

DOI: 10.31082/1728-452X-2019-203-5-2-7

УДК 616.329/33-006.6:314.4(574)

ASSESSMENT OF INCIDENCE AND MORTALITY FROM MALIGNANT NEOPLASMS OF THE UPPER GASTROINTESTINAL TRACT IN KAZAKHSTAN

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The International Agency for Research on Cancer reports about 1.6 million new cases and 1.3 million deaths from malignant neoplasm of the upper gastrointestinal tract in the world every year. This cancer demonstrates a global downward trend in incidence and mortality.

Objective. To estimate the features of incidence and mortality from malignant neoplasms of the esophagus and stomach in Kazakhstan.

Material and Methods. The study included a retrospective analysis of consolidated data of the Ministry of Health of the Republic of Kazakhstan on patients with primary registered esophageal cancer (ICD-C15) and stomach cancer (ICD-C16) and the data of the Committee for Statistics of the Ministry of National Economy of the Republic of Kazakhstan on deaths from these cancers. Descriptive and analytical methods of cancer epidemiology and medical statistics were used.

Results and Discussion. 12,946 new cases of esophageal cancer and 27,467 new cases of stomach cancer were registered during the study period, with 9,326 и 19,672 deaths, respectively. Standardized rates (world standard) of esophageal cancer incidence and mortality have amounted to 8.3‰ (95% CI=7.7-8.8‰) and 6.4 (95% CI=5.4-7.4‰), respectively. The similar rates for stomach cancer were 17.2‰ (95% CI=16.5-17.9‰) and 13.2‰ (95% CI=11.7-14.8‰). At that, the standardized incidence and mortality rates showed a downward trend both in esophageal cancer (T=-3.2% and T=-3.4%, respectively) and stomach cancer T=-1.8% and T=-5.8%, respectively) The age-related incidence and mortality rates for these cancers were growing unimodally, with a peak in the age group of 70 years and above. The age-related incidence and mortality rates for these cancers had a tendency to decrease in almost all groups, except for esophageal cancer: an increase in the incidence in persons under 30 years (T=+4.1%) and in mortality at 30-39 years (T=+2.6%).

Keywords: esophagus cancer, stomach cancer, incidence, mortality, trends, Kazakhstan.

For reference: Igissinov NS, Kozhakhmetov SK, Taszhanov RS, Igissinova GS, Turebayev DR, Bilyalova ZA, Kerimkulov DB, Mukazhanova AS. Assessment of incidence and mortality from malignant neoplasms of the upper gastrointestinal tract in Kazakhstan. *Meditsina (Almaty) = Medicine (Almaty)*. 2019;5(203):2-7 (In Russ.). DOI: 10.31082/1728-452X-2019-203-5-2-7

Т Ұ Ж Ы Р Ы М

ҚАЗАҚСТАНДА АСҚАЗАН-ІШЕК ЖОҒАРҒЫ БӨЛІКТЕРІНІҢ ҚАТЕРЛІ ІСІКТЕРІНЕН БОЛҒАН АУРУШАҢДЫҚТЫ ЖӘНЕ ӨЛІМ-ЖІТІМДІ БАҒАЛАУ

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Поступила 22.04.2019

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Обырды зерттеу жөніндегі халықаралық агенттіктің мәліметі бойынша жыл сайын дүниежүзінде асқазан-ішек жолының жоғарғы бөліктерінің қатерлі ісіктерінен шамамен 1,3 миллион адамның өлгені және 1,6 миллион адамның жаңадан ауырғандығы тіркеледі. Обырдың бұл формасымен аурушаңдықтың және өлім-жітімнің азаю үрдісі байқалады.

Мақсаты. Қазақстандағы өңеш және асқазан қатерлі ісіктерімен аурушаңдық пен өлім-жітімнің ерекшеліктерін бағалау.

Материал және әдістері. 2009-2018 жылдар бойынша ретроспективтік зерттеулер. Зерттеу материалы ретінде Қазақстан Республикасы Денсаулық сақтау министрлігінің өңеш обырының (АХЖ 10-С15) және асқазан обырының (АХЖ 10-С16) алғаш рет анықталған қатерлі ісіктері туралы жиынтық мәліметтері, сондай-ақ Қазақстан Республикасы Ұлттық экономика министрлігінің Статистика комитетінің обырдың осы формасынан қайтыс болғандар туралы мәліметтері пайдаланылды. Онкоэпидемиология мен медициналық статистиканың дескриптивтік және аналитикалық әдістері пайдаланылды.

Нәтижелері және талқылауы. Зерттелген кезеңде 12 946 өңеш обыры және 27 467 асқазан обыры тіркелді, ал қайтыс болғандар саны 9 326 және 19 672. Өңеш обырымен аурушаңдық пен өлім-жітімнің стандартталған көрсеткіштері сәйкесінше (дүниежүзілік стандарт) 8,3‰ (95% СИ=7,7-8,8‰) және 6,4 (95% СИ=5,4-7,4‰) құрады, асқазан обырына қатысты да осы көрсеткіштер 17,2‰ (95% СИ=16,5-17,9‰) және 13,2‰ (95% СИ=11,7-14,8‰). Аурушаңдық пен өлім-жітімнің стандартталған көрсеткіштерінің трендтері динамикада өңеш обырының (Т=-3,2% және Т=-3,4% тиісінше), сондай-ақ асқазан обырының (Т=-1,8% және Т=-5,8% тиісінше) төмендеу үрдісі байқалды. Зерттеліп отырған обыр формасымен аурушаңдық пен одан болатын өлім-жітімнің жасқа байланысты көрсеткіштері 70 жастағы және одан үлкен жастағылар арасында униמודальдық артты. Қатерлі ісіктің зерттеліп отырған формасымен сырқаттанушылық пен өлім-жітімнің жас көрсеткіштері 70 және одан жоғары жастағы топта бірмодальдық өсімге ие болғаны анықталды. Обырдың біз зерттеп отырған формасымен аурушаңдық пен өлім-жітімнің жасқа байланысты көрсеткіштер трендтері барлық топтарда төмендеу тенденциясына ие болды, тек өңеш обырын қоспағанда: 30 жасқа дейінгілерде (Т=+4,1%) және өлім-жітім 30-39 (Т=+2,6%).

Негізгі сөздер: өңеш обыры, асқазан обыры, аурушаңдық, өлім-жітім, трендтер, Қазақстан.

РЕЗЮМЕ

ОЦЕНКА ЗАБОЛЕВАЕМОСТИ И СМЕРТНОСТИ ОТ ЗЛОКАЧЕСТВЕННЫХ НОВООБРАЗОВАНИЙ ВЕРХНИХ ОТДЕЛОВ ЖЕЛУДОЧНО-КИШЕЧНОГО ТРАКТА В КАЗАХСТАНЕ

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По данным Международного агентства по изучению рака, ежегодно в мире регистрируется около 1,6 миллиона новых случаев и 1,3 миллиона умерших от злокачественных новообразований верхних отделов желудочно-кишечного тракта. В мире наблюдается тенденция к снижению заболеваемости и смертности от данных форм рака.

Цель. Оценить особенности заболеваемости и смертности от злокачественных новообразований пищевода и желудка в Казахстане.

Материал и методы. Исследование ретроспективное за 2009-2018 гг. Материалом исследования послужили сводные данные Министерства здравоохранения Республики Казахстан, о впервые выявленных случаях злокачественных новообразований рака пищевода (МКБ 10-С 15) и рака желудка (МКБ 10-С16), а также данные Комитета статистики Министерства национальной экономики Республики Казахстан об умерших от данных форм рака. Использованы дескриптивные и аналитические методы онкоэпидемиологии и медицинской статистики.

Результаты и обсуждение. За изучаемый период было зарегистрировано 12 946 новых случаев рака пищевода и 27 467 – рака желудка, а умерло 9326 и 19 672 соответственно. Установлено, что стандартизованные показатели (мировой стандарт) заболеваемости и смерт-

ности от рака пищевода составили 8,3‰ (95% ДИ=7,7-8,8‰) и 6,4 (95% ДИ=5,4-7,4‰) соответственно, аналогичные показатели при раке желудка 17,2‰ (95% ДИ=16,5-17,9‰) и 13,2‰ (95% ДИ=11,7-14,8‰). При этом тренды стандартизованных показателей заболеваемости и смертности в динамике имеют тенденцию к снижению как при раке пищевода (T=-3,2% и T=-3,4% соответственно), так и при раке желудка (T=-1,8% и T=-5,8% соответственно). Установлено, что возрастные показатели заболеваемости и смертности изучаемых форм рака имели унимодальный рост с пиком в возрастной группе 70 лет и старше. Тренды возрастных показателей заболеваемости и смертности изучаемыми формами рака имели тенденцию к снижению практически во всех группах, за исключением рака пищевода: рост заболеваемости у лиц до 30 лет (T=+4,1%) и смертности в 30-39 лет (T=+2,6%).

Ключевые слова: рак пищевода, рак желудка, заболеваемость, смертность, тренды, Казахстан.

Для ссылки: Игисинов Н.С., Кожахметов С.К., Тасжанов Р.С., Игисина Г.С., Туребаев Д.К., Билялова З.А., Керимкулов Д.Б., Мукажанова А.С. Оценка заболеваемости и смертности от злокачественных новообразований верхних отделов желудочно-кишечного тракта в Казахстане. // Медицина (Алматы). – 2019. - №5 (203). – С.2-7

The International Agency for Research on Cancer reports about 1.6 million new cases and 1 million deaths from malignant neoplasm of the upper gastrointestinal tract in the world every year. Of them, oesophagus cancer accounts for 572,000 cases and 509,000 deaths a year; while, stomach cancer accounts for 1,033,000 cases and 783,000 deaths a year [1]. Age-standardized rates (ASR, World) incidence has amounted to 6.30/0000 for oesophageal cancer and 11.10/0000 for stomach cancer, at the standardized mortality of 5,50/0000 и 8,20/0000, respectively. At that, high incidence and mortality from oesophageal cancer were registered in Kenya (18.40/0000 and 18.40/0000, respectively), Mongolia (18.50/0000 and 16.30/0000, respectively) and Malawi (18.70/0000 and 18.30/0000, respectively). The incidence of stomach cancer was high in Japan (27.50/0000), Mongolia (33.10/0000), and South Korea (39.60/0000), while the mortality was high in China (17.50/0000), Bhutan (18.90/0000), and Mongolia (25.00/0000) [1].

The issue of oesophageal and stomach cancer remains acute in spite of the successes in diagnostics and treatment. Epidemiological studies [2-7] in this field indicate geographical variability of incidence and mortality influenced by many exogenous and endogenous risk factors. At that, the questions of organizing and conducting screening of the upper gastrointestinal tract play an important role in anticancer control. The developed countries [8, 9] like Japan [10, 11] and South Korea [12] have been most successful in screening activities.

Objective. To estimate the features of incidence and

mortality from malignant neoplasms of the esophagus and stomach in Kazakhstan.

MATERIAL AND METHODS

The data was mainly taken from the consolidated reports on the new cases of malignant neoplasms of the oesophagus (ICD-C15) and the stomach (ICD-C16), as well as from the materials of the Committee for Statistics of the Ministry of National Economy of the Republic of Kazakhstan on deaths from these cancers.

This retrospective study utilized the descriptive and analytical methods of cancer epidemiology and medical statistics [13, 14]. The extensive and crude (annual, annual average, errors) rates were calculated, as well as the confidence interval (CI 95%) and standardized rates (World Standard, WHO 2001) [15] with recommendations for their calculation [16]. The time series were analysed (least squares fitting, geometric mean indicators – the average annual growth/decrease rates, T, %) The incidence and mortality rates were calculated per 100,000 of all population (0/0000). Abbreviations used in the tables: abs. – absolute number, AA – average age, crude – crude rate, ASR – age-standardized rate, M+I – mortality-to-incidence ratio, CI – confidence interval.

RESULTS

In 2009-2018, 12,946 new cases of oesophageal cancer and 27,467 new cases of stomach cancer were registered in Kazakhstan, with 9,326 и 19,672 deaths, respectively. The distribution of cases and deaths by age has shown the largest share in the age group 70+ (table 1).

Table 1 – Age-related distribution of cases and deaths from malignant neoplasms of the oesophagus and the stomach in Kazakhstan, 2009-2018

Age	Oesophageal cancer		Stomach cancer	
	New cases (%)	Deaths (%)	New cases (%)	Deaths (%)
<30	26 (0.2)	9 (0.1)	182 (0.7)	59 (0.3)
30-39	104 (0.8)	44 (0.5)	722 (2.6)	332 (1.7)
40-49	661 (5.1)	239 (2.6)	2332 (8.5)	1053 (5.4)
50-59	2640 (20.4)	1210 (13.0)	6381 (23.2)	3258 (16.6)
60-69	4007 (31.0)	2775 (29.8)	8478 (30.9)	5873 (29.9)
70+	5508 (42.5)	5049 (54.1)	9372 (34.1)	9097 (46.2)
Total	12946 (100.0)	9326 (100.0)	27467 (100.0)	19672 (100.0)
AA, M±m	66.9±0.1	68.8±0.2	64.0±0.2	66.9±0.1
95% CI	66.6-67.2	68.4-69.2	63.7-64.3	66.7-67.1

The average age of patients with oesophageal cancer was equal to 66.9 ± 0.1 years and was statistically significantly ($t=12.97$, $p=0.000$) higher than the average age of patients with stomach cancer – 64.0 ± 0.2 years. The same picture was observed when comparing the average age of death: 68.8 ± 0.2 years in oesophageal cancer vs. 66.9 ± 0.1 years in stomach cancer (Table 1), the difference was statistically significant ($t=8.50$, $p=0.000$). In dynamics, the average age of patients with oesophageal cancer was decreasing inexpressibly ($T=-0.03\%$), while the average age of patients with stomach cancer tended to increase ($T=+0.2\%$) (Figure 1).

The average age of deaths from oesophageal cancer was decreasing inexpressibly ($T=-0.1\%$), while the average age of patients with stomach cancer tended to increase ($T=+0.03\%$) (Figure 2).

Average annual crude incidence for oesophageal cancer was equal to $7.6 \pm 0.20/0000$ vs. $16.1 \pm 0.50/0000$ for stomach cancer. The difference was statistically significant ($t=30.05$, $p=0.000$). The mortality from malignant neoplasms of the oesophagus and the stomach has amounted to $5.5 \pm 0.40/0000$ and $11.6 \pm 0.60/0000$, respectively (Table 2); the difference was significant ($t=8.46$, $p=0.000$).

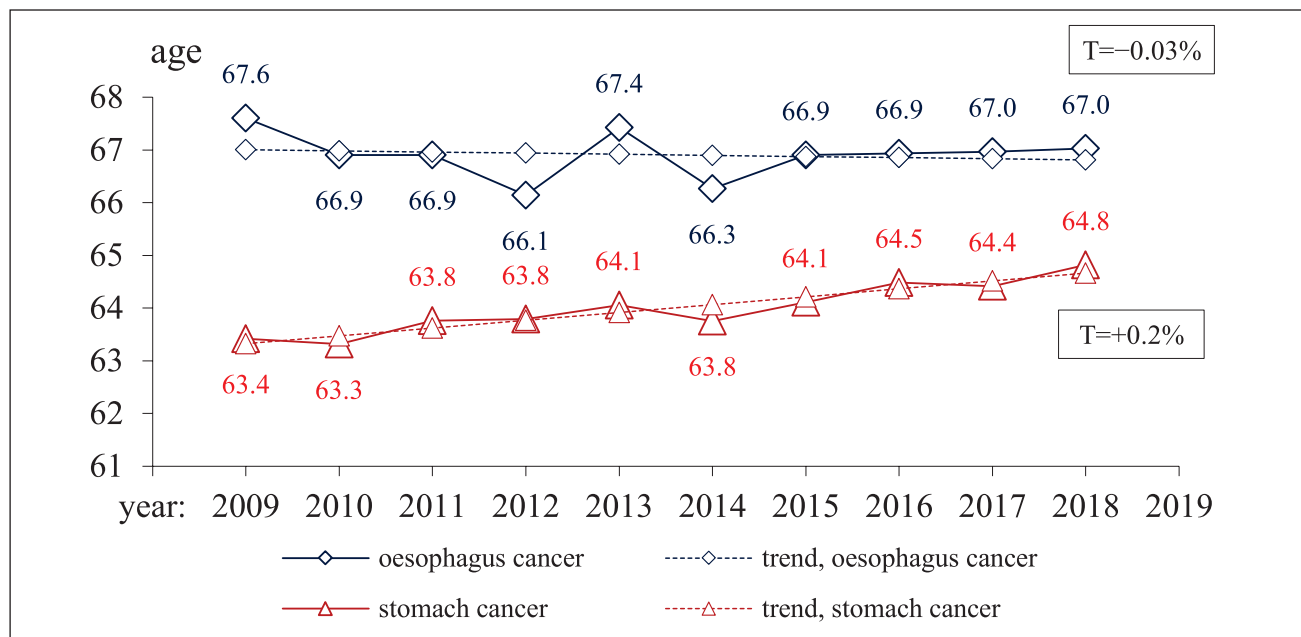


Figure 1 – The dynamics of the average age of patients with malignant neoplasms of the oesophagus and the stomach in Kazakhstan, 2009-2018

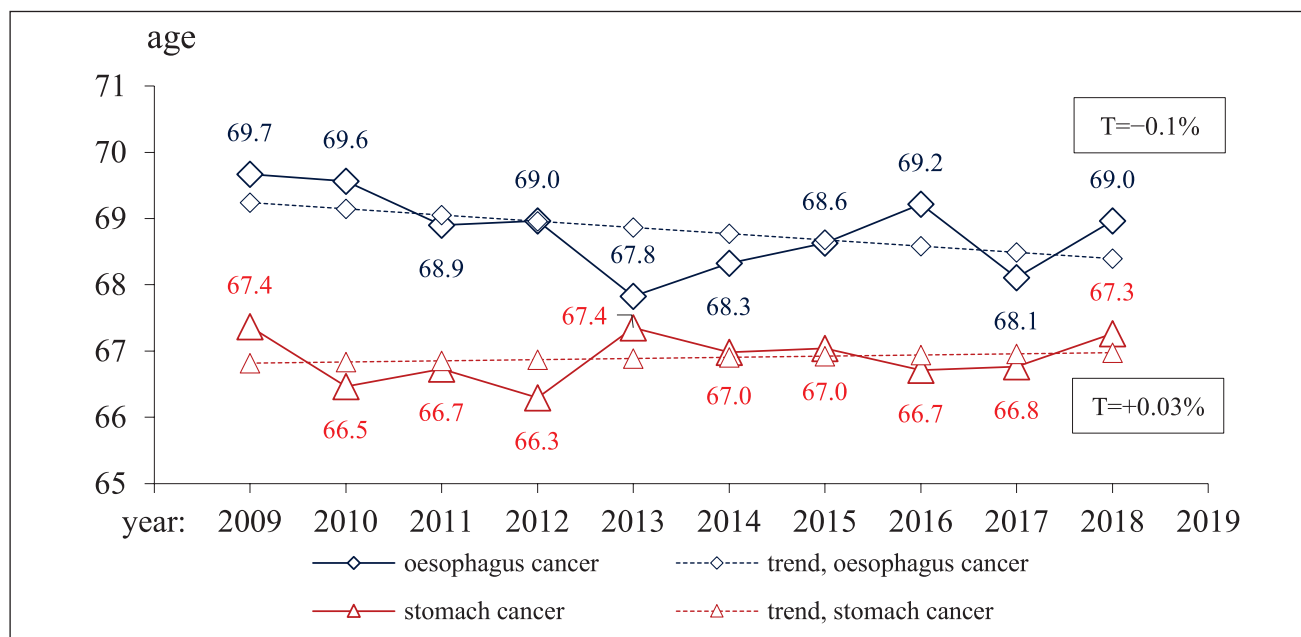


Figure 2 – The dynamics of the average age of death from malignant neoplasms of the oesophagus and the stomach in Kazakhstan, 2009-2018

Table 2 – Average annual incidence and mortality from malignant neoplasms of the oesophagus and the stomach in Kazakhstan, 2009-2018

Age	Oesophageal cancer					Stomach cancer				
	Incidence		Mortality		Mчl	Incidence		Mortality		Mчl
	P±m	T, %	P±m	T, %		P±m	T, %	P±m	T, %	
<30	0.03±0.01	+4.1	0.01±0.00	-6.9	0.35	0.2±0.0	-4.4	0.1±0.0	-8.7	0.33
30-39	0.4±0.1	-7.3	0.2±0.0	+2.6	0.42	2.9±0.2	-4.8	1.3±0.1	-5.1	0.46
40-49	3.0±0.2	-1.5	1.1±0.1	-7.0	0.36	10.7±0.5	-3.9	4.9±0.4	-6.4	0.45
50-59	14.6±0.5	-2.5	6.7±0.5	-5.6	0.46	35.2±1.2	-2.9	18.2±1.4	-7.7	0.52
60-69	41.2±1.9	-4.4	29.0±2.3	-6.9	0.70	86.1±1.6	-1.5	60.9±4.0	-5.5	0.71
70+	70.8±2.0	-2.5	64.9±5.4	-7.7	0.92	120.3±1.5	-1.0	117.0±6.3	-4.8	0.97
CR	7.6±0.2	-2.2	5.5±0.4	-6.5	0.72	16.1±0.2	-1.0	11.6±0.6	-4.9	0.72
ASR	8.3±0.3	-3.2	6.4±0.5	-7.6	0.77	17.2±0.4	-1.8	13.2±0.8	-5.8	0.77

Standardized indicators (Table 2) were calculated to unify the results obtained and eliminate the effect of age-specific differences.

In dynamics, the crude incidence of oesophageal cancer has decreased from 8.1±0.20/0000 in 2009 to 6.7±0.20/0000 in 2018. After equalization of this indicator, the tendency to decrease was confirmed, and the average annual rate of decline was T=-2.2% (Table 2).

The analysis of stomach cancer incidence and mortality rates in dynamics has shown a downward trend; average annual rates of decline are presented in table 2.

The age-related incidence and mortality from malignant neoplasms of the oesophagus and the stomach were growing unimodally, with a peak in the age group of 70 years and above (Table 2). It should be noted that the mortality-to-incidence ratio was increasing with age; at that, the highest ratio was registered in the older age group 70 years and older – 0.92 with oesophageal cancer and 0.97 with stomach cancer (table 2).

DISCUSSION

The obtained results place Kazakhstan among the countries with high incidence and mortality from malignant neoplasms of the oesophagus and the stomach, such as: Afghanistan (8.2 and 8.00/0000, hereinafter, incidence and mortality, respectively), Turkmenistan (9.2 and 8.20/0000), Uganda (10.8 and 10.60/0000), and Tajikistan (11.1 and 10.00/0000) for oesophageal cancer; Belarus (16.5 and 9.60/0000), Chile (17.8 and 11.50/0000), Kyrgyzstan (18.6 and 16.60/0000), and Bhutan (19.4 and 18.90/0000) [1] for stomach cancer.

The largest share of cases and deaths from oesophageal and stomach cancer was registered in older age groups (70 years and older). It corresponds to the results of studies conducted in the UK in 2013-2015 in which in average about 4 out of 10 (41%) of new cases annually were registered in people aged 75 years and above.

Age-related incidence and mortality from cancer of the

upper gastrointestinal tract in Kazakhstan grow unimodally, with a peak in people aged 70 years and above. A similar situation has been identified in European countries, for example, the UK where age-related incidence increases dramatically from about 45-49 years old and the highest rates are observed in the age group of 85 years [17].

The analysis of the dynamics of crude and standardized incidence and mortality rates has revealed downward trends. It is not consistent with global statistics where forecast indicators are growing [18]. This fact is alarming since one of the signs of the efficiency of the national cancer service is an increase in incidence and a decrease in mortality due to the detection of diseases at earlier stages.

CONCLUSION

Thus, the assessment of incidence and mortality from malignant neoplasms of the upper gastrointestinal tract indicate the relevance of the studied issues. Conducting screening is one of the effective measures to achieve positive results. The obtained results are recommended for monitoring and assessment of anticancer activities conducted in the Republic of Kazakhstan.

Research transparency

Research did not have a sponsorship. The authors are absolutely responsible for presenting the release script for publication.

Declaration about financial and other relations

All authors took part in elaboration of article conception and writing the script. The release script was approved by all authors. The authors did not get the honorary for the article.

Conflict of interest

The authors declare no conflict of interest.

The article was written as part of the project «Decreasing the burden of gastric cancer in Kazakhstan: evaluation of the existing situation and search for improvement possibilities» (AP05133849)

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