - 96,0% (1 st.) and 71,0%(2 st.), the Republic of Karelia, 95.0% of (1 st.) and 76,0% (2 st.) and in Saint-Petersburg – 94,0%(1 st.) and 78,0%(2 st.).

Thus, the most effective anti-cancer activities are carried out in Saint-Petersburg, Samara and Pskov regions, the Republic of Karelia.

The method of estimation of survival of cancer patients is the most objective integral criterion for assessing the quality of cancer diagnostics the indicators of early diagnosis and neglect.

SPP-4

ESTABLISHING AFGHANISTAN'S FIRST CANCER REGISTRY

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Background It is clear Afghanistan has very limited capacity and resources for cancer surveillance purposes. This can explain why there is a lack of accurate cancer data and statistics available on the country. Cancer registries play a pivotal role in planning and strategizing cancer prevention and control; thus, the Afghan Ministry of Public Health recently hired a research consultant and cancer registry officer to join the national cancer control program and work on establishing the first ever hospital-based cancer registry (HBCR) in Jamhuriat Hospital, currently the single existing cancer center in Afghanistan. Developing the cancer registry has proven to be very challenging. There is a huge need for building capacity, infrastructure, and acquiring resources for successful cancer registration.

Methods Our hope is to sign a memorandum of understanding with the International Agency for Research on Cancer (IARC) to provide technical support for the new registry. We are also currently working closely with our Health Information Systems department on developing an electronic medical record system to improve the overall hospital information system and also allow for more efficient abstraction of data for the planned cancer registry. We have consulted leading experts such as the World Health Organization (WHO) who recommended CanReg5 software as a tool for cancer data collection; we have taken the necessary steps to arrange relevant training for our team.

Results We believe we can improve our ability to collect, store, analyze, and report on high-quality cancer data in Afghanistan by taking these steps and by receiving support and collaborating with knowledgeable colleagues in the field. Though we are starting with a lone HBCR, our eventual goal is to work towards establishing a population-based cancer registry and creating an effective way to report multiple HBCR data to a central national registry.

Conclusion We will report on our challenges and progress at the conference.



Theme: The role of cancer registries in screening programmes and prevention



SPP-5

THE IMPACT OF BREAST CANCER SCREENING ON CANCER STAGING AT DIAGNOSIS IN THE GREATER POLAND

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Background The Early Detection Breast Cancer Program was implemented in Poland in 2005. Software used to run the program does not collect data on cancer staging at diagnosis, as required by the European guidelines for quality assurance in breast cancer screening and diagnosis. Therefore, population-based epidemiological studies on the effectiveness of breast cancer screening in Poland depend on data gathered by Cancer Registries, i.e. cancer staging at diagnosis and participation in screening.

Methods Cancer staging at the time of diagnosis was compared in 9,568 patients from Greater Poland region, aged 50-69 participating and not participating in screening between 2005 and 2014. The “Cochran-Armitage test for trend” was used in statistical analysis with a 0.05 significance level. Calculations were performed using PQStat v1.6.6

Results In the study population most patients were diagnosed with stage I breast cancer (4588; 48%), and patients with stage IV breast cancer at diagnosis were the smallest group (483, 5%). Overall 30% of women diagnosed with breast cancer participated in screening. Screening participation varied significantly ($p < 0.0001$), and was correlated to disease severity at diagnosis: for stage I 59% (screening) vs. 43% (no screening), stage II 13% vs. 13%, stage II 13% vs. 17%, stage IV 1% vs. 7%.

Discussion/Conclusion The purpose of screening is reduction of mortality. The most important prognostic factor in breast cancer is staging at diagnosis. Our results indicate that women who participated in screening were diagnosed with less advanced cancer, this applies especially to more stage I and less stage IV patients. It is worth noting that the above-mentioned results were obtained despite the lower than recommended by the EC screening participation rate of 70% (51% for Greater Poland).

SPP-6

BREAST CANCER RISK, STAGE AT DIAGNOSIS AND BREAST SCREENING AMONG IMMIGRANT AND NON-IMMIGRANT WOMEN IN BRITISH COLUMBIA, CANADA

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BC Cancer Agency, Canada; University of British Columbia, Canada

Background Among G8 countries, Canada’s population is proportionally among the highest for foreign-born residents. Canadian breast screening rates have been disappointingly low with few investigations into screening uptake among Canadian immigrants. Prior Canadian data suggest some immigrant populations may be under-screened for breast cancer (BrCa) and present with more advanced disease. Our study assesses BrCa risk, severity at diagnosis and screening behavior in immigrant and non-immigrant (NI) populations.

Methods Linked-health and immigration data were accessed for screening-eligible women for the province of British Columbia (BC), Canada with a population of more than 4.5 million residents. The study cohort was identified from provincial health registration files and linked to national immigration data to ascertain immigration details. BrCa diagnoses were obtained from the BC Cancer Registry. Information on breast screening and health service use were obtained via linkage to administrative health data. Overall and stage-specific age-standardized BrCa incidence rates were generated by group. Measures of BrCa severity and screening history were also compared.

Results BrCa rates were lower in immigrant populations compared to NI women. South Asian immigrants (SAI) had the lowest rates of BrCa, however, the rate of stage II-IV was markedly higher than the rate of stage I; Chinese immigrants (CHI) had a lower rate of stage II-IV compared to stage I. NI and other immigrant populations had a slightly higher rate of stage II-IV tumours compared to stage I. Examining the characteristics of incident cancers, SAI had more node-positive and larger tumours compared to NI women; SAI also had a lower frequency of stage 0/I tumours. History of screening was lower among SAI (66%) compared to CHI (70%) and NI (75%) women.

Discussion Our results suggest SAI women may present with more advanced BrCa. Results from regression models will be presented to further describe this relationship.

SPP-7

TIME TRENDS IN CERVICAL CANCER INCIDENCE AND MORTALITY IN THE REGIONAL HEALTH DISTRICT (RHD) OF BARRETOS, SÃO PAULO, BRAZIL

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Background Among women, cervical cancer is the 4th most incident type of cancer worldwide, while in Brazil it is the 3rd. The purpose of this study was to analyze time trends in cervical cancer incidence and mortality among women in the Regional Health District (RHD) of Barretos, São Paulo, Brazil from 2000 to 2014.

Methods We calculated cervical cancer incidence rates using data from the Population-Based Cancer Registry of the RHD of Barretos, and cervical cancer mortality using data from the Official State Database. Both incidence and mortality rates per 100,000 women were age-standardized to the world population. Time trends were obtained using the Surveillance, Epidemiology and End Results software Joinpoint Regression program version 4.4.0.0 to calculate the annual percentage change (APC) for cervical cancer incidence and mortality.

Results During the study period, 870 incident cases (invasive $n = 328$; in situ $n = 542$) and 128 deaths were reported. Age-standardized incidence rates for invasive cervical cancer were 10.2 in year 2000, before cervical cancer screening was widely available, and 9.87 in 2014 (APC = -1.99, 95% CI: -5.1 ; - 1.2). For in situ cases, age-standardized rates were 1.55 in year 2000 and 13.52 in 2014 (APC = 10.41; 95% CI: 5.6 ; 15.4). Opportunistic screening started to be offered in year 2008. Age-standardized mortality rates varied from 4.32 in year 2000 to 2.78 in 2014 (APC = -6.03, 95% CI: -10.8 ; -1.0).

Conclusion There was a marked increase in the incidence of in situ cervical cancer and decrease in invasive incidence rates during the study period, probably due to screening program adopted by Barretos Cancer Hospital. Cervical cancer mortality significantly decreased during the study period.

SPP-8

COMPARISON OF SURVIVAL RATES IN COLORECTAL CANCER PATIENTS BY SCREENING, SOCIODEMOGRAPHIC AND CLINICAL CHARACTERISTICS

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Background This study has the purpose to grasp risk factors on survival time and death by expanded diagnostic path variables of cancer registration data for building a cancer surveillance system and to verify the importance of early cancer screening.

Methods This research is for 609 colorectal cancer patients in cancer registration office, cancer center of one region from January 01, 2010 to December 31, 2015. We calculate the relative risk of death by Kaplan-Meier survival curve, logrank test, sociodemographic and clinical characteristics of Cox proportional hazard model. We confirm the stage shift effect by SEER stage and grasp risk factors on survival time and death.

Results Median survival time of 110.8 months in screened group and 75.3 months in non-screened one. Survival rate per year of screened group is 88.8% in 1 year, 77.0% in 3 years and 71.9% in 5 years; in non-screened group, 79.6% in 1 year, 64.5% in 3 years and 58.9% in 5 years. All survival rates in screened group are higher and this is significant. ($P < .0005$) In Cox proportional hazard model, final control model (B) in the first stage, death risk in screened group are 25.3% lower and this is significant. ($P < 0.0486$) In subgroup analysis by SEER stage in the second stage, the death risk in screened group is 38.0% in localization, 17.0% in region and 26.0% in distant metastasis; all death risks in screened group are lower, but this is not significant. Therefore, we confirmed the stage shift effect by SEER stage.

Conclusion This research indirectly suggests the importance of early cancer screening because we compared the difference in survival time between two groups by diagnostic path variables, did the subgroup analysis by SEER stage, clarified the stage shift effect by two groups and proved that SEER stage of screened group was low.



Theme: The role of cancer registries in screening programmes and prevention



SPP-9

EVALUATION OF THE FLEMISH CERVICAL CANCER SCREENING PROGRAM BY THE BELGIAN CANCER REGISTRY

Annemie Haelens PhD, Eliane Kellen MD PhD, Valérie Fabri, Caroline Androgé, Lien Asselman, Harm Vermeulen, Julie Francart, Liesbet Van Eycken

Belgian Cancer Registry, Brussels, Belgium; Center for Cancer Detection, Bruges Belgium; UZ Leuven, Leuven, Belgium; Inter-mutualistic Agency, Brussels, Belgium

Background The Agency for Care and Health finances the organization of the Flemish cervical cancer screening program. The organised screening was set up in 2013 for women aged 25 to 64 with cytology as screening test. Besides new cancer diagnoses, the BCR collects all anatomo-pathological results of cervical samples in a central cyto-histopathological registry, which is completed with administrative data from health insurance companies.

Methods BCR plays a crucial role in the cost-effective organisation and the quality assurance of the screening program due to the centralisation of these data and the possibility of linking at the personal level using a unique patient identifier. At the request of the Agency for Care and Health, BCR yearly calculates several quality indicators by linking these databases with a Flemish population registry.

Results In 2013, 64% of the target population was covered by the screening program. 7% of the eligible women had an abnormal screening. 27% of the women with an abnormal screening had no follow-up within one year. 236 new invasive tumours were diagnosed within the target population. Analysis of the screening history revealed that 111 of these tumours were diagnosed in women that were not screened within 5 years before. About 40% of the tumours in these non-screened women are stage I. In contrast, more than 70% of the women who had at least one screening in the last 5 years had a stage I tumour. 82 of the 236 women with an invasive tumour were tested for HPV in the past 5 year, whereof 10 with a negative HPV test result.

Discussion/conclusion These quality indicators reveal the weaknesses in the screening program, which give rise to policy decisions to increase the quality of the program. Centralisation of databases and the possibility of individual linking are crucial to a successful screening program.

SPP-10

CONTRIBUTION OF THE BELGIAN CANCER REGISTRY TO CANCER SCREENING PROGRAMS

Isabel De Brabander MSc, Annemie Haelens PhD, Birgit Gielen PhD, Petra Denolf MSc, Inge Truyen MD, Patrick Martens MD, Michel Candeur, Jean-Benoit Burrion MD, Julie Francart PhD, Liesbet Van Eycken MD

Belgian Cancer Registry, Brussels; Belgian; Inter-mutualistic Agency, Belgium; Centrum voor Kankeropsporing, Belgium; Centre Communautaire de Référence pour le dépistage des cancers, Belgium; Brumammo, Belgium

Objectives Due to its extensive databases, the Belgian Cancer Registry (BCR) plays a pivotal role in the organization and monitoring of the Belgian screening programs for breast, cervical and colorectal cancer. Main objective is to guarantee the effectiveness, efficiency and quality of these early detection programs, in conformity with privacy and data protection regulations.

Materials and methods The BCR covers patient and tumor characteristics at the population level from 2004 onwards. Additionally, BCR collects all pathology results of cervix, colon and breast specimens, regardless the diagnosis, from 2008 onwards, in the Cyto-histopathological data base (CHP). In addition, these data are completed with administrative data from the Health Insurance Companies (HIC), related to diagnostic and therapeutic procedures. These databases are regularly linked with screening data using a unique patient identifier and in accordance with data security guidelines. Hence, the BCR serves as an important source of deliverables, which are defined through close collaboration with regional based screening organizations and according to international guidelines.

Results The BCR compiles exclusion lists, consisting of persons who will not benefit from screening, enabling a cost-efficient invitation process. In addition, screen detected cancers and interval cancers are yearly identified to evaluate the screening program performance. Furthermore, tumor characteristics are compared and reported by the BCR next to quality indicators, including coverage, detection rate and compliance to follow-up. The follow-up of abnormal screening tests is also analyzed in detail, facilitating the set-up of a fail-safe procedure which allows to identify persons without follow-up.

Conclusions Close collaboration between BCR and the regional based screening organizations plays a central role in the cost-effective organization and quality assurance of the screening programs due to the linkage of the cancer registry, the CHP data base, HIC data and screening data at personal level, while respecting privacy regulations.

SPP-11

TOBACCO CESSATION: NEED OF THE CANCER CONTROL PROGRAMME IN INDIA

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Background The National Cancer Registry Programme (NCRP) of India has 29 Population Based Cancer Registries under its umbrella. There is a significant variation in the proportion and pattern of tobacco related cancers (TRC) reported by these registries. Sites of cancer that have a strong association with the use of tobacco are cancer of lip, tongue, mouth, oropharynx, hypopharynx, oesophagus, larynx, lung and urinary bladder.

Method Data from 29 population based cancer registries was used to study the proportion of tobacco related cancers and the pattern tobacco usage in the respective population. Proportion and incidence of specific tobacco related sites were also studied to examine the variation in their incidence due to difference in mode of tobacco usage.

Results Among males the highest proportion of TRC (69.3%) was recorded by the registry at Meghalaya. The region also reported the highest prevalence of tobacco usage amongst males 73.2%. Mouth cancer was the leading site of TRC in ten registries; these registries had a higher proportion of tobacco chewing. Similarly smoking was more common in populations having Lung as the leading site of TRC. Lung cancer was the leading TRC in eight registries and oesophagus in seven registries. Among males Bhopal registry recorded the highest incidence of Tongue (ASR=9.8/100,000) and Mouth (ASR=12.5/100,000) Cancer and in the world. 43% of the male population were tobacco chewer.

Conclusion The country continues to record highest incidence of oral cancers in the world. The incidence and relative proportion of specific sites of tobacco related cancers varies according to the type and manner of its consumption. The findings prompt the stakeholders to define the cancer control programme in the country. Integrating data from different sources to identify the target population and strike the root cause leading to tobacco usage in the population.





*ENCR-JRC Symposium and
ENCR General Assembly*

The ENCR-JRC Symposium and ENCR General Assembly will take place on 19 October from 14:00 to 18:00. At this event the newly elected and nominated members of the ENCR will be announced. An overview of the ENCR-JRC project “Incidence and Mortality in Europe” will be presented. In addition a summary of the EURO CARE Project and the integration of the survival indicators into the European Cancer Information System (ECIS) will be outlined. The ENCR-JRC Working Group on quality checks, including updating the document “One common procedure” and related quality checks software, will be discussed along with the revisions of the ENCR recommendations i.e. updating the “Multiple primary tumours” and “Date of incidence” coding rules. An update on training courses, site visits and support to the registries will be presented. An open discussion session will give the audience an opportunity to participate.

1. Towards the European Cancer Information System (ECIS)

Cancer is one of the most common causes of death in the European Union. In 2009, the European Commission adopted the Communication on Action Against Cancer: European Partnership. This Communication defines several objectives to reduce the burden of cancer in Europe. One of these objectives is to ensure the computation and dissemination of accurate and comparable data on cancer incidence, prevalence, survival and mortality in the EU.

The European Commission’s Joint Research Centre (JRC), in its scientific and technical role, is in the process of establishing the “European Cancer Information System (ECIS)” on behalf of the Commission services and in close collaboration with the European Network of Cancer Registries (ENCR) together with other key stakeholders in the cancer information domain.

The aims of the ECIS include:

1. Monitoring the cancer burden (and its changing trends over time) across the regions of Europe;
2. Assessing the magnitude of the cancer burden and its likely future evolution;
3. Illustrating the effects of health policy interventions aimed at reducing the overall cancer burden;
4. Establishing a reference base for cancer epidemiological research;
5. Providing information for further research on possible underlying causes of cancer as well as best practices on prevention, treatment and control;
6. Providing information and educational resources to the general public to explain the variations observed in different populations.

2. Role of the European Commission’s Joint Research Centre (JRC) and support provided to the European Network of Cancer Registries (ENCR)

Standardisation of procedures for processing data across population-based registries is essential for accurate and reliable comparisons of cancer measures, including incidence, mortality, prevalence, and survival. However, the process of harmonizing data collection across Europe requires considerable collaboration. Harmonisation of practices, including agreement of methods and standards, is one of the key tasks of the JRC and ENCR.

The JRC was established in 1957 and provides a scientific and technical service to the European Commission services. It is independent of all national, commercial, and private interests and has a proven track record in the harmonisation and standardisation of scientific/technical processes and systems. JRC is acting on behalf of the Commission services to harmonised data on cancer in Europe.

The European Network of Cancer Registries (ENCR) was established in 1989 within the framework of the Europe Against Cancer programme of the European Commission on the initiative of the International Agency for Research of Cancer (IARC), the Association of Nordic Cancer Registries (ANCR), the International Association of Cancer Registries (IACR) and the Group of Registry and Epidemiology of Cancer in Latin Speaking Countries (GRELL). The ENCR promotes collaboration between cancer registries, and is active in helping define cancer-registry data-collection standards, as well as providing training for cancer-registry personnel and regularly disseminating information on cancer incidence and mortality in Europe.

Since 2012, JRC has hosted the secretariat of the ENCR SC. The synergistic partnership between the ENCR and the JRC since that time has given a new impetus to the work of cancer registration in Europe. This partnership has contributed to the further harmonisation of data-quality standards, the development of data quality-check software, and the launch of the ENCR-JRC project on “Incidence and Mortality in Europe”, in collaboration with the majority of the European cancer registries and stakeholders.

3. Sources of data for ECIS: European Cancer Registries and the 2015 Call for Data

Cancer registration is a continuous process of systematic collection, storage, analysis, interpretation, and reporting of data on the occurrence and characteristics of cancer. Data from population-based cancer registries are vital for setting up a cancer information system for Europe.

In Europe there are approximately 250 population-based cancer registries. These registries provide varying degrees of information on cancer cases, with varying degrees of geographical coverage ranging from national to regional and local coverage. Differences between registries are related not solely to population coverage but also to data qua-

lity and comprehensiveness of reporting.

In June 2015, the ENCR and the JRC launched the 2015 Call for Data addressed to all European population-based cancer registries, with the aim of establishing a single European cancer-registry data repository for the purpose of a European wide study on cancer incidence and mortality. A protocol was drafted by a joint working group involving the ENCR Steering Committee, the JRC, IARC and several European and international project teams. The metadata description relating to the call was detailed in submission guidelines ensuring standardised data-collection and -processing procedures. A common procedure to validate cancer data was also agreed and published, including a standardised list of quality checks for internal consistency of the collected variables. In order to support this endeavour, a number of support tools were developed and freely distributed, including an electronic data portal for secure data submission, enabling a single automated and transaction-logged data-upload mechanism, and a data quality-check software toolkit for the validation of data sets.

Cancer registries participating in the study were also requested to complete a questionnaire on the registration process to facilitate data processing and interpretation.

Via functionality provided by the ENCR-JRC data portal, cancer registries had the option of forwarding their data to several other studies, including the EURO CARE-6 study and the IARC CI5 – Volume XI.

4. The ENCR- JRC project on Cancer Incidence and Mortality

The ENCR-JRC project has created a database comprising a set of standardised and comparable cancer-registry data describing cancer incidence and mortality in Europe. The data will be used to provide comparable statistical indicators by cancer site, sex, age group, calendar period, geographic area, and morphology groups.

In total, 147 population-based cancer registries from 32 European countries have participated in the ENCR-JRC project.

The immediate results of the analyses will be disseminated through reports, scientific papers, atlases and factsheets on the burden of cancer in Europe. The outputs will be produced in collaboration with the cancer registries and the ENCR SC.

5. Visualisation and dissemination of cancer burden indicators: the ECIS web-application

The ECIS web application has been developed by the JRC and consists of a number of interactive data-visualisation tools to facilitate navigation, selection and analysis of statistical indicators and analysis out of the cancer registry data. The user can find detailed incidence, mortality and survival analyses. All tables, maps, charts and graphs are interactive and downloadable.

News from ENCR-JRC and on-going activities:

THE NEWLY ELECTED ENCR STEERING COMMITTEE 2017-2020

The five newly elected members of the Steering Committee along with the representatives from IARC, GRELL, NORCAN and IACR will be announced during the Symposium.

TRAINING COURSES FOR CANCER REGISTRY STAFF

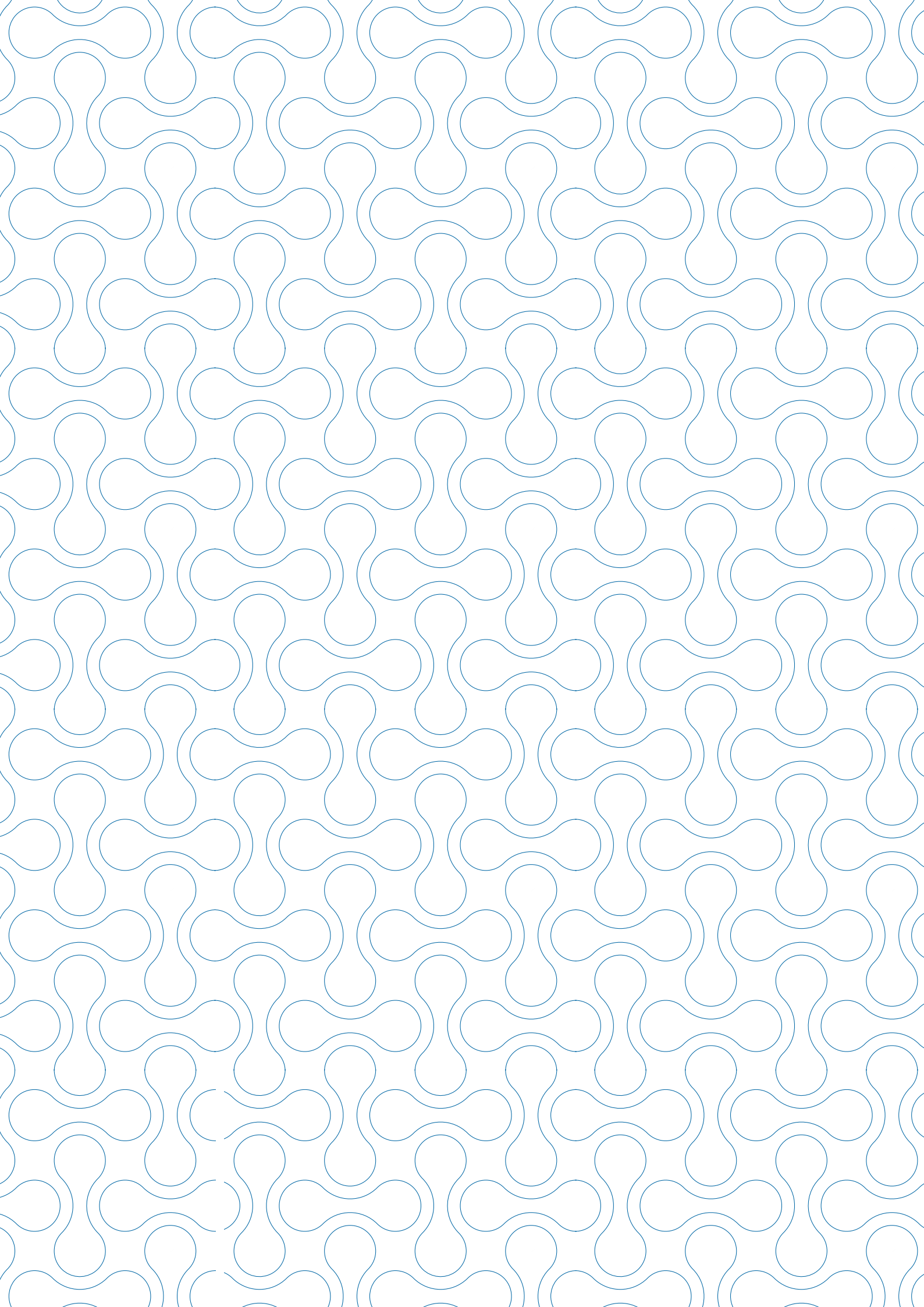
Training for cancer registry staff is a priority for the ENCR SC and JRC. A number of training events were organised in 2016 and 2017 including a training event on data protection and comparability for cancer registry staff in May 2017. A course on Data Protection will be organised in December 2017. In addition, web high quality training-oriented documents, approved by the ENCR SC, will be available on the ENCR website.

JRC- ENCR QUALITY CHECK SOFTWARE

JRC is working on an open-source version of the JRC-ENCR quality checks software, distributed in its first version in 2016 and aim to improve the quality and comparability of the data submitted to the ENCR-JRC call. This stand-alone software enables cancer registries to perform data quality checks on their own to ensure that data are processed according to the ENCR-JRC guidelines “Cancer Data Quality Checks: One Common Procedure for European Cancer Registries”.

UPDATING THE ENCR RECOMMENDATIONS ON CODING “DATE OF INCIDENCE” AND “MULTIPLE PRIMARIES”

Two ENCR Working Groups were set up in 2016 and updated ENCR Recommendations on coding “Date of Incidence” and “Multiple Primaries”. More information on the updated guidelines will be available soon on the ENCR website.





1 JAARBEURS UTRECHT, CONFERENCE VENUE

2 UTRECHT CENTRAL STATION

3 IKNL-OFFICE: Godebaldkwartier 419 (ingang Janssoenborch), 3511 DT Utrecht | **WORKSHOP 1, october 16th**

4 HOFMAN CAFÉ: Janskerkhof 17^a, 3512 BM Utrecht **monday** | **IACR WELCOME RECEPTION, october 16th**

5 VIEBRUG: Oudegracht 85, 3511 AD Utrecht | **departure CANAL CRUISE, october 18th**

6 DE WINKEL VAN SINKEL: Oude Gracht 158, 3511 AZ Utrecht | **IACR SOCIAL DINNER, october 18th**