

Czech National Information System for Cancer Control and Management

... and its readiness for organized prostate cancer screening



Prostaforum, Prague, 24.11. 2022



MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

ÚZIS Ústav zdravotnických informací a statistiky ČR
Institute of Health Information and Statistics of the Czech Republic

The Czech system gained a lot experience from Joint Action projects

Focus on prevention

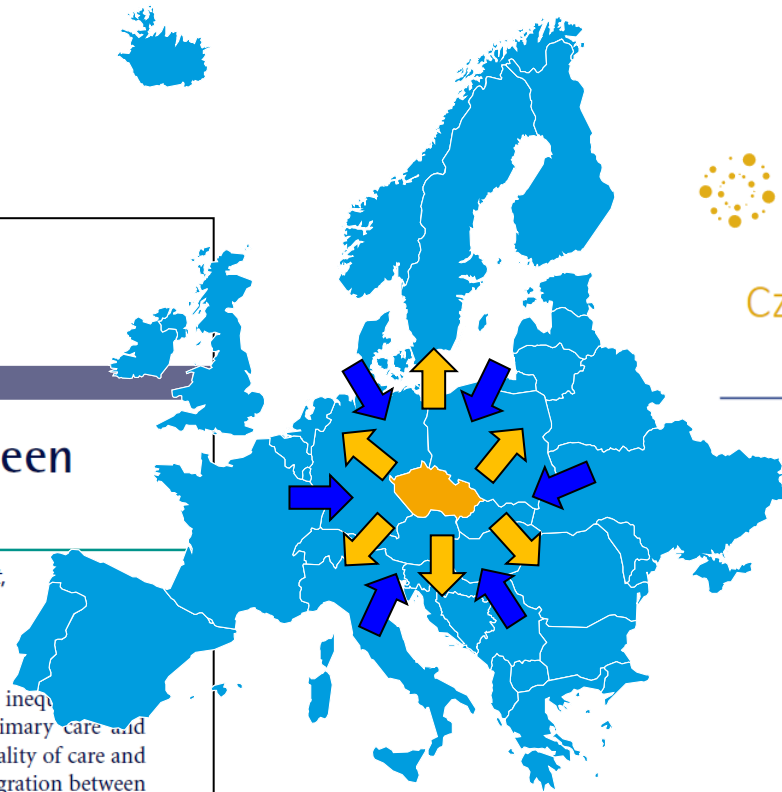
Patient-centred model of care

Cancer centers networking

Integrated cancer control

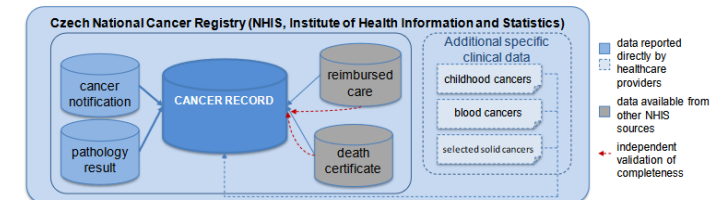


<https://ecpc.org/policy/joint-action-on-cancer-control-cancon/>
<https://www.ipaac.eu/>



Czech comprehensive ICT model integrating multiple data sources

Description and implementation guide



64 Patient-Centred and Integrated Cancer Care

PERSPECTIVE

13 Integration of Cancer Care between Primary Care and Hospitals

Peter Selby, Geoff Hall, Ladislav Dusek, Fotios Loupakis, Lucio Luzzatto, Tit Albreht, Richard D. Neal, Rob Turner, Sean Duffy

Introduction

Despite encouraging progress, outcomes for cancer patients are still patchy and inequally apparent even across Europe.¹⁻³ Integrated cancer care, bringing together primary care and hospital care and forming closer links between institutions, can improve the quality of care and outcomes for patients.⁴ This chapter summarizes approaches to improving integration between

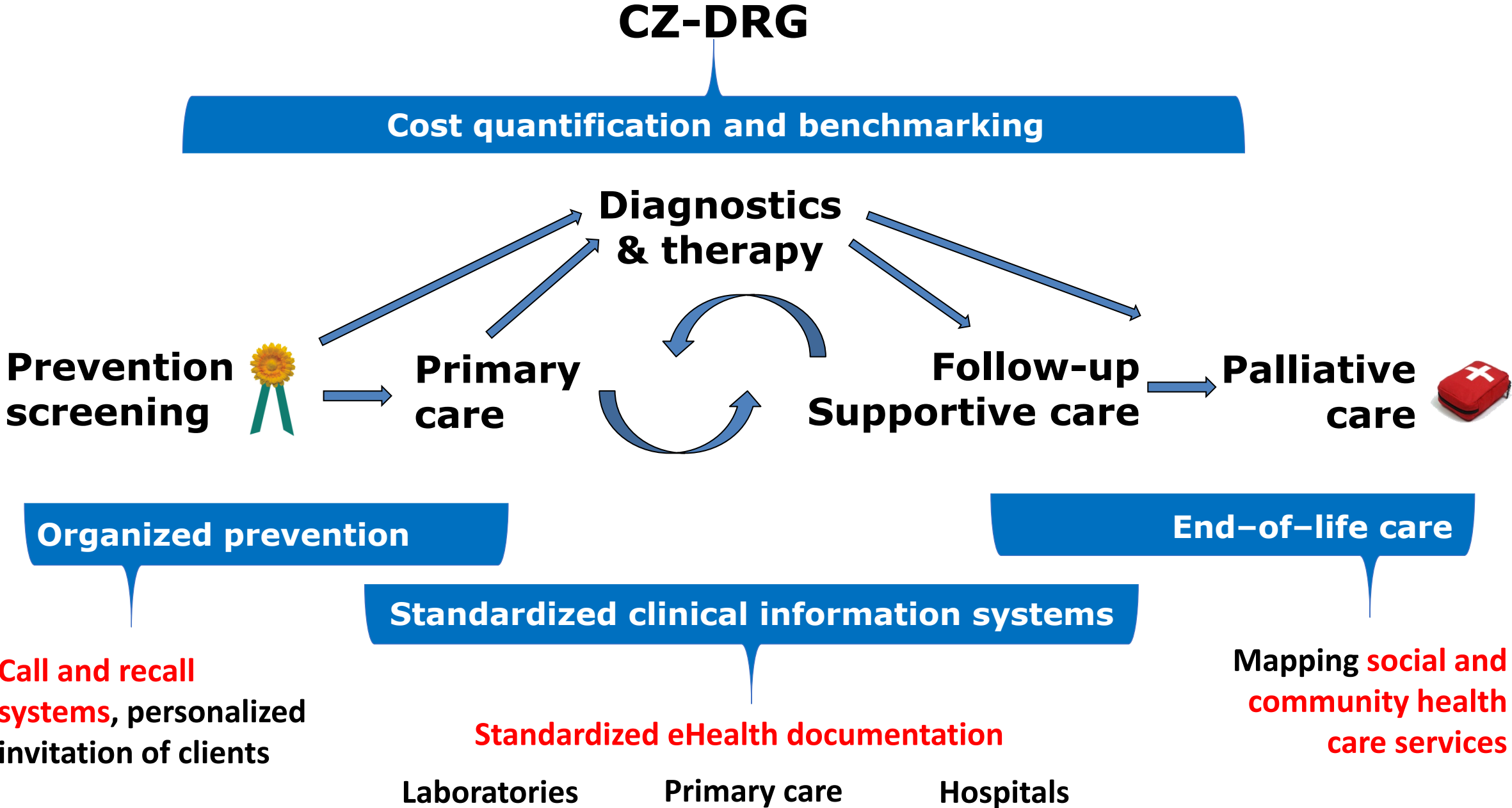
Organized, population-based cancer screening program

needs

**COMPREHENSIVE DATA
AND INFORMATION BACKGROUND**



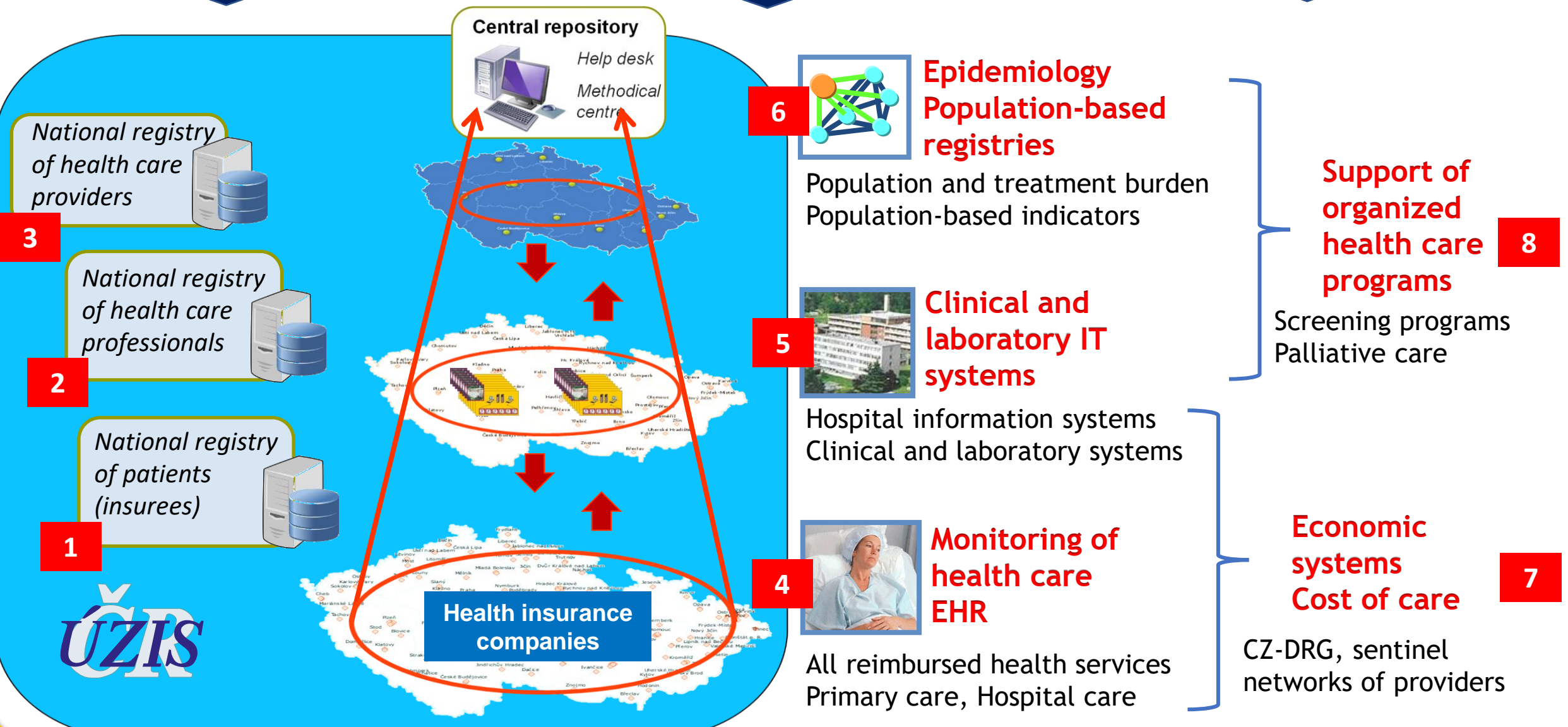
Successful system? -> complex coverage of all segments of care



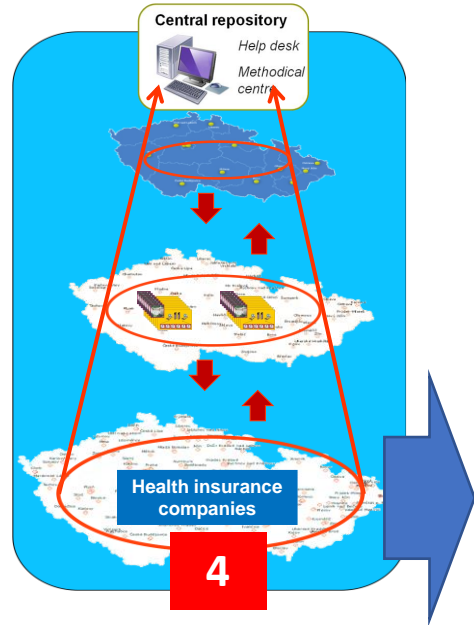
REFERENCE E-HEALTH DATA SPACE

INTEGRATED HEALTH CARE SYSTEMS

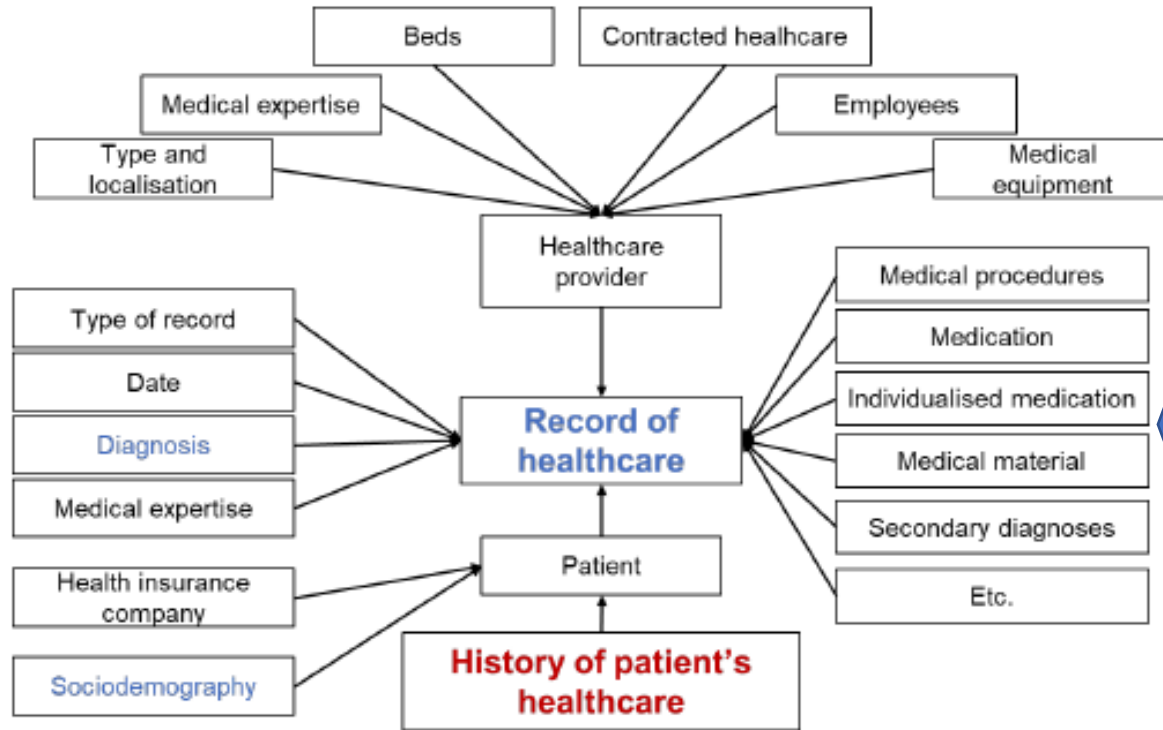
SPECIAL SYSTEMS FOR HEALTH CARE PROGRAMS



Key (high volume) component: The registry of all reimbursed health care services



Full centralization
of data of health
care payers



Year	Administered care (procedures, drugs, etc.)	Unique patients
2010	784 310 890	10 421 267
2011	789 265 885	10 472 704
2012	791 155 251	10 422 625
2013	818 172 692	10 442 772
2014	850 798 615	10 486 511
2015	981 389 090	10 512 790
2016	1 001 561 133	10 577 032
2017	1 016 619 794	10 610 900
2018	1 038 552 817	10 680 876
2019	1 085 826 827	10 760 256
2020	1 074 565 406	10 682 356
2021	1 154 277 090	10 801 319

Time-related individualized parametric data records

Diagnostics



Therapy



Supportive care



Palliative
care

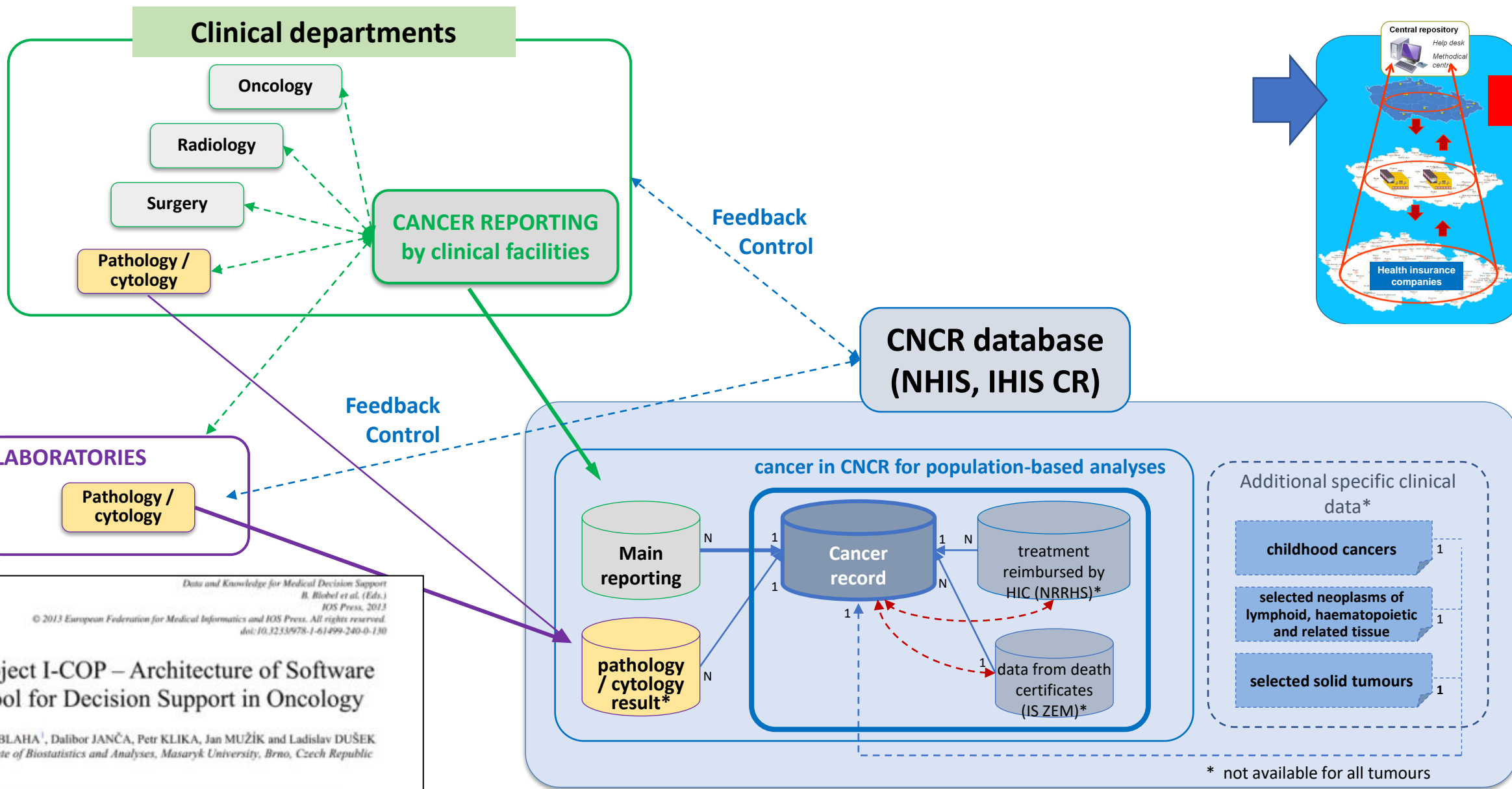
Organized, population-based cancer screening program

needs

**Representative analyses of cancer
epidemiology in target population**



Centralized population-based registry: automated data flow



130 *Data and Knowledge for Medical Decision Support*
 B. Blobel et al. (Eds.)
 IOS Press, 2013
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 doi:10.3233/978-1-61499-240-0-130

Project I-COP – Architecture of Software Tool for Decision Support in Oncology

Milan BLAHA¹, Dalibor JANČA, Petr KLIKA, Jan MUŽÍK and Ladislav DUŠEK
 Institute of Biostatistics and Analyses, Masaryk University, Brno, Czech Republic

Abstract: This article briefly describes the development of the I-COP tool, which is designed to promote education and decision making of clinical oncologists. It is based on real data from medical facilities, which are processed, stored in database, analyzed and finally displayed in an interactive software application. Used data sources are shortly described in individual sections together with the functionality

Examples of reporting generated by the Czech National Cancer Control System: Population level

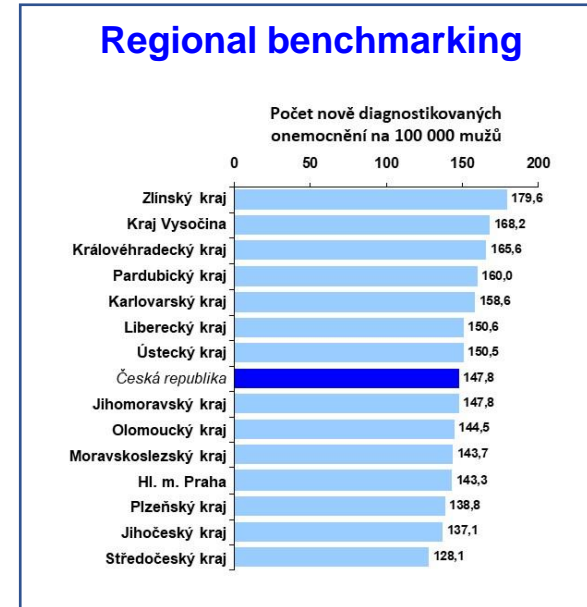
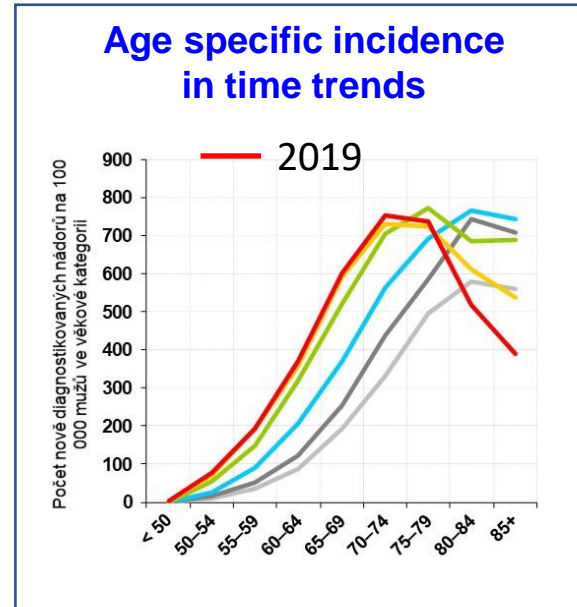
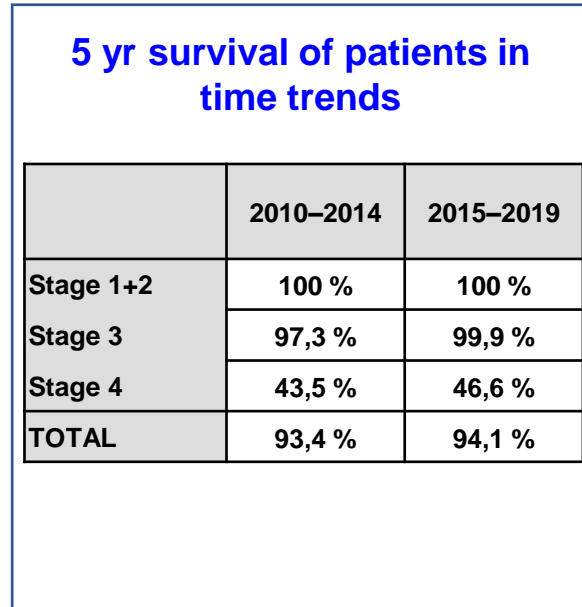
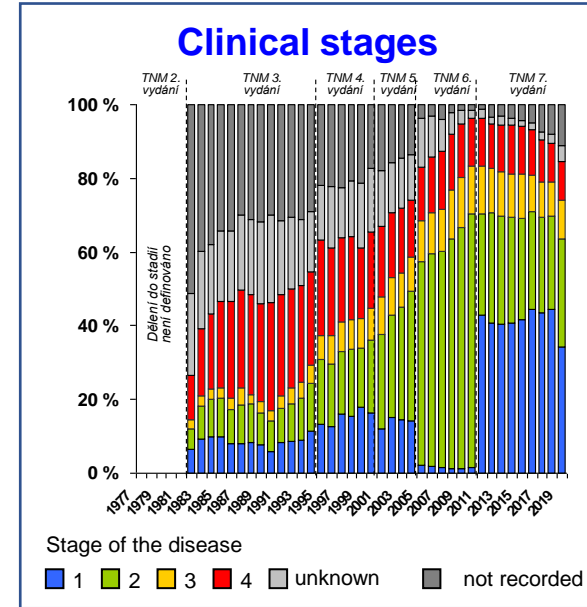
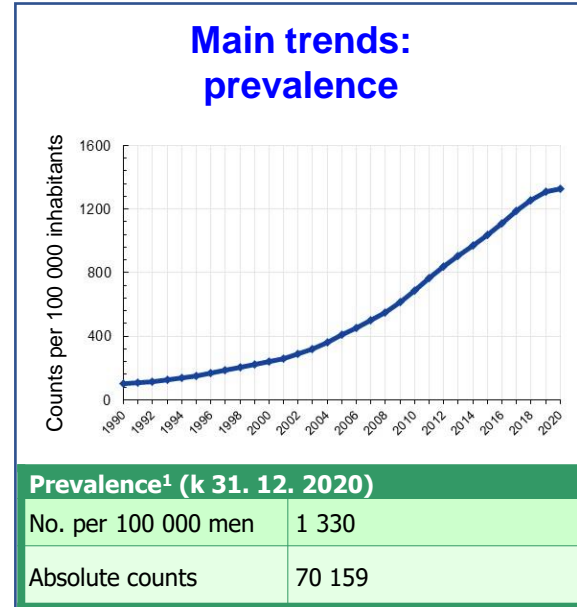
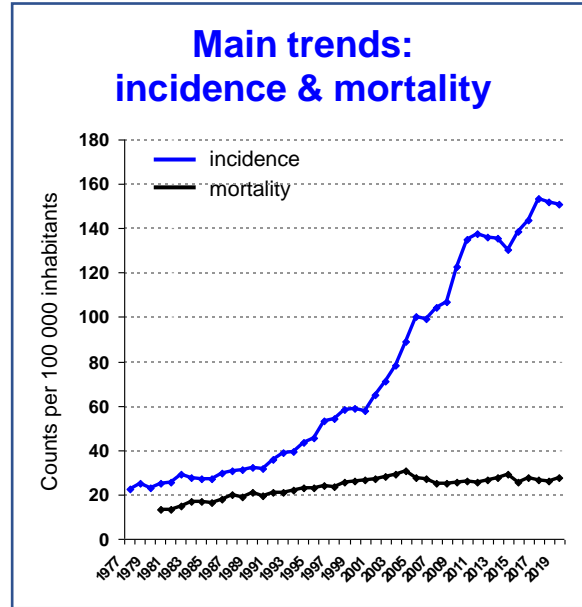
Model of prostate cancer (C61)

Stages	Predicted incidence 2022	
	Incidence	(90% CL)
Stage I+II	5 132	(4 680; 5 585)
Stage III	643	(587; 699)
Stage IV	817	(727; 907)
TOTAL	7 566	(6 754; 8 377)

Stages	Predicted prevalence 2022	
	Prevalence	(90% CL)
Stage I+II	60 460	(60 056; 60 864)
Stage III	9 152	(8 995; 9 309)
Stage IV	5 676	(5 552; 5 800)
TOTAL	81 434	(80 965; 81 903)



Some highly organized program of early detection is needed (Van Poppel, H. et al. European urology vol. 79,3 (2021): 327-329)



Data sharing model: population-based on-line reporting

http://www.cba.muni.cz - SVOD analýza - Microsoft Internet Explorer

INCIDENCE A MORTALITA - vývoj v čase

Zvolte požadovanou diagnózu

VIII. NÁDORY UROGENITÁLNÍHO SYSTÉMU

C60 - ZN pyje
C61 - ZN předstojné žlázy - prostaty
C62 - ZN semenná vajíčka

Zobrazit kategorie diagnóz

http://www.cba.muni.cz - SVOD analýza - Microsoft Internet Explorer

INCIDENCE A MORTALITA - vývoj v čase

Výběr skupiny pacientů

Pohlaví, věk Region Období
Stádium TNM klasifikace Další parametry

Časový vývoj

C64 - ZN ledviný ním pánevičku - Incidence

Počet případů na 100 000 osob

Zdroj dat: ÚZIS ČR

http://www.cba.muni.cz/svod

http://www.cba.muni.cz - SVOD analýza - Microsoft Internet Explorer

REGIONÁLNÍ PŘEHLEDY

Výběr skupiny pacientů

Pohlaví, věk Region Období
Stádium TNM klasifikace Další parametry

Časový vývoj

C64 - ZN ledviný ním pánevičku - Incidence

regionální přehled dle přepočtu na 100 000 osob za období 1977-2002

18,0 - 20,2
15,9 - 18,0
13,8 - 15,9
11,7 - 13,8

12.6, 11.7, 14.3, 14.6, 17.4, 14.9, 16.7, 15.9, 14.2, 19.7, 14.3, 13.5

Zobrazit mapu Zobrazit

Změnit diagnózu Nastavení analýzy

Hotovo

C20 - ZN konečníku - recta

vývoj zastoupení stadií

100%
80%
60%
40%
20%
0%

neuvedeno **
neznámo *
Stadium 4
Stadium 3
Stadium 2
Stadium 1

analýzovaná data: N=49161 zdroj dat: ÚZIS ČR

uroweb.cz

Kidney cancer Bladder cancer Prostate cancer Testicular cancer General overview

Epidemiology and population-based data CZ International epidemiology data Regional reporting CZ Prediction of number of treated patients Diagnostics and early detection Therapeutic procedures and standards Monitoring of results and quality of care Projects, analyses, and publications

Project description
Analyses and publications
Data sources and clinical registries
Data sources and registries CZ
International data sources
Evidence-based medicine
Library of chemotherapy regimens
Research projects
Urological cancers facilities
Information links
Contacts

Epidemiology and population-based data CZ

Intro page for each diagnosis – selection of epidemiological analyses

- TIME TRENDS OF INCIDENCE AND MORTALITY
- TIME TRENDS OF PREVALENCE
- AGE STRUCTURE OF DIAGNOSED AND DECEASED PATIENTS
- AGE-SPECIFIC INCIDENCE AND MORTALITY
- INCIDENCE AND MORTALITY IN REGIONS
- PROPORTION OF CLINICAL STAGES
- STAGE-SPECIFIC TRENDS OF INCIDENCE
- TUMOURS MORPHOLOGY – OVERVIEW

C20 - ZN konečníku - recta - incidence

Počet případů ve věkové kategorii

10000
8000
6000
4000
2000
0

0-4 5-9 10-14 15-19 20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-74 75-79 80-84 85+

analýzovaná data: N=56141 http://www.rektum.cz zdroj dat: ÚZIS ČR

www.svod.cz

www.uroweb.cz

Dušek L et al. Epidemiology of Malignant Tumours in the Czech Republic [online]. Czech Republic. ISSN 1802 – 8861.

Mužik J. et al Uroweb: portal of epidemiology, diagnostics and treatment of urological cancers. ISSN 1804-6371

Organized, population-based cancer screening program

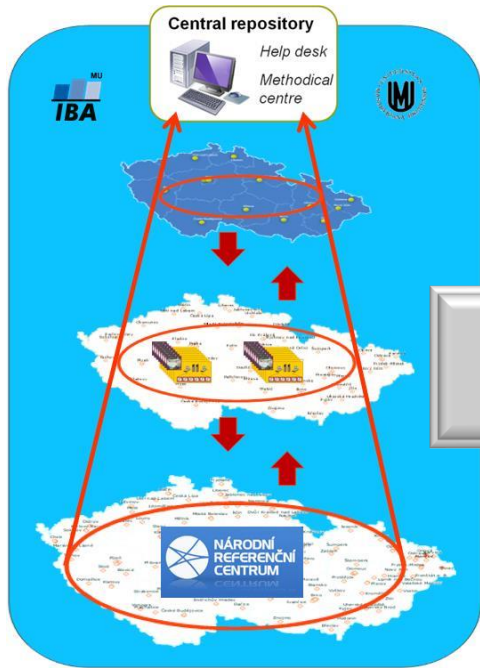
needs

**Control of activity and outcomes
of health care providers, pathway
of patients in the system**



National cancer control information system: Hospital level

Population cancer registry

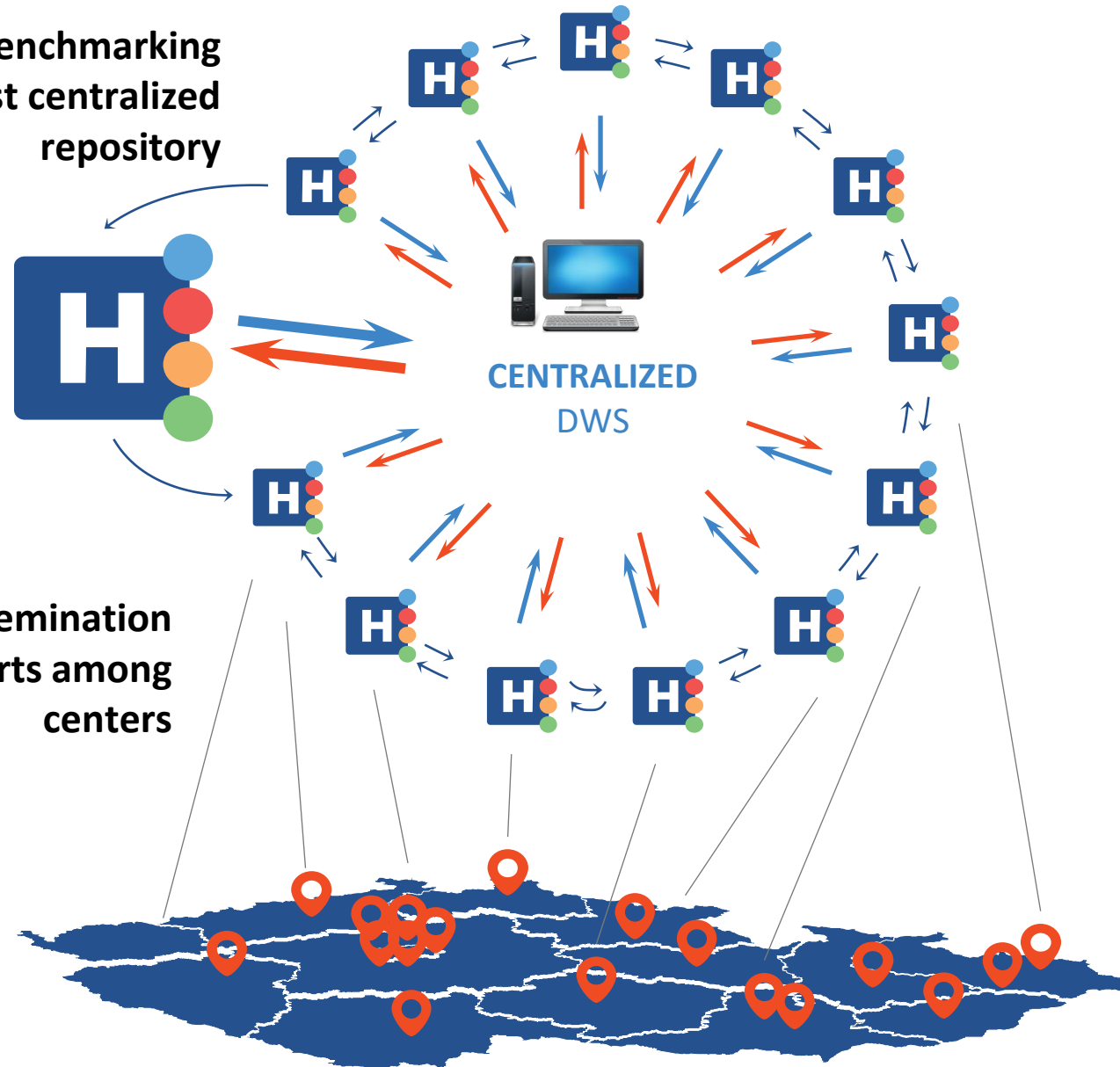


Interlinked clinical information systems

Integrated disease management programs

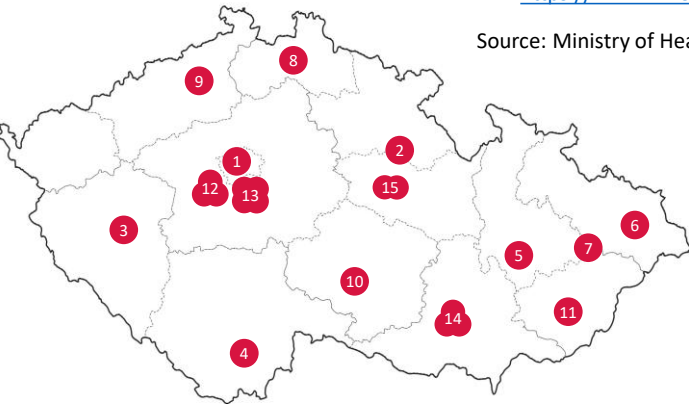
Self – benchmarking against centralized repository

Dissemination of reports among centers



Examples of reporting generated by the Czech National Cancer Control System: **Hospital level**

Networking of CCCs Regional CCCNs



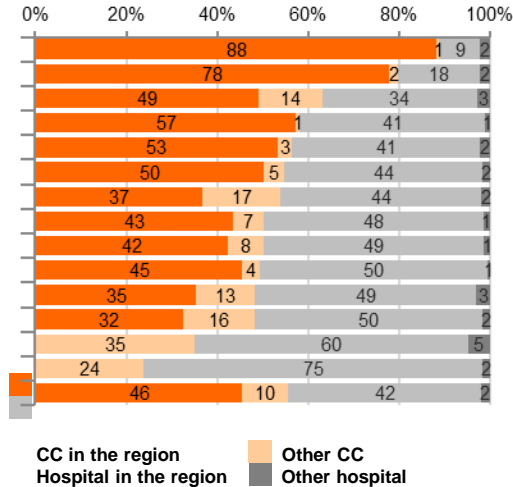
Updated according to
<https://www.linkos.cz>

Source: Ministry of Health

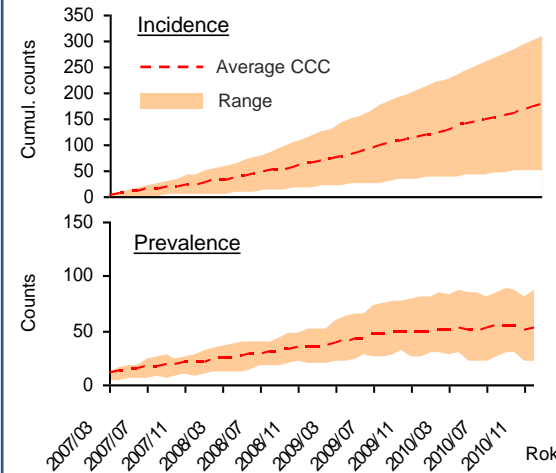
www.onconet.cz

www.linkos.cz

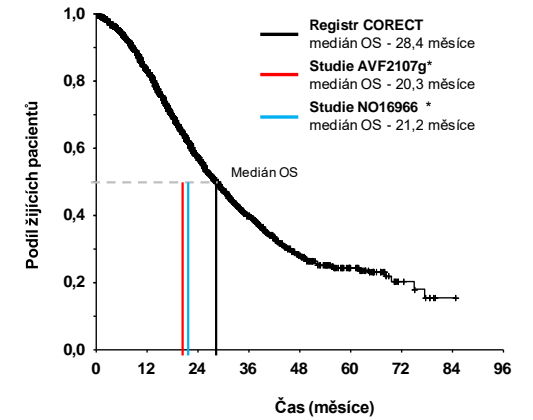
Distribution of care among regions/centers



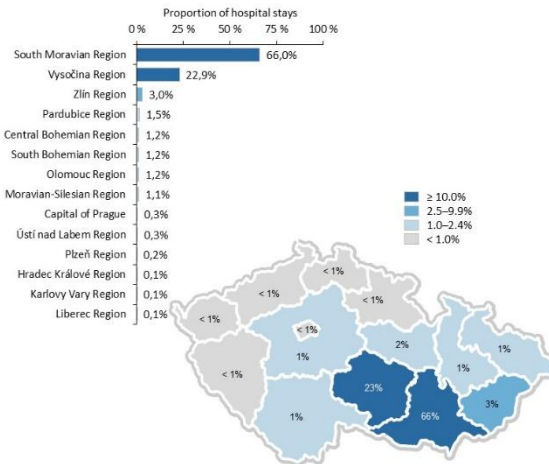
Volume of care: capacity benchmarking



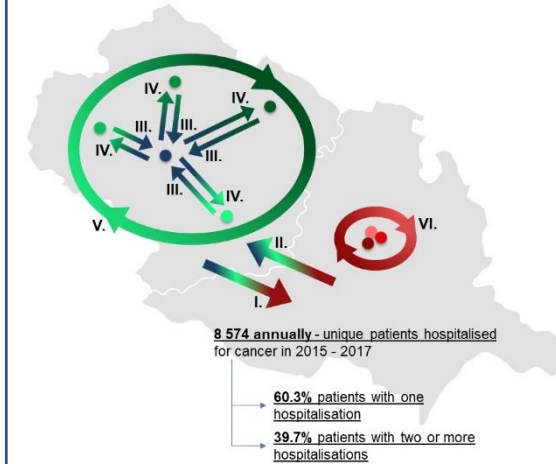
Benchmarking of survival after given medication



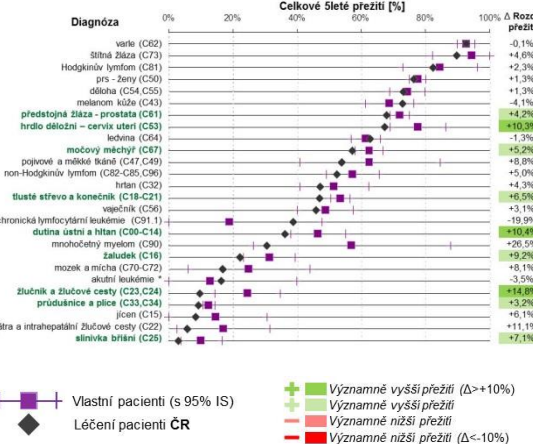
Catchment area of centers and hospitals



Trajectories - patient's pathways



Outcome measures: 5yr survival - benchmarking



Data sharing model: support for cancer care organization

www.onconet.cz

www.linkos.cz

<http://nrpzs.uzis.cz>

NATIONAL CANCER CONTROL PROGRAMME
ISSN 1802-887X

comprehensive cancer care national cancer control programme data and background information

South Moravian Region

Type of health care facility

- Constituent parts of CCCs [n=3]
- Children's cancer centres [n=1]
- Haemato-oncology centres [n=1]
- Facilities cooperating with CCCs [n=16]
- Mammography screening centres [n=8]
- Colonoscopy screening centres [n=19]
- LCTHs and hospices [n=10]
- Display all [N=58]

Map of all health facilities providing cancer care in this region

Diagram of cancer care in this region:

Diagram of cancer care in this region

Cancer Centres in this region:

Comprehensive Cancer Centre of Masaryk Memorial Cancer Institute in cooperation with University Hospital Brno and St. Anne's University Hospital in Brno

News from the region

9.10.2014 Description of cancer care in the South Moravian Region
Cancer care is provided by CCC of Masaryk Memorial Cancer Institute Brno in cooperation with University Hospital Brno and St. Anne's University Hospital.

Map of facilities involved in comprehensive cancer care

Types and numbers of facilities

Diagram of cancer care

Link to a regional Cancer Centre

Regional news

Detail of a health care facility

Comprehensive Cancer Centre of Masaryk Memorial Cancer Institute in cooperation with University Hospital Brno and St. Anne's University Hospital in Brno

Basic characteristics

Total number of beds available for cancer patients: 230
Total number of oncology outpatient departments: 24

Medical equipment:

- Spiral computed tomography: 1
- MRI: 1
- PET: 1
- Classical mammography machine: 1
- Digital mammography machine: 1
- Endoscopic ultrasound: 1

Comprehensive Cancer Centre of Masaryk Memorial Cancer Institute in cooperation with University Hospital Brno and St. Anne's University Hospital in Brno

Clinical trials and implementation of new procedures

The centre has a total clinical conviction at its disposal: []
The centre is willing and has the capacity to take part in new multicentre clinical trials and registries: []

Number of clinical trials being conducted in compliance with the Good Clinical Practice) in which the centre currently participates:

Phase I: Total number: 1
Number of international projects: 1

Phase II: Total number: 23
Number of international projects: 21

Phase III: Total number: 1
Number of international projects: 1

The centre is involved in Czech or international clinical registries:

Project: Identification of project organizers: Diagnosis of registered patients: since: The centre has been actively participating in the registry since:

Registry: Prof. MUDr. Rostislav Vysloužil, CSc., MD
CIS: C18-20, C25, C34, C46, C54, C56, C58, C44

The centre actively participates in prevention programmes:

Primary prevention: esophageal screening, colorectal carcinoma, Shd II Out, counselling service on healthy diet and lifestyle
Secondary prevention: esophageal screening, colorectal carcinoma, melanoma treatment, seniors

The centre organizes its own projects of a nationwide significance in the following areas:

Diagnoses pathology: []
radiodiagnosis: []
nuclear medicine: []
Therapy: chemotherapy: []
radiation therapy: []
biological therapy: []
Genomics and proteomics: []
Pharmacogenetics: []

Dušek L. et al. Comprehensive Cancer Care Network – a model [online], Masaryk University, 2017 [cit.15. 02. 2018]. Available from WWW: <http://ccn.onconet.cz>. 2018 | created by IBA FM MU

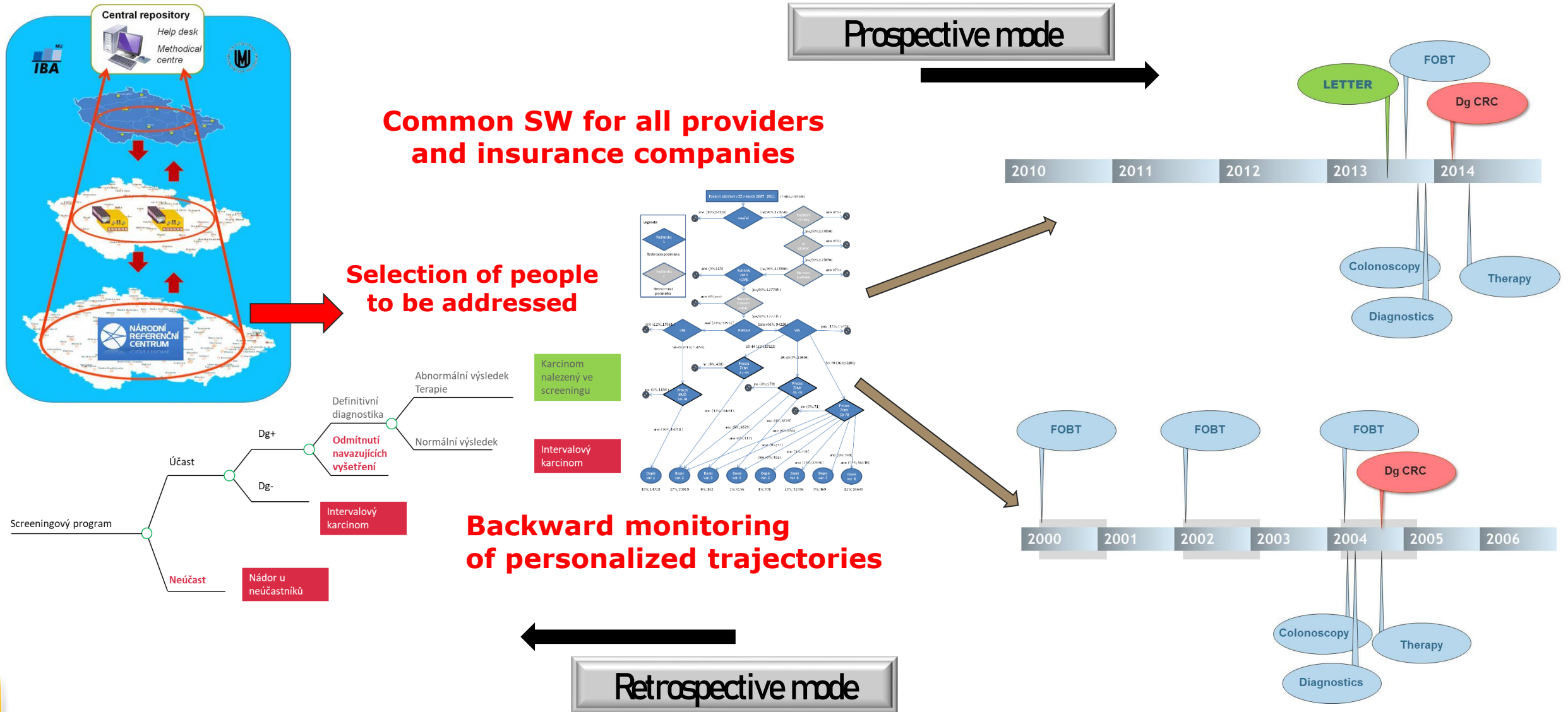
Organized, population-based cancer screening program

needs

**Control over screening process,
its coverage, diagnostic accuracy, safety,
efficacy ... outcomes**



System for management and evaluation of organized screening





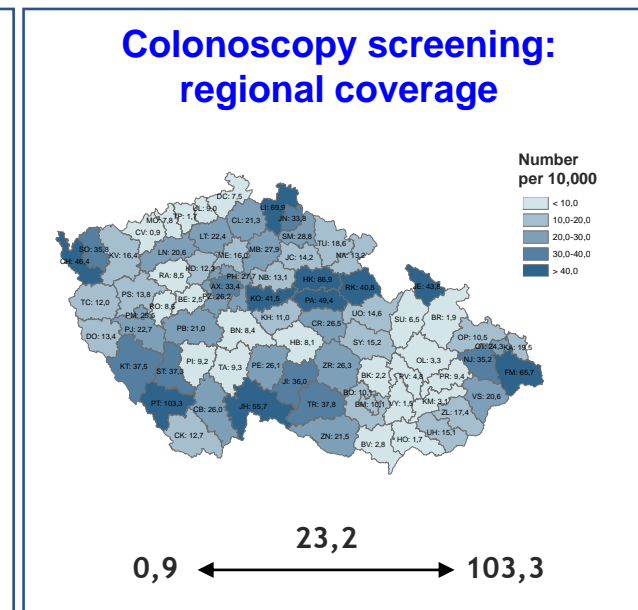
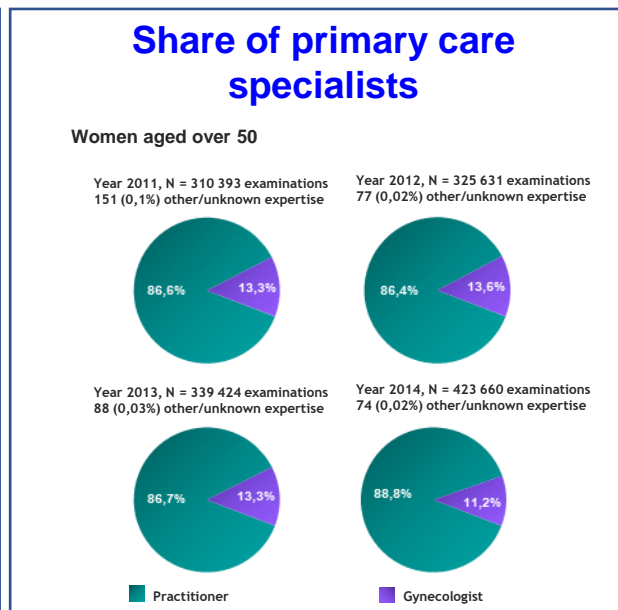
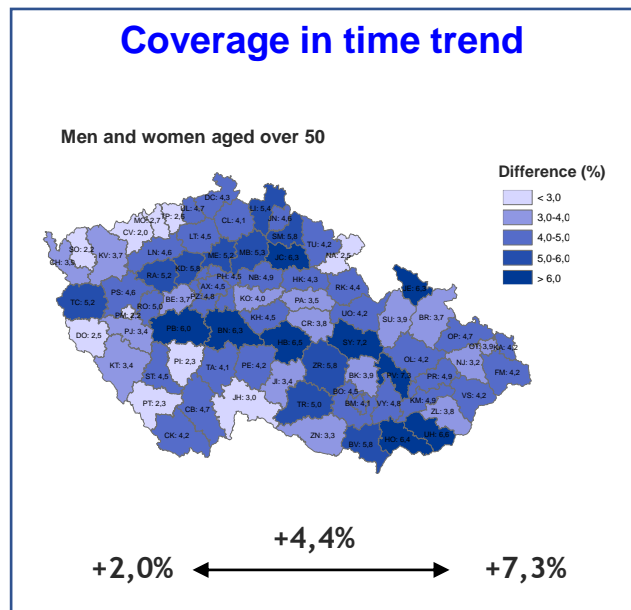
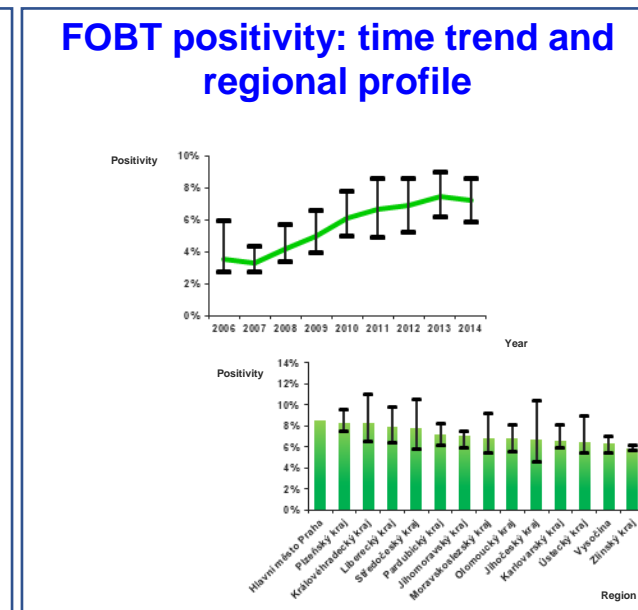
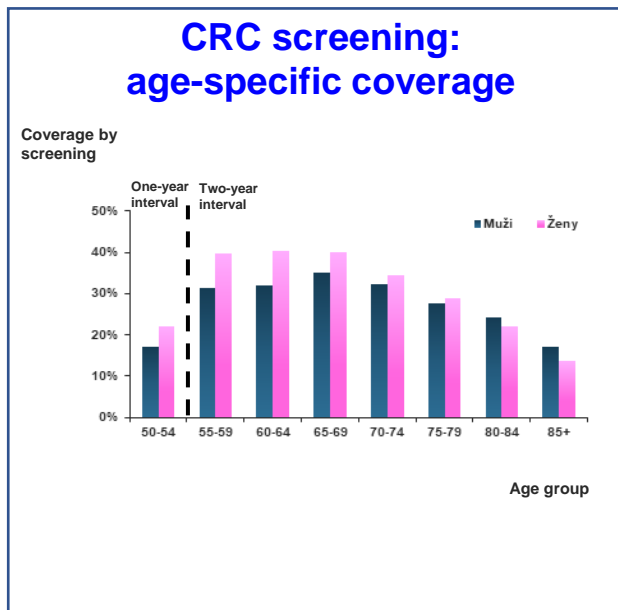
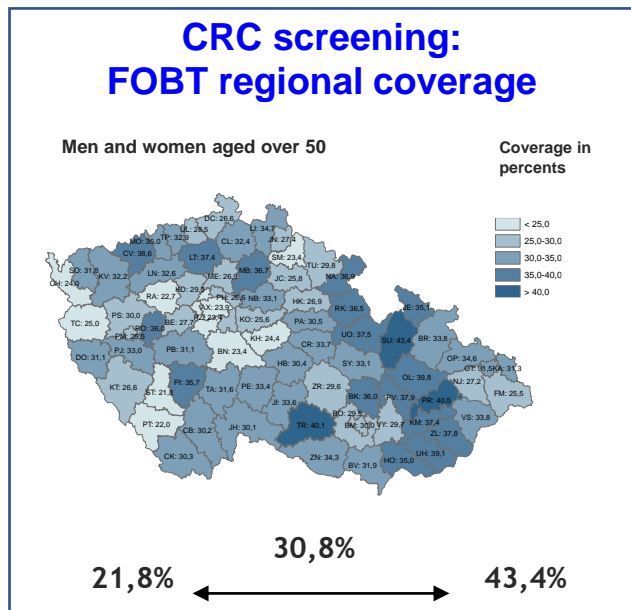
<https://nsc.uzis.cz>

www.mamo.cz

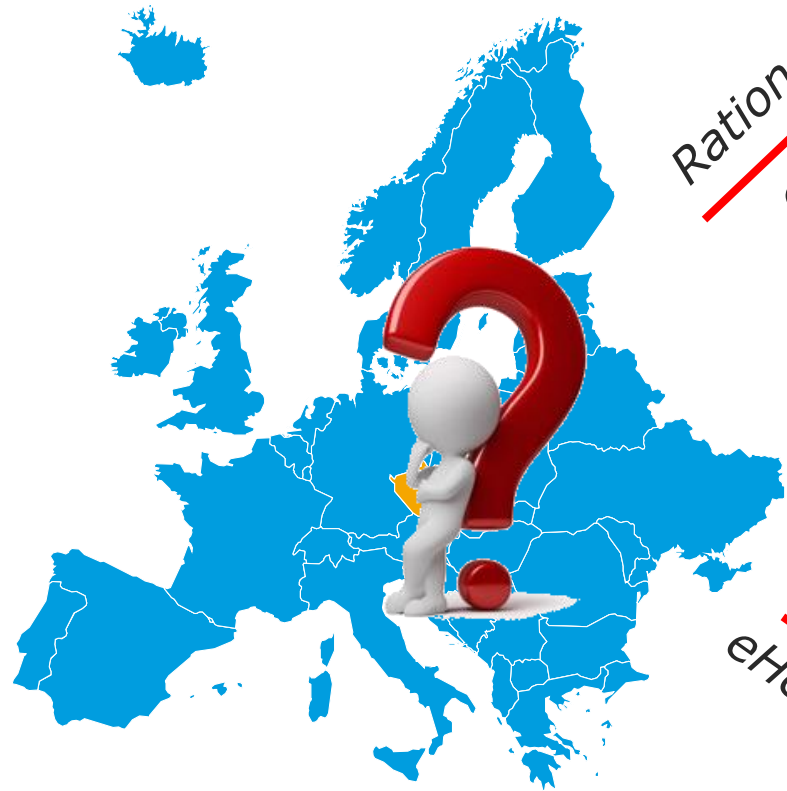
www.kolorektum.cz

www.cervix.cz

Model diagnosis: colorectal cancer



Current challenges



*Rationale for prostate
cancer screening*

Epidemiology – population burden –
potential effect of screening – feasibility
– readiness of health care system

*Design of
new program*

Diagnostic & therapeutic
& follow-up guidelines

*Reimbursement
eHealth standards*

Management & control – data collection
standards - endpoints

Thank you for your kind attention