Practical challenges in establishing and running the Czech national colorectal cancer screening programme

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Czech National CRC Screening Program current design

• target population
  – age ≥ 50 (4.0 million people)
  – asymptomatic, no personal or family history of colorectal neoplasia (adenoma, CRC)

screening program design

– age 50 – 54
  • FIT annually

– age ≥ 55
  • FIT biannually
  • screening colonoscopy
Czech National CRC Screening Program development

• 2000 – 2013: opportunistic program
  – GPs and gynecologists
    • gFOBT / screening colonoscopy

• 2014: population-based program
  – personal invitation (CRC, breast and cervical cancer)
  – gFOBT completely replaced by FIT
    • higher sensitivity, higher compliance
Czech population-based program
combination of two approaches

1. GPs and gynecologists regular check-up

2. Mail invitation to non-attendees
   - health insurance database control
   - NO colonoscopy ≤ 5 years or NO FOBT ≤ 3 years
Czech population-based program results

INCREASE OF:

1. Target population coverage
2. Screening methods performed
3. Colorectal neoplasia detection
Increas of target population coverage in Czech republic

Total coverage (men and women age > 50)

Source: Health Insurance Companies
Increase of screening methods

Number of people with screening method in different years

- **Two-years intervals**

<table>
<thead>
<tr>
<th>Year</th>
<th>FOBT</th>
<th>Colonoscopy (diagnostic and screening)</th>
<th>Endoscopic polypectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>1 600 000</td>
<td>200 000</td>
<td>500 000</td>
</tr>
<tr>
<td>2002-03</td>
<td>1 400 000</td>
<td>300 000</td>
<td>700 000</td>
</tr>
<tr>
<td>2004-05</td>
<td>1 200 000</td>
<td>400 000</td>
<td>900 000</td>
</tr>
<tr>
<td>2006-07</td>
<td>1 000 000</td>
<td>500 000</td>
<td>1 100 000</td>
</tr>
<tr>
<td>2008-09</td>
<td>800 000</td>
<td>600 000</td>
<td>1 300 000</td>
</tr>
<tr>
<td>2010-11</td>
<td>600 000</td>
<td>700 000</td>
<td>1 500 000</td>
</tr>
<tr>
<td>2012-13</td>
<td>400 000</td>
<td>800 000</td>
<td>1 700 000</td>
</tr>
<tr>
<td>2014-15</td>
<td>200 000</td>
<td>900 000</td>
<td>1 900 000</td>
</tr>
</tbody>
</table>

**Population-based program FIT dominance**

- **2012-13**: 1 416 706
- **2014-15**: 527 459
- **2014-15**: 119 671

Personal invitation in 2014-2015 (men and women age 50-70) → increase

**Source:** Health Insurance Companies
## FIT+ / screening colonoscopies
### Increase of colorectal neoplasia detection

<table>
<thead>
<tr>
<th>Year</th>
<th>Colonoscopy</th>
<th>Adenoma</th>
<th>Proportion</th>
<th>Carcinoma</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>5 320</td>
<td>1 575</td>
<td>29,6%</td>
<td>335</td>
<td>6,3%</td>
</tr>
<tr>
<td>2007</td>
<td>5 676</td>
<td>1 636</td>
<td>28,8%</td>
<td>337</td>
<td>5,9%</td>
</tr>
<tr>
<td>2008</td>
<td>7 457</td>
<td>2 368</td>
<td>31,8%</td>
<td>445</td>
<td>6,0%</td>
</tr>
<tr>
<td>2009</td>
<td>13 072</td>
<td>4 125</td>
<td>31,6%</td>
<td>622</td>
<td>4,8%</td>
</tr>
<tr>
<td>2010</td>
<td>22 728</td>
<td>7 310</td>
<td>32,2%</td>
<td>871</td>
<td>3,8%</td>
</tr>
<tr>
<td>2011</td>
<td>24 708</td>
<td>8 301</td>
<td>33,6%</td>
<td>776</td>
<td>3,1%</td>
</tr>
<tr>
<td>2012</td>
<td>25 630</td>
<td>8 947</td>
<td>34,9%</td>
<td>812</td>
<td>3,2%</td>
</tr>
<tr>
<td>2013</td>
<td>26 940</td>
<td>10 126</td>
<td>37,6%</td>
<td>867</td>
<td>3,2%</td>
</tr>
<tr>
<td>2014</td>
<td>38 128</td>
<td>14 416</td>
<td>37,8%</td>
<td>1 042</td>
<td>2,7%</td>
</tr>
<tr>
<td>2015</td>
<td>37 330</td>
<td>14 081</td>
<td>37,7%</td>
<td>969</td>
<td>2,6%</td>
</tr>
<tr>
<td>2016</td>
<td>37 939</td>
<td>13 696</td>
<td>36,1%</td>
<td>904</td>
<td>2,4%</td>
</tr>
<tr>
<td>2017*</td>
<td>2 576</td>
<td>838</td>
<td>32,5%</td>
<td>42</td>
<td>1,6%</td>
</tr>
<tr>
<td>Total</td>
<td>247 504</td>
<td>87 419</td>
<td>35,3%</td>
<td>8 022</td>
<td>3,2%</td>
</tr>
</tbody>
</table>

* results until March 2017

Source: Czech Preventive Colonoscopies Registry
Do we have effective screening?

Issues to solve:

• low target population coverage
• FOBT results variability
• unofficial screening („grey screening“)
• connection of screening registry with the National cancer registry
Target population coverage in the EU

- recommended
  45-65% of coverage

- Netherlands 68.2%
- Slovenia 60.4%
- ... 40 - 45%
- Czech republic 29.9%
- Croatia 19%

Source: Ponti A. Cancer Screening in the European Union report 2017
• significant variability of FOBT positivity in the regions
  – different types of FIT tests, cut-off, regions with different CRC incidence

Source: Health Insurance Companies
FIT in the Czech republic

- high tests heterogeneity
  - different cut-off levels (50-200 ng/ml)
  - different types of tests
    - qualitative, semiquantitative, quantitative

- missing transition to new units
  - $\mu \text{g Hb/g stool}$

- high false positivity

- higher waiting time to FIT+ colonoscopy

Navarro M, et al.  WJG 2017
# Waiting time to FOBT positive colonoscopy

<table>
<thead>
<tr>
<th>YEAR</th>
<th>No. FOBT positive colonoscopies</th>
<th>Waiting time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>5 316</td>
<td>0.82</td>
</tr>
<tr>
<td>2007</td>
<td>5 671</td>
<td>0.89</td>
</tr>
<tr>
<td>2008</td>
<td>7 446</td>
<td>0.90</td>
</tr>
<tr>
<td>2009</td>
<td>11 684</td>
<td>0.94</td>
</tr>
<tr>
<td>2010</td>
<td>18 323</td>
<td>1.12</td>
</tr>
<tr>
<td>2011</td>
<td>20 115</td>
<td>1.17</td>
</tr>
<tr>
<td>2012</td>
<td>21 127</td>
<td>1.17</td>
</tr>
<tr>
<td>2013</td>
<td>21 962</td>
<td>1.26</td>
</tr>
<tr>
<td>2014</td>
<td>28 786</td>
<td>1.55</td>
</tr>
<tr>
<td>2015</td>
<td>25 365</td>
<td>1.72</td>
</tr>
<tr>
<td>2016</td>
<td>26 497</td>
<td>1.68</td>
</tr>
</tbody>
</table>

*Source: Czech Preventive Colonoscopies Registry*
**Unofficial screening**

No. of people with examinations in different years

- **52% patients with NO FOBT-positive colonoscopy**
  - unofficial ("grey") screening

**POSSIBLE REASONS:**

- ↓ patients compliance to colonoscopy
- FOBT positive patients are examined on other endoscopy facilities

*Source: Health Insurance Companies*
Do we have effective screening?

Yes, but...

Source: National Cancer Registry
Efficacy of the CRC screening programme in the Czech republic

• direct evidence is missing

• individual data, link between registers is missing
  – Preventive Colonoscopies Registry
  – Health Insurance Companies
  – Czech national cancer registry

• indirect evidence
  – population epidemiologic data
Challenges to the future

• standardization of FIT tests
  – uniform cut-off at least at the regional level
  – transition to new units (μg Hb/g stool)
• continue with address invitations
• link the registers (screening, cancer and health insurance registers)
• minimize „grey“ screening - financial reimbursement of screening colonoscopies?
Conclusion

• the population-based screening program is associated with higher participation in CRC screening

• to achieve required participation 45% of target population it is needed to continue with address invitation and minimize the unofficial screening

• cut-off value of the FIT test must be adapted to each region, taking into account the availability of endoscopic resources

• according to the epidemiological data screening reduces not only mortality but also the incidence of CRC in the Czech republic, but there is a lack of direct evidence
Thank you for your attention