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# POPULATION PILOT PROGRAMME FOR PROSTATE CANCER EARLY DETECTION IN THE CZECH REPUBLIC: SITUATION ANALYSIS AND PLANNED DESIGN

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MINISTRY OF HEALTH  
OF THE CZECH REPUBLIC

[nsc.uzis.cz](http://nsc.uzis.cz)

23. 6. 2023



# COUNCIL RECOMMENDATION ON STRENGTHENING PREVENTION THROUGH EARLY DETECTION: A NEW EU APPROACH ON CANCER SCREENING REPLACING COUNCIL RECOMMENDATION 2003/878/EC

## Prostate cancer

Considering the preliminary evidence and the significant amount of ongoing opportunistic screening, countries should consider a stepwise approach, including piloting and further research, to evaluate the feasibility and effectiveness of the implementation of organised programmes<sup>10</sup> aimed at ensuring appropriate management and quality on the basis of prostate-specific antigen (PSA) testing for men, in combination with additional magnetic resonance imaging (MRI) scanning as a follow-up test.

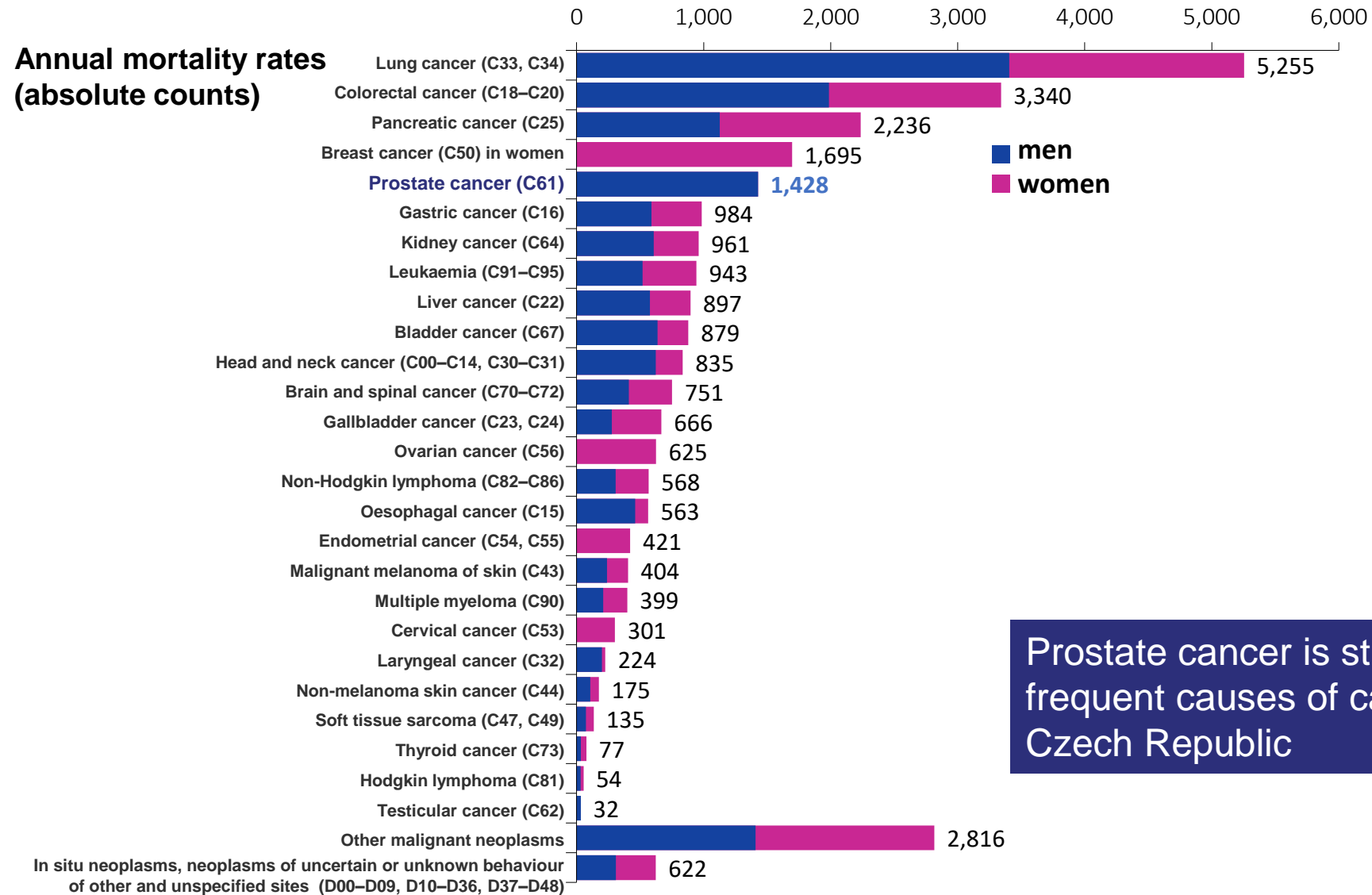
<sup>10</sup> <https://sapea.info/wp-content/uploads/cancer-screening-workshop-report-01.pdf>



## SCIENTIFIC JUSTIFICATION FOR PROSTATE CANCER SCREENING

- good evidence that prostate cancer screening with PSA testing can **reduce deaths from prostate cancer**
- **overdiagnosis and overtreatment are major harms** in prostate cancer screening, due to the high sensitivity of PSA testing
- imposing an **upper age limit** on screening (possibly around 65–69), and/or a **high-quality MRI scan** or other accurate additional testing for PSA-positive men, will **reduce overdiagnosis** and improve the harm-to-benefit ratio
- **opportunistic, unorganised PSA testing currently leads to insufficient use in younger men and overdiagnosis in older men**
- recent evaluations suggest that **there are cost-effective strategies** for population-based prostate cancer screening

# CANCER MORTALITY IN THE CZECH REPUBLIC IN 2017–2021

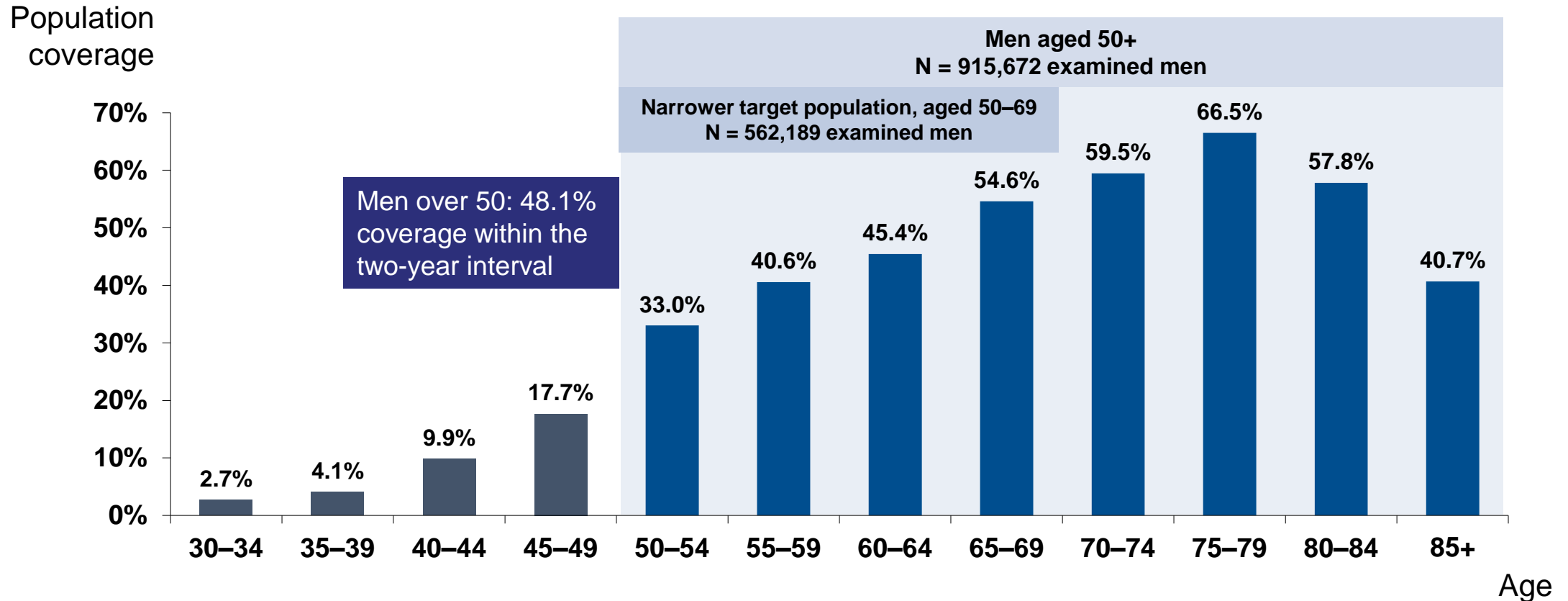


Source:  
Czech Statistical Office

Prostate cancer is still one of the most frequent causes of cancer deaths in the Czech Republic

# HALF OF MEN 50+ IN THE CZECH REPUBLIC ALREADY UNDERGO PSA TESTING

PSA examination (93225)  
(2020–2021, men over 30, N = 1,067,199)  
Source: NRRHS, UZIS



The coverage of the target population aged 30 and over in 2021 reaches 29.8% within the two-year interval, increasing substantially from the 50-54 age group and reaching the highest values in the 75-79 age group (66.5%). Coverage of the target population aged 50 and over in 2021 is 48.1% within the two-year interval.

## AVERAGE NUMBER OF PSA EXAMINATIONS IN 2019–2021 BY AGE

Age	2020–2021	2019–2021
30–34	1.15	1.21
35–39	1.18	1.26
40–44	1.25	1.39
45–49	1.31	1.49
50–54	1.38	1.61
55–59	1.55	1.87
60–64	1.75	2.18
65–69	1.96	2.50
70–74	2.13	2.81
75–79	2.25	3.00
80–84	2.21	2.92
85+	2.06	2.64
<b>Total 30+</b>	<b>1.79</b>	<b>2.23</b>
<b>Total 50+</b>	<b>1.88</b>	<b>2.38</b>

PSA examination (93225)  
(2019–2021, men aged over 30)  
Source: NRRHS, UZIS

**Average number in individuals  
undergoing PSA**

# PREPARATORY STEPS FOR THE NEW PROSTATE CANCER EARLY DETECTION PROGRAMME IN THE CZECH REPUBLIC

Preparatory work started in 2022

- Multi-stakeholder engagement: [roundtable](#) (2022) and the formal [Committee for Preparation of the Prostate Cancer Early Detection Programme](#) (2023)
- Small scale [pilot project](#) concluded
  - Process characteristics in cancer survivors and in general population
- Analysis of [situation and potential impact](#) of the organised programme
- Preparation of [strategy and implementation guidelines](#) for population pilot project



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National health information system analysis: prostate cancer burden and care

Planned screening strategy formulated

Small scale pilot project's result

Projected costs and outcomes

Implementation and monitoring guidelines

**Characteristics of the prostate cancer screening process in cancer survivors and in general population: prospective pilot study in the Czech Republic**

Marcela Koucká<sup>1,2</sup>, Kateřina Hejmanová<sup>1,2</sup>, Renata Chloupková<sup>1,2</sup>, Marek Dabjak<sup>1</sup>, Roman Záruba<sup>1</sup>, Ondřej Nývlt<sup>1,2</sup>, Karel Hrybík<sup>1,2</sup>, Luboš Janiš<sup>1,2</sup>, Ondřej Mlýsek<sup>1,2</sup>

**Introduction**

Prostate cancer is still one of the most frequent causes of cancer deaths in Czechia. The average age at diagnosis is 70 years, with a rising incidence of prostate-specific antigen (PSA) screening, which is more than 100 per 100,000 men. In 2022, 1,224 men died of OAD malignancies, which is 28.0 per 100,000 men. Incidence has been increasing for a long time, and the mortality trend is rather stable with a slight increase in recent years. 18% of prostate cancers were advanced and tumour primary cancers. The stage distribution is very similar to the first primary prostate cancer.

**Methodology**

The implementation of the pilot project was carried out by the implementation team of the National Screening Centre and the Working Group under the expert guarantee of representatives of professional societies. Larger population and screening process: Average age 50-70 were approached for the project. Informed without prostate cancer. Control arm: the cancer survivors arm; and arm in prior prostate cancer history. Based on the PSA result, the physician decided on further testing. Our aim was to estimate characteristics of the prostate cancer early detection process in both risk categories.

**Results**

A total of 304 men were examined in arms A: 157 (51.6%) had a PSA level of PSA according to the project criteria. All of them (100%) were examined by a urologist. Positive result of the prostate biopsy was confirmed in 5 patients. Control arm: 157 men (51.6%) were recommended to be included for a planned PSA level > 3 ng/ml. Control arm B included 150 men with a mean age of 60 years. Based on screening result, 173 men (11.5%) were recommended to be included for a planned PSA level > 3 ng/ml. Most men were advised to have a follow-up after 2 years (31.7%) or 4 years (10.5%).

**Conclusion**

Similar proportion of positive results between (0-20%) was observed in both arms. Current evidence supports potential expansion of targeted prostate cancer detection in the general male population. The pilot project provided characteristics of the screening process in the Czech population, which will be used to inform decisions about potential universal large-scale pilot programme in the Czech Republic.

See more at [www.euroscreening.eu](https://www.euroscreening.eu)



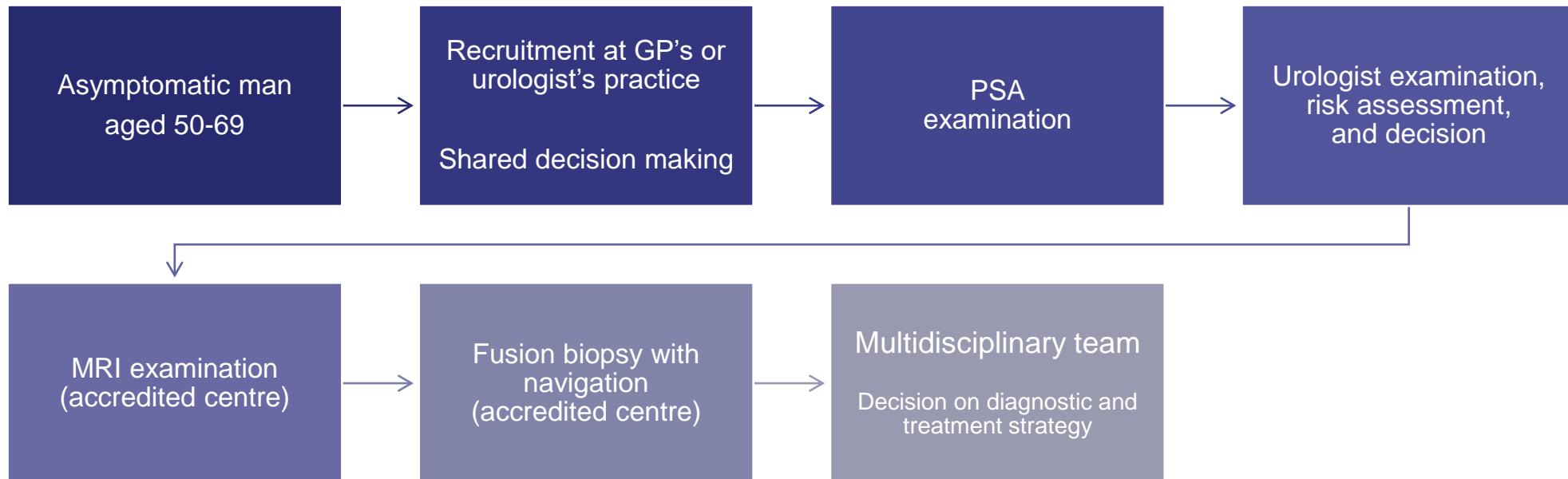
# PROPOSED CZECH POPULATION PILOT PROGRAMME FOR EARLY DETECTION OF PROSTATE CANCER: PROPOSED METHODOLOGY

- Potential launch of the programme
  - 2024
- Target population
  - men aged 50-69 years (+364 days) with no history of prostate cancer and no suspicion of prostate cancer
- Screening test
  - PSA examination
- Governance and coordination
  - Committee for Preparation of the Prostate Cancer Early Detection Programme
- Monitoring and evaluation
  - National Screening Centre, Institute of Health Information and Statistics of the Czech Republic

# PROPOSED CZECH POPULATION PILOT PROGRAMME FOR EARLY DETECTION OF PROSTATE CANCER: SIMPLIFIED PATIENT PATHWAY

## ■ Process

- GPs or urologists offers the programme, educate the patients, take sample for PSA examination
- urologists perform complex examination and potentially refer the patient for MRI examination
- MRI is provided only at **radiological departments accredited by the Ministry of Health**
- fusion biopsy is provided only at **urological departments accredited by the Ministry of Health**



# PROPOSED CZECH POPULATION PILOT PROGRAMME FOR EARLY DETECTION OF PROSTATE CANCER: SCREENING TEST AND REFERRAL TO UROLOGIST

GP  
or urologist (dispensary care)



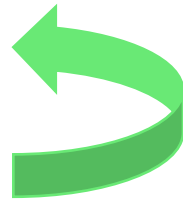
**Asymptomatic man<sup>1</sup>**



**Entry criteria**

- age 50–69<sup>2</sup> years
- no medical history of C61
- no suspicion of C61
- no PSA test in the last 2 years
- GP does not enroll men in dispensary care by urologist

**Client instruction**



**Refusal to participate**  
Repeated addressing in 2 years

**Participation**



PSA < 1  
(- -)



PSA in 4 years



PSA 1–3  
(-)



PSA in 2 years



PSA > 3  
(+)

OR

suspicious DRE  
(examination by urologist)



<sup>1</sup>In case of symptoms, the diagnostic process is carried out according to professional recommendations

<sup>2</sup>Follow the same schedule for men aged >70 yr with good performance status and life expectancy of at least 10–15 yr

Van Poppel H, Hogenhout R, Albers P, van den Bergh RC, Barentsz JO, Roobol MJ. Early detection of prostate cancer in 2020 and beyond: facts and recommendations for the European Union and the European Commission. Screening. 2021 Mar 1;73:56.

## Urologist – examination and risk assessment

- US of the prostate (abdominal or TRUS)
- Repeat total PSA testing
- PSAD
- PSA velocity
- DRE

# ESTIMATED PROSTATE CANCER DETECTION COSTS: CURRENT SITUATION (ANNUAL COSTS, 2021)

## Estimation methodology (real-world practice according to reimbursement data, 2021)

- PSA test, prostate biopsy: *all procedures*
- Examination by a urologist, ultrasound, multidisciplinary team: *procedures in men with PSA*
- MRI examinations: *procedures indicated by urologist or associated examinations*
- Pathology examinations: *following biopsy procedures by a urologists*
- **Men with previous prostate cancer diagnosis not included**

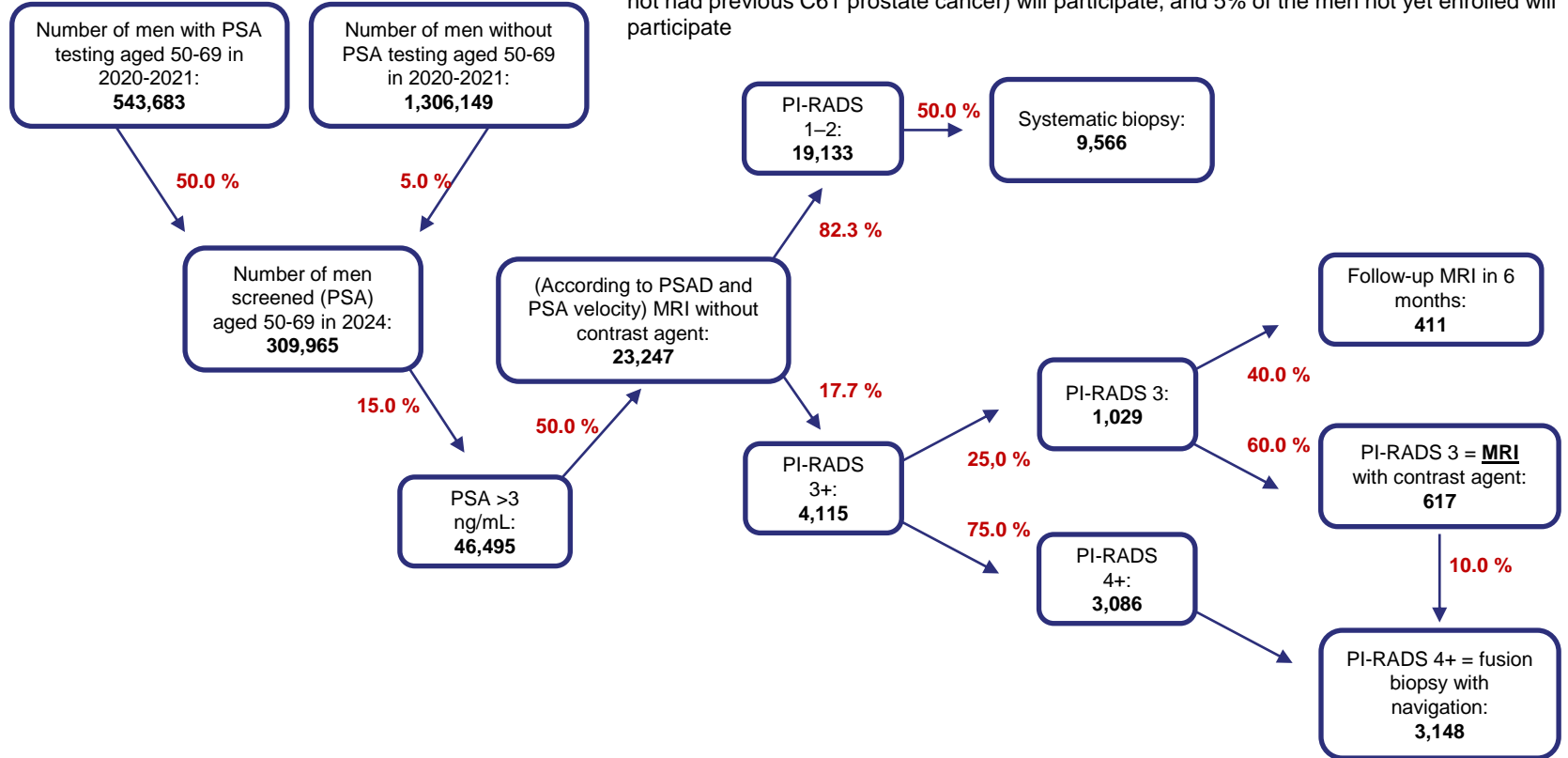
## Key results

Examination	Number of examinations	Annual costs (thousand EUR)	Number of examinations	Annual costs (thousand EUR)	Number of examinations	Annual costs (thousand EUR)
	Men aged 50–69 years		Men aged 70+ years		Men aged under 50 years	
<b>PSA tests</b>	479,215	4,445	319,144	2,960	116,126	1,077
...						
<b>Total annual costs (thousand EUR)</b>		<b>17,314</b>		<b>13,746</b>		<b>2,957</b>

assumed 1 EUR = 24 CZK

# MODELLED PROCESS AND ANNUAL COSTS FOR THE ORGANISED PROGRAMME (EXAMPLE OF BASELINE SCENARIO)

It is assumed, given the proposed interval of 2 years, that half of the men already enrolled (who have not had previous C61 prostate cancer) will participate, and 5% of the men not yet enrolled will participate



Specialisation	Total costs (thousand EUR)
GP	3,576
PSA	3,893
Urologist/MDT	6,271
MRI examination	3,834
Pathology	3,519
<b>Total</b>	<b>21,092</b>

The results represent the indicative costs obtained through the mathematical model. The overall analytical output also includes a detailed breakdown of costs by individual health interventions and a sensitivity analysis of the input assumptions.

## ESTIMATED COSTS COMPARISON OF CURRENT SITUATION AND PROPOSED PROGRAMME: SUMMARY OF INDICATIVE RESULTS

- **Currently**, in the group of older men, contrary to the recommendations, there is a very intensive PSA testing. The cost to the health system for **PSA testing and related care** (including possible diagnosis and dispensing of prostate disease) can be **estimated at approximately 17 million EUR for men aged 50-69 years and almost 14 million EUR for older men.**
- Under the baseline scenario, **the modelled cost of the proposed programme algorithm is 21 million** (annual cost in the 50-69 age group).
- The results represent the indicative costs obtained through the mathematical model. The overall analytical output also includes a detailed breakdown of costs by individual health interventions and a sensitivity analysis of the input assumptions.

# PROSTATE CANCER SCREENING IS PROPOSED AS A 5YEAR POPULATION PILOT PROGRAMME

## Why is it still important to learn? (i.e. embed research into the pilot)

- To gain experience with feasibility and acceptability
- To identify the characteristics of the screening process in the Czech context (completing the HTA assessment)
  - Inclusion of new men vs. elimination of non-programme screening
  - Positivity, negative/positive predictive value, detection rate
  - Participation rate in complementary testing and therapy (compliance)
  - Determination of economic characteristics (cost per disease captured, cost-effectiveness, budget impact)
- To collect data for possible further optimisation of the screening process
  - Targeting or stratification of screening

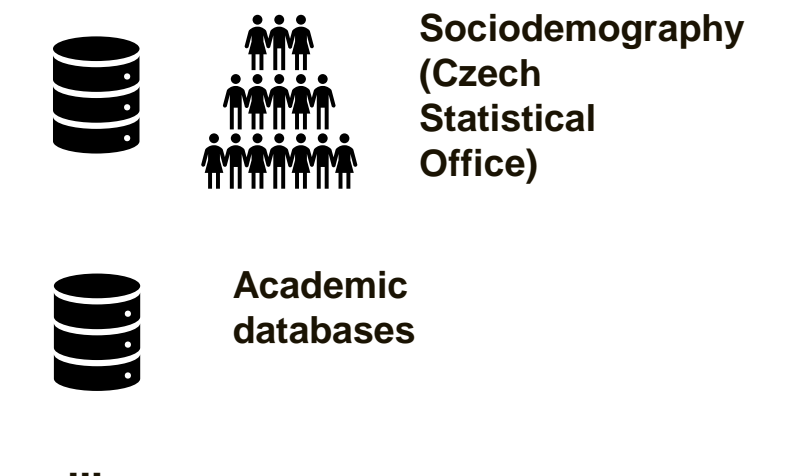
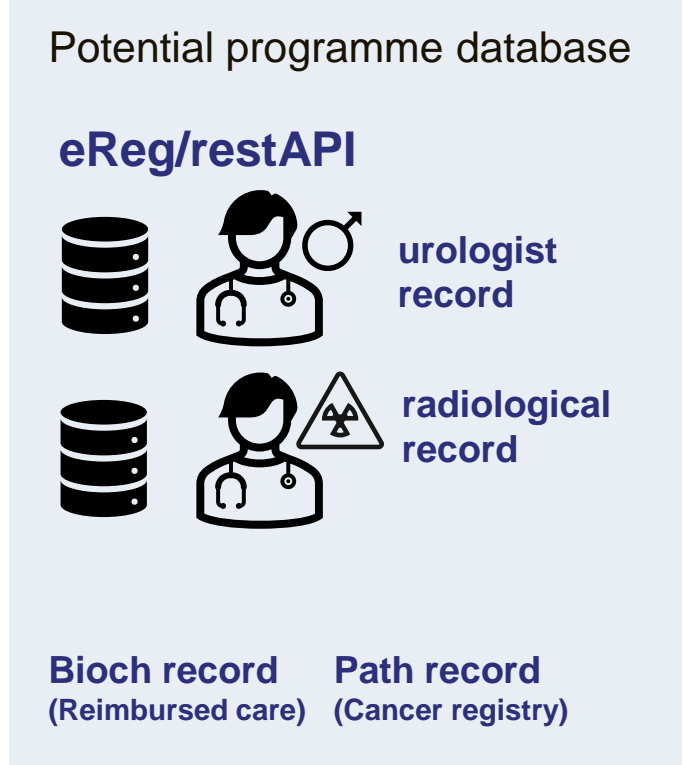
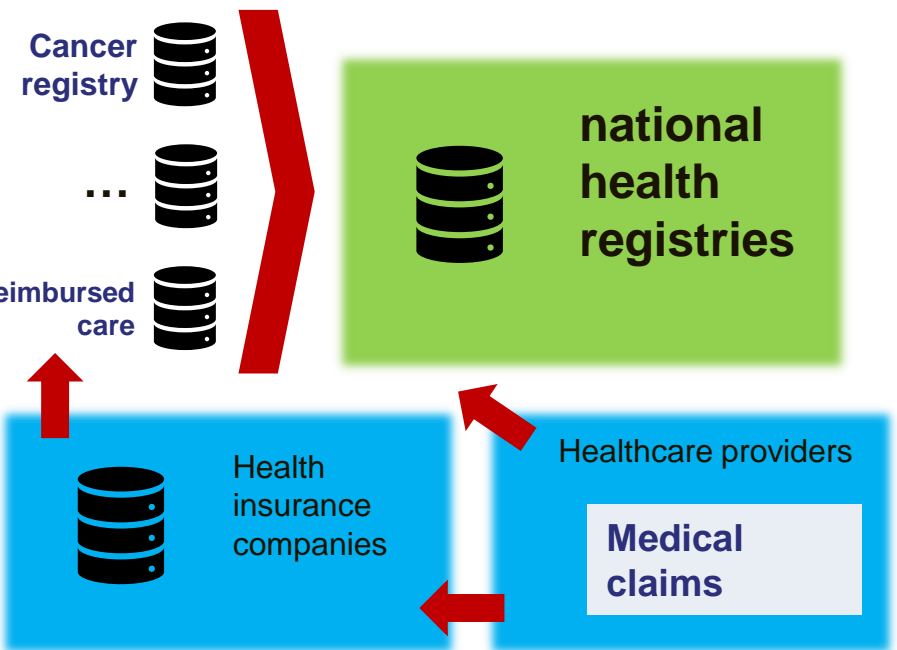
# COMPREHENSIVE INFORMATION SYSTEM TO CONTROL THE PROGRAMME

## Quality assurance information system

### NSC/UZIS data collections

### External sources

#### National Health Information System





## PROPOSED SET OF KEY PERFORMANCE INDICATORS

1. Percentage of men agreeing to be included in the programme
2. Percentage of men with an abnormal PSA result
3. Participation rate of men with an abnormal result in urological examination
4. Participation rate of men in bpMRI examination
5. Proportion of indeterminate MRI results (PI-RADS 3)
6. Participation rate of men with indeterminate MRI results (PI-RADS 3) in repeat MRI examinations
7. Proportion of men with a positive MRI scan undergoing fusion biopsy
8. Proportion of men undergoing systematic biopsy, by MRI result
9. Proportion of patients with a positive biopsy result undergoing multidisciplinary assessment at the highly specialized cancer/urooncology centre
10. Prostate cancer detection rate, by Gleason score (especially 3+4+, 4+3+)
11. Time intervals between events
12. Completeness of the data record

## CONCLUSIONS

- Prostate cancer is still a **serious health problem** in the Czech Republic, being the third most frequent cancer cause of death.
- Organised prostate cancer screening is **potentially effective tool to decrease mortality** from prostate cancer
- Current **highly prevalent opportunistic screening** is likely **inefficient**, and the need for organisation of the care is therefore warranted.
- The consensus guidelines for an organised programme are currently being finalised and approved, with **expected start of the population pilot project from 2024**.



<https://prostaforum.uzis.cz/en/prague-prostaforum-declaration/>

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journal homepage: [www.eu-openscience.europeanurology.com](http://www.eu-openscience.europeanurology.com)

**EAU**  
European Association of Urology



### Brief Correspondence

## How to follow the new EU Council recommendation and improve prostate cancer early detection: the Prostaforum 2022 declaration

Ondřej Májek<sup>a,b,\*</sup>, Marek Babjuk<sup>c</sup>, Monique J. Roobol<sup>d</sup>, Ola Bratt<sup>e,f</sup>, Hendrik Van Poppel<sup>g,h</sup>, Roman Zachoval<sup>i</sup>, Jiří Ferda<sup>j</sup>, Marcela Koudelková<sup>a,b</sup>, Ondřej Ngo<sup>a,b</sup>, Jakub Gregor<sup>a,b</sup>, Sarah Collen<sup>g</sup>, Karel Hejduk<sup>a,b</sup>, Ladislav Dušek<sup>a,b</sup>, Vlastimil Válek<sup>b,k</sup>



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# THANK YOU FOR YOUR ATTENTION!

THANKS TO  
NUMEROUS  
COLLABORATORS  
AND STAKEHOLDERS



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