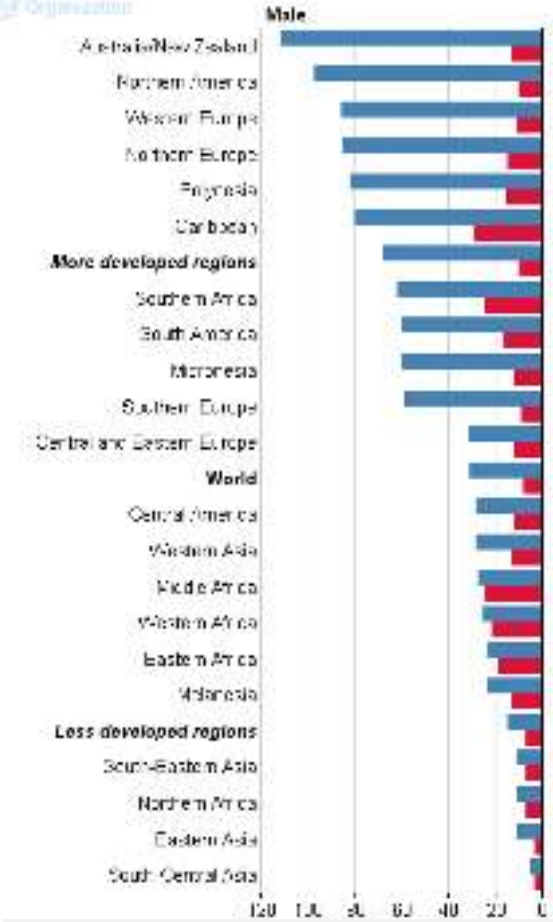
Prostate cancer screening in Kazakhstan

EURASIAN CANCER SCREENING CONFERENCE

Ishkinin Yevgeniy, PhD

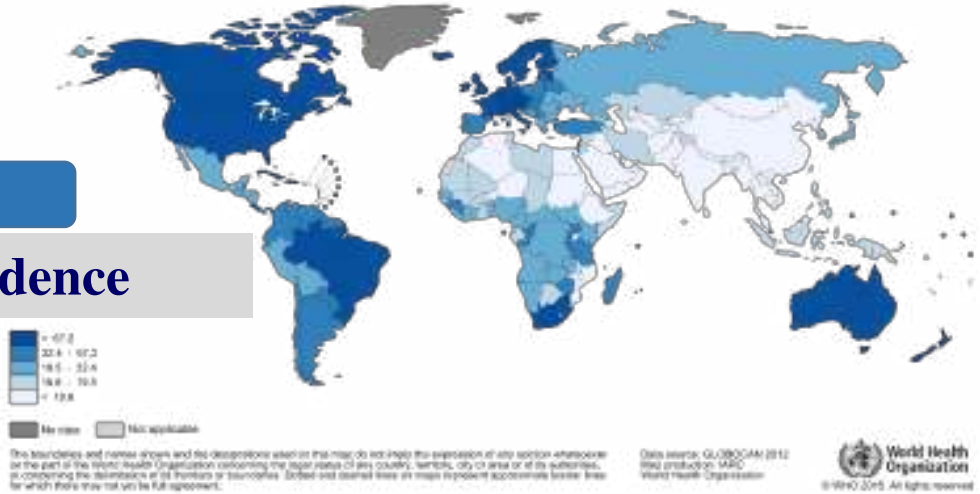
Kazakh Institute of oncology & radiology, Almaty

PCa epidemiology in 2012



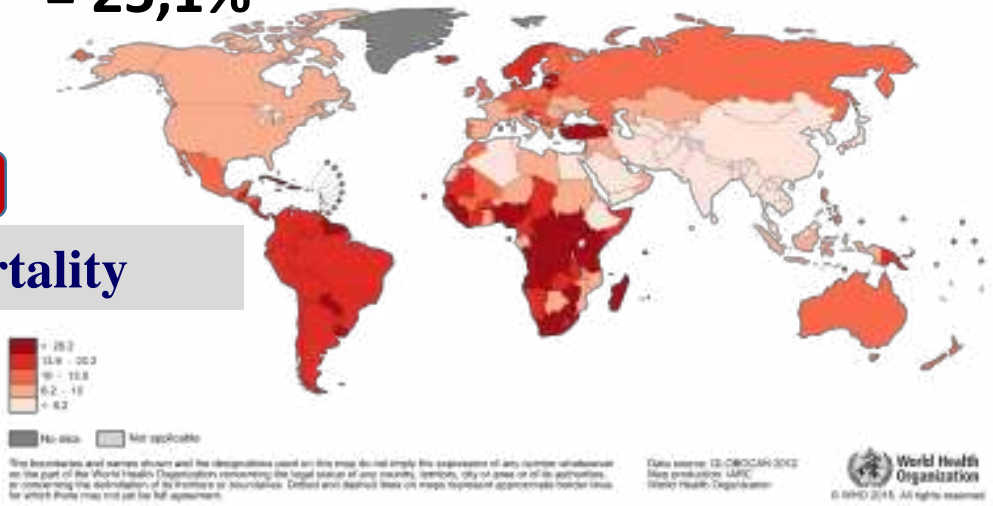
GLOBOCAN 2012 (IARC),
Section of Cancer Information (27/10/2017)

PCa incidence



$$\frac{\text{mortality}}{\text{incidence}} = 25{,}1\%$$

PCa mortality



Background PCa screening program in Kazakhstan, 2010

"Health Evidence Network (HEN) of the WHO Regional Office for Europe", May 2004

programs of mass screening of PCa should not be implemented at the national level. Policy makers at the national level should not support mass screening programs until they receive evidence of its effectiveness.

- Late incidence — III- IV stage 63,3 %
- Mortality / incidence — 53,7 %
- 1 year mortality — 22,1 %

канцеррегистр РК 2010г.

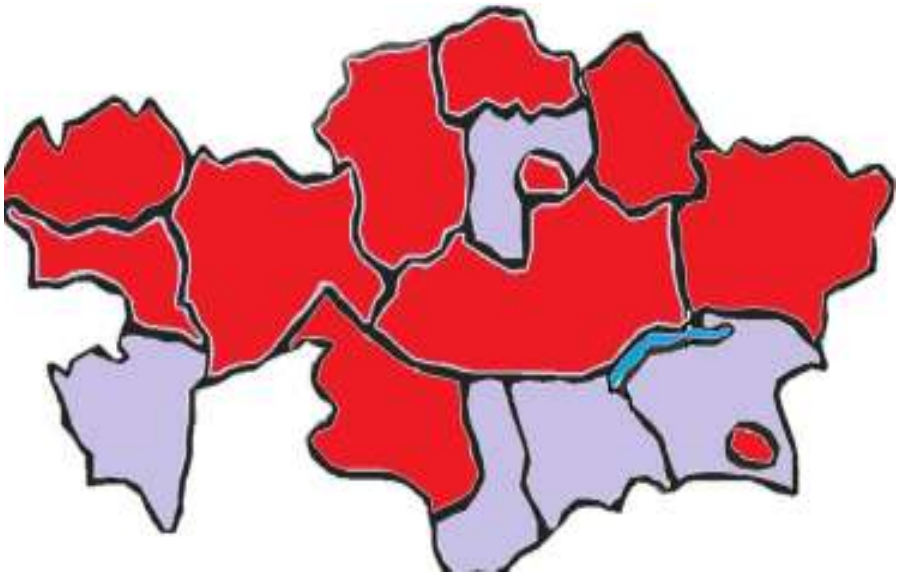
The program of development of cancer care in the Republic of Kazakhstan for 2012-2016, approved. Decree of the Government of the Republic of Kazakhstan of March 29, 2012 No. 366)

1. Improvement of the preventive orientation of the primary health care system. Activity No. 8: "Introduce step-by-step screening of malignant neoplasms, incl. PCa »

Algoritm of screening PCa in Kazakhstan

Core group without PCa **428 483**

pilot	78 007	132 651	110 879	106 946
2012	2013	2014	2015	2016
BKO	1-West Kazakhstan, 2- Kyzylorda, 3- Pavlodar, 4- Astana city 5- Almaty sity	6 – Actobe 7- Atirau 8- Karaganda 9- Kostanai 10-Notrh Kazakstan		



PSA detection (50-66 years)

- Low risk <4 (3.1) ng/ml → Repeat PSA 4 year
- Intermediate risk 4-10 (3.1-7.8) ng/ml → Free PSA -2proPSA PHI
- High risk >10 (7.8) ng/ml → TRUS patomorphology
  - «-» → Repeat PSA 1 ye
  - «+» → Treatment oncourology

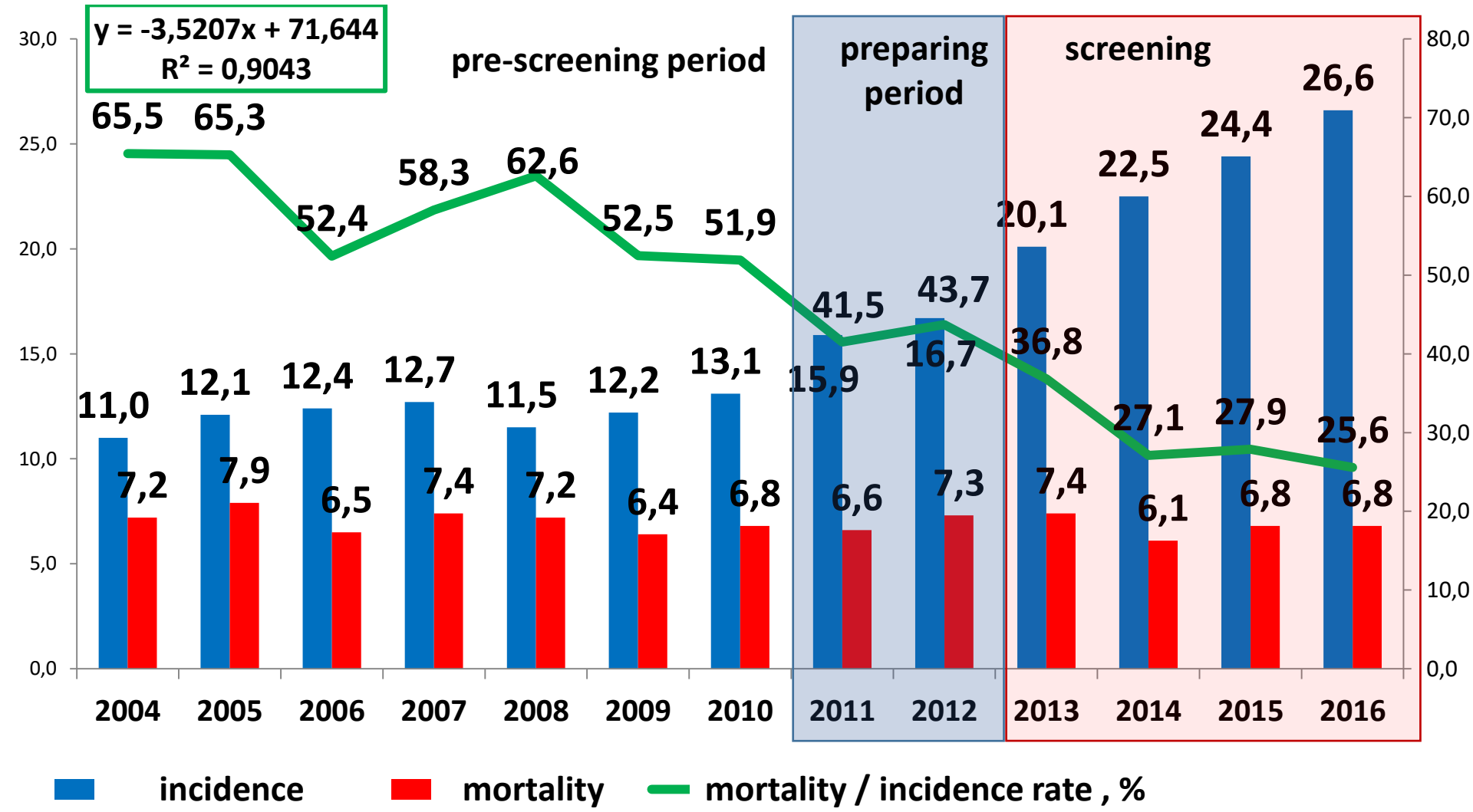
Intermediate risk 4-10 (3.1-7.8) ng/ml

50 | 54 | 58 | 62 | 66

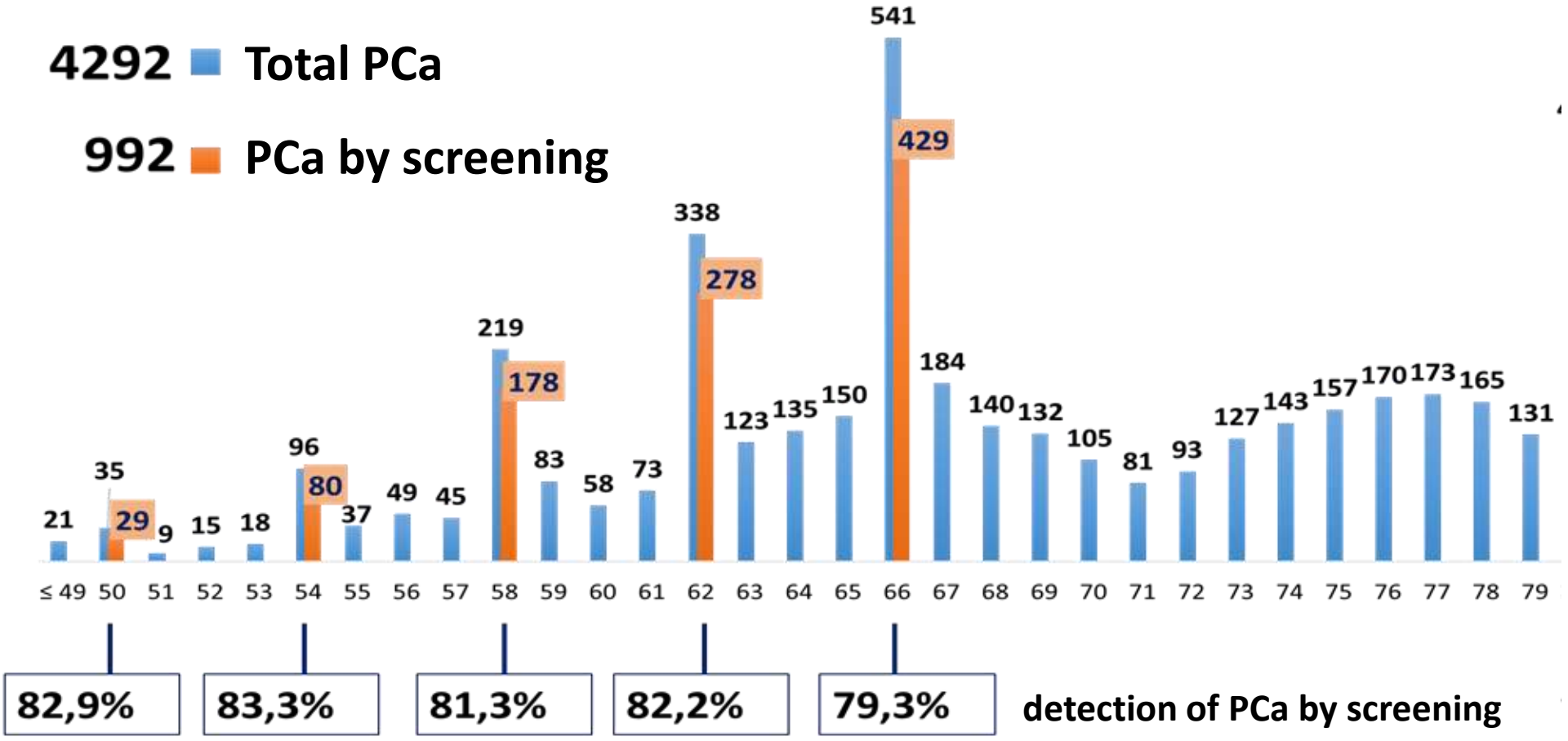
Free PSA, -2proPSA PHI

- < 25 examination not necessary → Low risk Repeat PSA 4 year
- > 25 examination is necessary → **High risk** Urologist control TRUS + biopsy patomorphology

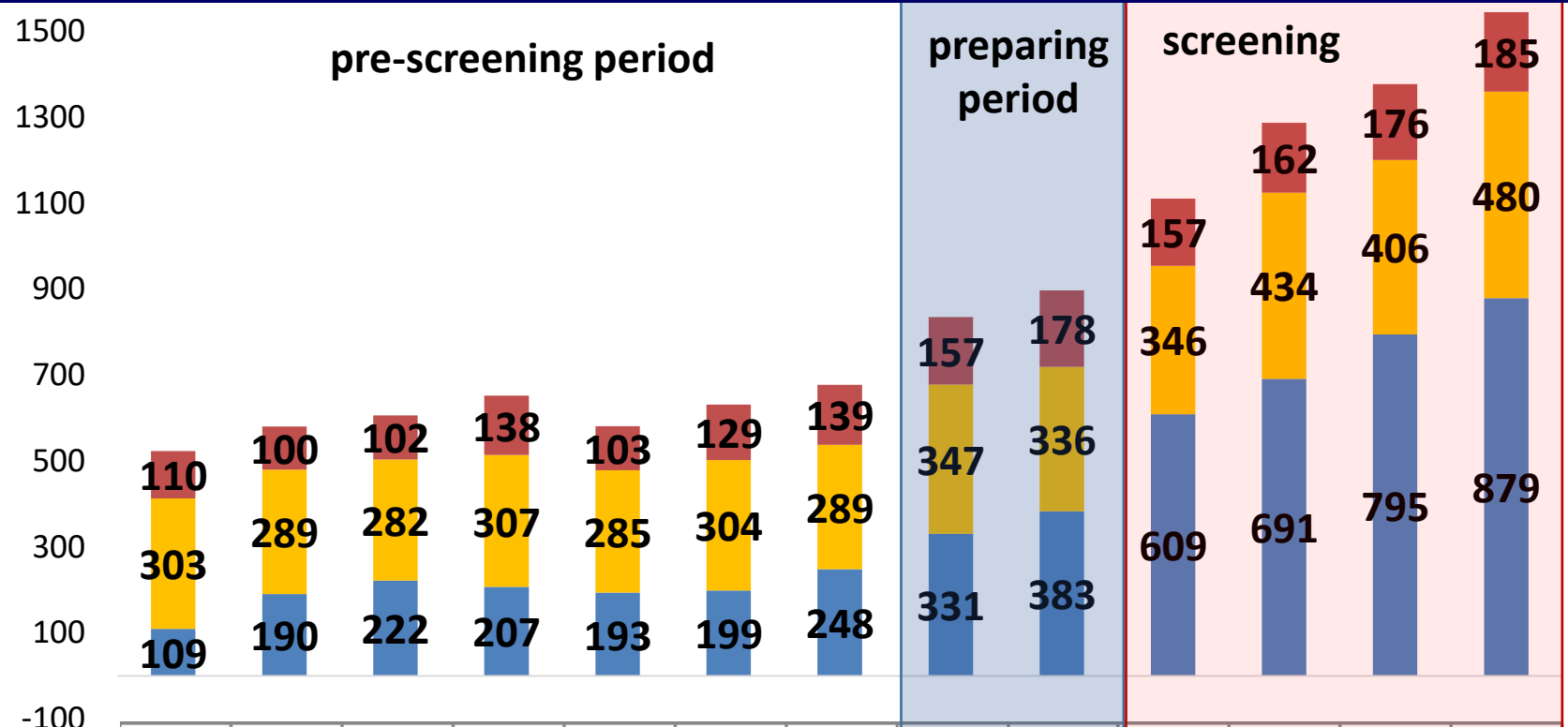
Standartised indicators of PCa in Kazakhstan 2004 – 2016 years



Age-specific detection of PCa, 2014 - 2016

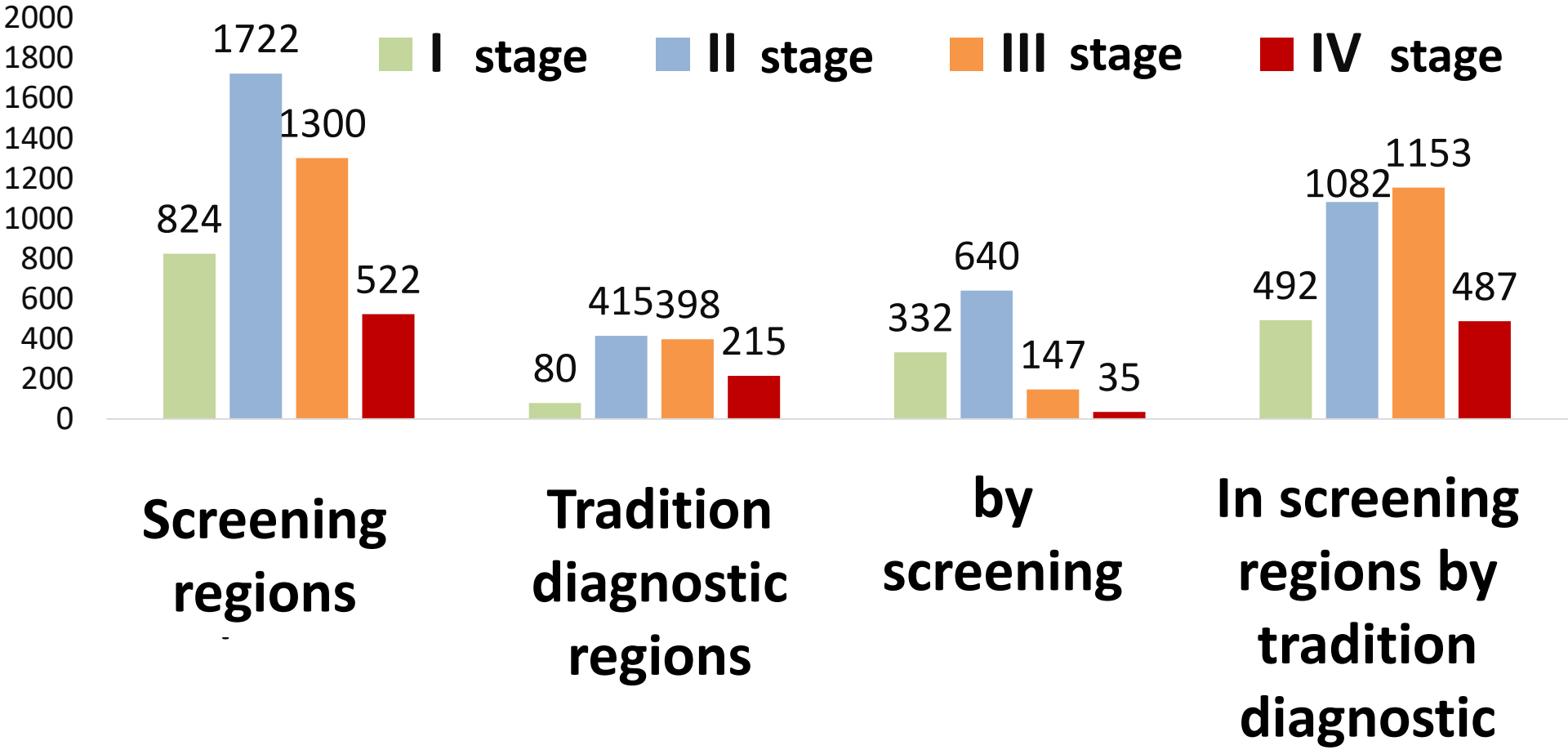


Distribution by stages, PCa in Kazakhstan 2004 – 2016 years

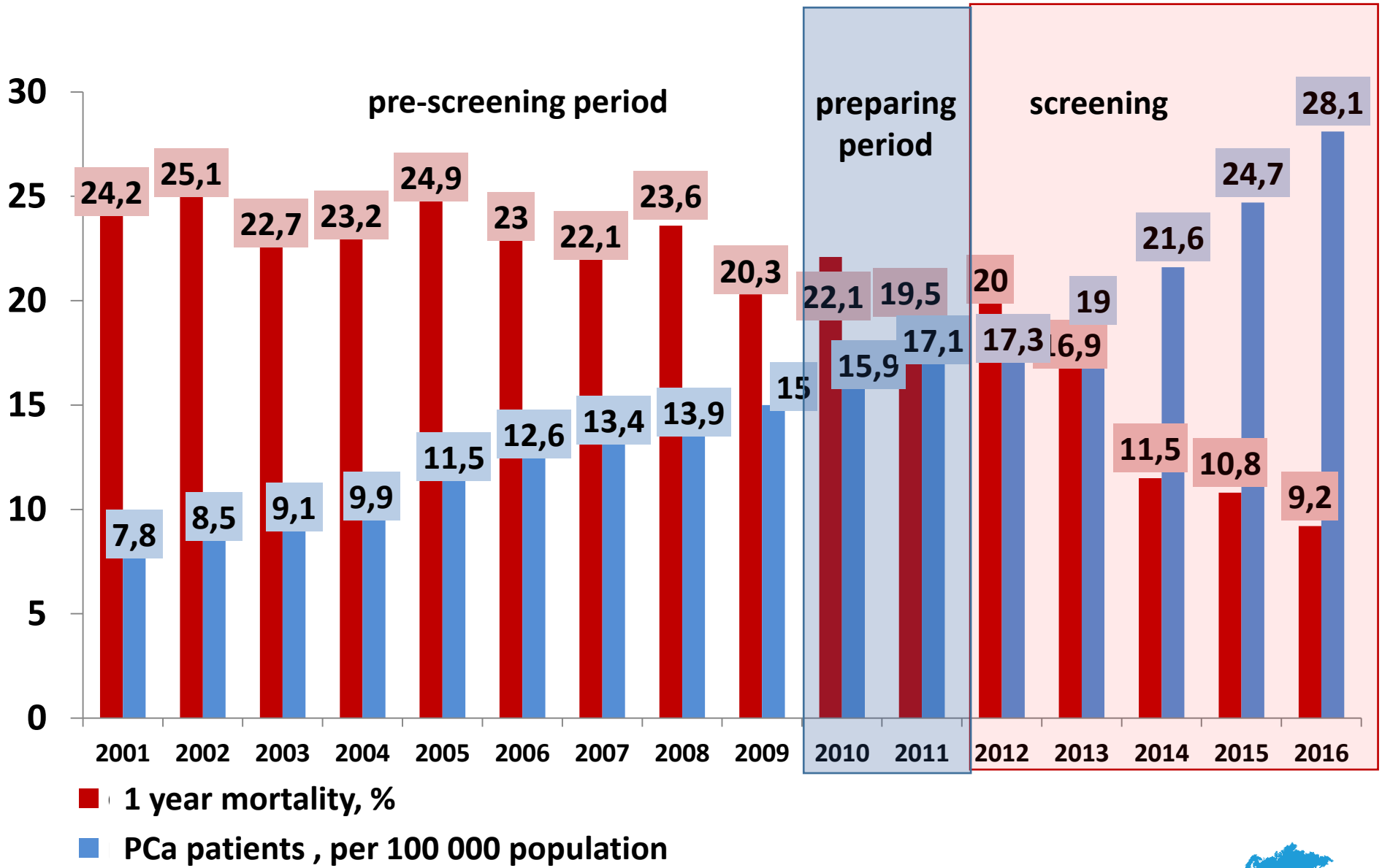


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
IV stage	21,1	17,3	16,9	21,2	17,7	20,4	20,6	18,8	19,8	14,1	12,6	12,8	12
III stage	58	49,9	46,5	47,1	49	48,1	42,7	41,6	37,5	31,1	33,7	29,5	31,1
I-II stages	20,9	32,8	36,6	31,7	33,3	31,5	36,7	39,6	42,7	54,8	53,7	57,7	56,9

Distribution by stages of newly diagnosed PCa, 2013-2016



Dynamic of PCa epidemiology in Kazakhstan 2001 – 2016 years



Evaluation of diagnostic efficacy of PCa screening

For detection of 1 PCa	2013 year	2014 year	2015 year	2016 year	2013-2016 years
Total PSA	**503,3**	**462,2**	**368,4**	**259,6**	**371,0**
Phi detection	**5,3**	**9,0**	**7,7**	**6,7**	**7,4**
biopsy	**4,6**	**6,2**	**4,7**	**5,8**	**5,5**
Cost, euro	**2128,0**	**2348,1**	**1883,7**	**1554,9**	**1914,6**

Model for 1000 people screened for prostate cancer, 2013 - 2016

1000
Men PSA

20 men prostate health index (phi)

7 men PSA > 10

12 men phi > 25

15 men TRUS + biopsy

3 – PCa (0,3%)

5 – precancerous diseases(0,5%)

6 – benign prostate hyperplasia (0,6%)

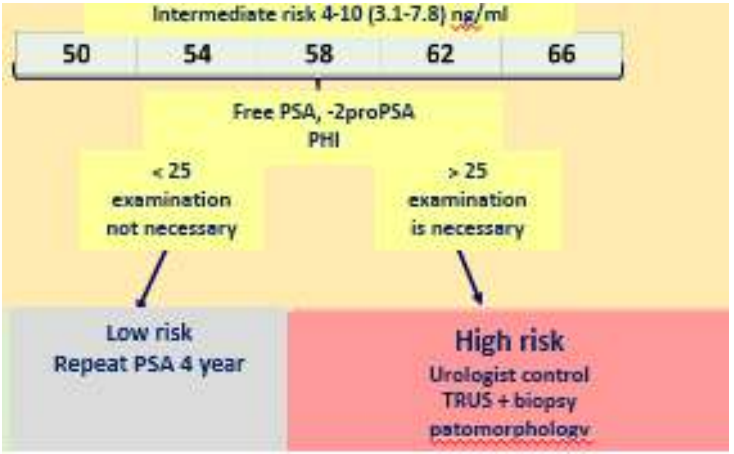
1 – inflammation (0,1%)

Detection of PHI value and it's cut- off 25

$$PHI = \frac{[-2]pro - PSA}{fPSA} * \sqrt{tPSA}$$

Klyo I. J. Med 2008;52:86–91.

- 338 men PSA level from 4 to 10 ng/ml (mean age 56,4 year)
- Evaluation of PSA isoforms
- Detection of PHI by Hybritech calibration
- Prostate biopsy (8 core) by TRUS guide



гистология	PHI < 25	PHI ≥ 25
PCa	4 (5,8%)	65 (94,2%)
Others diseases	245 (91,1%)	24 (8,9%)

Diagnostic indicators for phi ≥ 25

indicator	result	CI 95%
sensitivity	**94,2%**	86,0 ÷ 97,7
specificity	**91,1%**	87,1 ÷ 93,9
positive predictive value	**73,0%**	63,0 ÷ 81,2
negative predictive value	**98,4%**	95,9 ÷ 99,4
diagnostic accuracy	**91,7%**	88,3 ÷ 94,2
Bias index	**0,06**	-

PHI level – PCa detection

level phi	Chi- scuare (χ2)	p - value
< vs ≥ 20	1,53	p=0.216
< vs ≥ 25	8,7	p=0.003
< vs ≥ 30	10,6	p=0.001
< vs ≥ 35	8,5	p=0.004
< vs ≥ 40	7,9	p=0.005
< vs ≥ 45	4,1	p=0.044
< vs ≥ 50	2,4	p=0.124

PHI level ≥ 25, good predictor for Pca for on population- based screening

PHI leval– Aggressive PCa

PHI level	PCa probability	Gilson score 1-6	Gilson score 7-10
0-20	14,3%	14,3%	0
20,1-25	15,8%	15,8%	0
25,1-30	26,1%	11,9%	14,2%
30,1 – 40	34,8%	14,5%	20,3%
40,1 - 50	56,5%	16,3%	30,2%
> 50	33,2%	12,1%	21,1%

Implementation of WHO and ImPACT mission recommendations

Cervical cancer screening	Age groups and coverage rate are increased. Monitoring for precancer detection is strengthened. The pilot of HPV-based screening is planned
Breast cancer screening	Age groups are increased (40-70 years), increasing of coverage rate is planned. The completion of digitalization is scheduled
Colorectal cancer screening	Age groups are increased, increasing of coverage rate is planned. ADR indicator is introduced
~~**Esophageal and stomach cancer, prostate cancer and liver cancer screenings**~~	Canceled

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ КАЗАХСТАН

Всемирная организация здравоохранения

IAEA Programme of Action for Cancer Therapy PACT

KazIOR