

IMPACT OF USING INNOVATIVE ANTINEOPLASTIC DRUGS ON CANCER MORTALITY IN RUSSIA

Nikolay A Avxentyev^{1,2,3}, Natalia N Sisigina^{1,2}, Maxim Y Frolov ^{4,5}, Alexander S Makarov⁶

¹ Financial Research Institute, Moscow, Russia

² Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia

³ Pharmaceutical Analytics Middle East, Ras al Khaimah, UAE

⁴ Volgograd State Medical University, Volgograd, Russia

⁵ Volgograd Medical Scientific Center, Volgograd, Russia

⁶ Health and Market Access Consulting, Moscow, Russia

BACKGROUND

- In 2019 Russia launched federal «Cancer Control» project. Its main objective is to reduce cancer mortality from 202.0 to 195.1 cases per 100 000 people by 2024.
- More than 13.3 bln US\$ were allocated for implementation of the Project and the major funding (10.4 bln US\$) were intended for providing medical care to cancer patients in accordance with modern clinical guidelines. They are mainly used for procurement of antineoplastic drugs.

OBJECTIVES

- The aim of this work was to assess impact of using innovative antineoplastic drugs indicated for treatment of common malignant neoplasms (i.e. lung, prostate, renal cell and ovarian cancer) on cancer mortality in Russia.

METHODS

- We identified innovative antineoplastic drugs that are used for considered indications, registered in Russia and included in the Vital and Essential Drug List (VEDL). Main inclusion criteria was statistically significant superiority in overall survival compared to standard of care that was proven in randomized clinical trials, indirect comparisons, RWEs, or by other sources.
- The following innovative antineoplastic drugs and indications were considered (table 1):

Drug	Indication	Considered standard of care	Source
Durvalumab	stage III, locally advanced, unresectable non–small-cell lung cancer (NSCLC), after chemoradiotherapy	No therapy	PACIFIC ¹
Osimertinib	untreated EGFR-Mutated Advanced NSCLC	Gefitinib / Erlotinib	FLAURA ²
Enzalutamide	metastatic hormone-sensitive prostate cancer	Androgen deprivation therapy	ENZAMET ³
Nivolumab + ipilimumab	metastatic or recurrent NSCLC without EGFR or ALK mutations	Chemotherapy	CheckMate 9LA ⁴
Nivolumab + ipilimumab	advanced renal-cell carcinoma (RCC) in adults with an intermediate or poor prognosis who have not previously received therapy	Sunitinib	CheckMate 214 ⁵
Olaparib	maintenance therapy of newly diagnosed, histologically confirmed advanced high-degree malignancy or endometrioid ovarian cancer, primary peritoneal cancer, or fallopian-tube cancer with BRCA mutation with complete or partial clinical response to first-line chemotherapy	No therapy	Mathematical modelling ⁶ based on results of SOLO1 ⁷ , SOLO2 ⁸ , AURELIA ⁹ , OCEANS ¹⁰

- For each drug we estimated the number of patients, who can start treatment annually using statistical data. For each clinical situation we started with statistical data on incidence of the disease and then narrowed these cases by several multipliers that reflect specific characteristics of the target population.
- Then we estimated the number of deaths that could be avoided in 2022 – 2024 due to the overall survival differences between new drugs compared to the standard of care (figure 1). This estimation was done for every cohort of patients who can receive innovative drugs instead of standard of care each year.

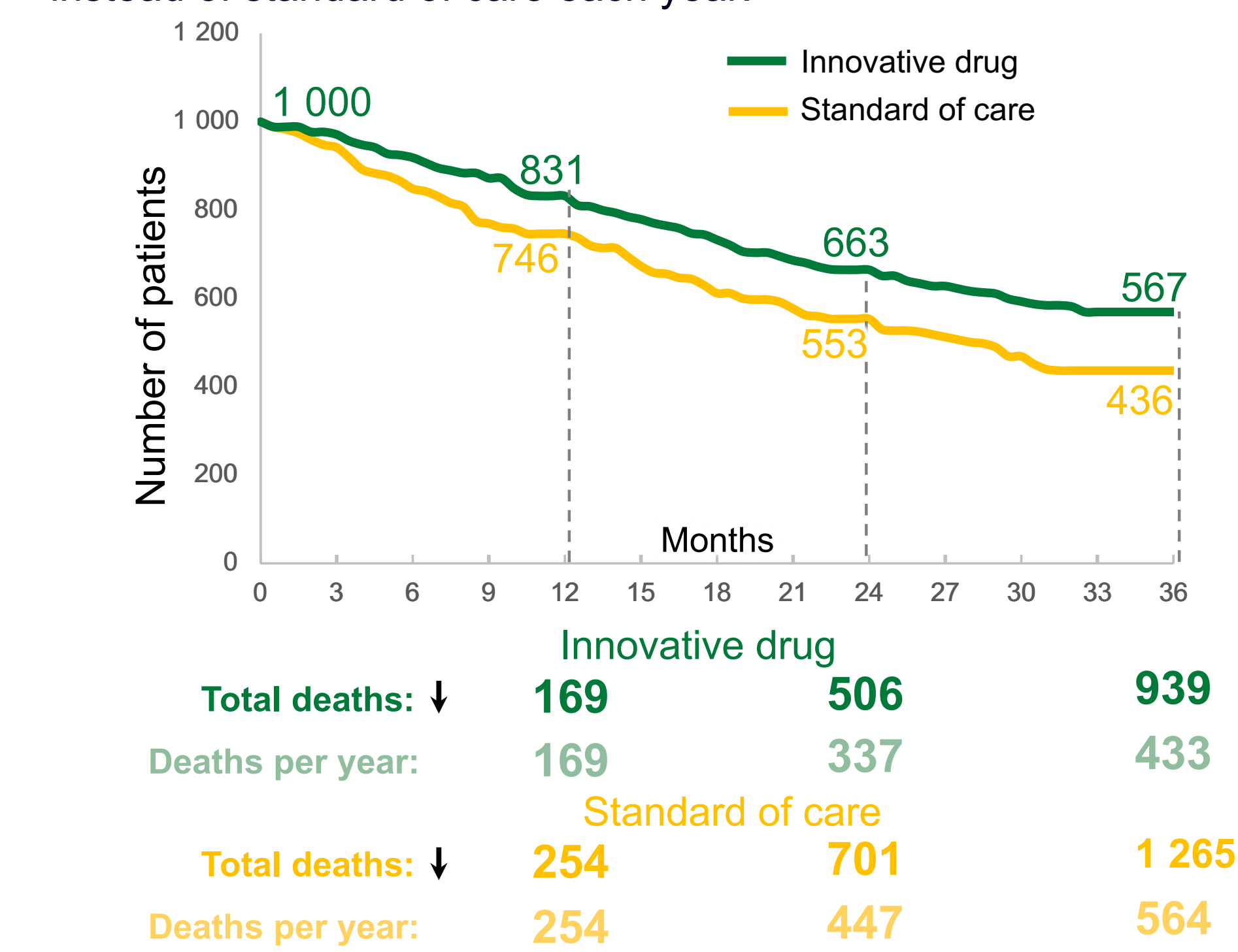


Figure 1. Estimation of avoided deaths due to the use of innovative drug (hypothetical example)

- Finally, number of avoided deaths was compared to target level of decrease, which should be achieved to meet goals of Federal “Cancer control” project in 2022-2024.
- We also estimated the budget impact of using considered drugs and compared it to the budget of the Federal project

RESULTS

- Approximately 20,500 patients can start treatment with considered drugs in Russia annually (table 2).

Drug	Incidence (per annum)	Available for therapy (per annum)
Durvalumab (LC)	47 021	2 391
Osimertinib (LC)	47 021	2 334
Enzalutamide (PC)	44 653	2 410
Nivolumab + ipilimumab (LC)	47 021	8 049 – 8 084
Nivolumab + ipilimumab (RCC)	23 591	3 273 – 3 337
Olaparib (OC)	12 444	2 021

LC – lung cancer, PC – prostate cancer, RCC – renal cell cancer, OC – ovarian cancer

Table 2. Estimated number of patients available for treatment every year

- In three-year period use of durvalumab could lead to reduction of cancer mortality by 779 deaths, osimertinib – by 723 deaths, enzalutamide – by 313 deaths, olaparib – by 679 deaths and nivolumab + ipilimumab (both indications) – by 4 124 deaths. Totally these drugs provide 33% of reduction that should be achieved to meet Federal project goals in 2022-2024.
- Costs of using considered drugs is 88% of Federal project budget on drug procurements.

	1 st year	2 nd year	3 rd year	Total
Number of deaths to be avoided to meet Federal project goal (compared to 2020)	3 740	6 682	9 724	20 146
Possible number of avoided deaths	1 770	2 516	2 331	6 618
Durvalumab	203	264	312	779
Osimertinib	140	350	233	723
Enzalutamib	33	97	183	313
Nivolumab + ipilimumab	1 307	1 546	1 271	4 124
Olaparib	87	259	332	679
% of target	47,3%	37,7%	24,0%	32,9%
Incremental drug costs, bln US\$	1,34	1,84	1,92	5,10
Federal project budget, bln US\$	1,94	1,94	1,94	5,82
Ratio of incremental costs to Federal project budget	69,2%	95,0%	98,8%	87,7%

Table 3. Estimated number of avoided deaths and budget impact.

CONCLUSION

- Using of novel antineoplastic drugs leads to a quantifiable reduction in cancer mortality in Russia
- Additional funding is required for further development of “Cancer control” Federal project.

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