

SARS-CoV-2 as a new possible long-lasting determining factor impacting cancer death numbers. Based on the example of breast, colorectal and cervical cancer in Poland

Paweł Koczkodaj¹, Urszula Sulkowska², Michał F. Kamiński³, Joanna Didkowska^{1,2}

¹Cancer Epidemiology and Primary Prevention Department, Maria Skłodowska-Curie National Research Institute of Oncology, Warsaw, Poland

²National Cancer Registry, Maria Skłodowska-Curie National Research Institute of Oncology, Warsaw, Poland

³Cancer Prevention Department, Maria Skłodowska-Curie National Research Institute of Oncology, Warsaw, Poland

Introduction. So far, cancer burden has mainly been connected with the age structure of a given population and changes in risk factor exposure combined with lifestyle. Nowadays, available data indicates that the SARS-CoV-2 virus may be a new strong agent impacting the number of cancer deaths in the future.

Material and methods. In our study we analyzed changes in cancer screening as well as participation in a fast path of oncological diagnosis and treatment – before and during the SARS-CoV-2 pandemic in Poland – taking into consideration breast, colorectal and cervical cancer.

Results. We investigated substantial changes connected with the pandemic. In the case of cancer screening – despite the end of lockdown – population coverage and participation percentages are still lower than before the pandemic.

Discussion. Similar results were observed in different studies, e.g. in the United Kingdom similar declines are evident as well as a simultaneous prognosis of an increase in cancer death numbers.

Conclusions. Immediate health policy actions are needed in order to reverse unfavorable trends in cancer screening, treatment and ultimately in the number of cancer deaths in Poland.

Key words: SARS-CoV-2, COVID-19, cancer deaths, cancer prevention, Poland

Introduction

Breast cancer and colon cancer are one of the most frequent malignancies in Poland. In accordance to the latest data from the National Cancer Registry in Poland, in 2017 breast cancer was the most frequent cancer type among women causing 18 529 new cases (*European Standard Population 2013 – ESP2013*: 91.3) and 6 670 deaths (*ESP2013*: 32.7), being also the second cause of cancer deaths among the female population. Among women, the colon is also the second leading cancer location – 5073 cases (*ESP2013*: 25.2). In the male population – the third most frequent – 5832 cases (*ESP2013*: 41.6). Looking

solely at colon cancer in Poland, this tumor contributes to 3573 deaths (*ESP2013*: 17.6) in women and 4181 (*ESP2013*: 32.2) in the male population and it is the third highest cause of cancer deaths among both sexes. Additionally, rectum cancer was diagnosed among 2198 (*ESP2013*: 10.9) women and 3419 (*ESP2013*: 23.13) men causing respectively 1377 (*ESP2013*: 6.8) and 2161 (*ESP2013*: 16.4) deaths. Considering cervical cancer, in 2017 there were 2502 new cases (*ESP2013*: 12.3) and 1609 deaths (*ESP2013*: 7.9) due to this cancer type [1]. Despite its relatively low incidence, cervical cancer in Poland is characterized by a high mortality rate. In comparison with other countries

How to cite:

Koczkodaj P, Sulkowska U, Kamiński MF, Didkowska J. SARS-CoV-2 as a new possible long-lasting determining factor impacting cancer death numbers. Based on the example of breast, colorectal and cervical cancer in Poland. *NOWOTWORY J Oncol* 2021; 71: 42–46.

from the World Health Organization (WHO) European Region (40 countries), Poland stands at 11th place concerning world age-standardized mortality rates for cervical cancer (ranked in descending order of mortality) – about 5 deaths per 100 000 women/year (in 2018) [2, 3].

So far, cancer burden was mainly connected with the age structure of a given population and changes in risk factor exposure combined with lifestyle. Nowadays, available data indicates that SARS-CoV-2 virus may be a new strong agent that is significantly impacting cancer deaths. Breast, colorectal and cervical cancers seems to be particularly prone to the discussed phenomenon. Despite the previous low screening coverages and participation rates for the above-mentioned cancer sites, this secondary prevention action provided constant protection against abrupt increases in deaths for those cancers. Similarly, in the case of oncology diagnosis and treatment cards (ODaTCs), a solution introduced in Poland in 2015 within the “Oncological Package” aimed at faster oncological diagnosis and treatment [4] coronavirus pandemic impaired in a large extension a path of rapid oncological diagnosis and treatment. A combination of the above mentioned epidemiological conditions and a meaningful slowdown in cancer screenings as well as issuing ODaTCs, may result in an increase in advanced breast, colorectal and cervical cancer cases and consequently in the number of deaths in Poland in the coming years. Similar scenarios may also be seen in other countries – for example in the Netherlands, where the percentage of cancer diagnoses during the pandemic decreased by about 25%, or in the United Kingdom (UK), where approximately 50% of cancer patients experienced delays in treatment [5].

Material and methods

The aim of our study was to analyze changes in two main areas that have been affected by the SARS-CoV-2 pandemic with potentially the biggest impact on future deaths from breast, colorectal and cervical cancer. These areas are: screening and participation in a fast path of oncological diagnosis and treatment, measured by the number of issued ODaTCs.

Data sourced from the National Health Fund in Poland (NHF) concerns screening coverage¹ [6] – for breast cancer (ICD-10: C50) and cervical cancer (ICD-10: C53) in the period from January to September 2019 and analogous time for 2020. We also analyzed data on colorectal cancer [7] (ICD-10: C18-21) screening participation rates sourced from the Maria Skłodowska-Curie National Research Institute of Oncology in Warsaw, Poland in the period between January and July 2019 and 2020. Moreover, we analyzed also data on ODaTCs issued from January to September 2019 and 2020 for breast, cervical and colorectal cancer (obtained from the Polish NHF [8]). However, in order to limit the effect of understated numbers of ODaTCs

¹ Coverage – the % of eligible women who were screened for a mammography between the age of 50–69 years old, and for cytology – 25–59 years old.

due to diagnostic difficulties, we used additional ICD-10 codes for breast cancer: D05 – breast cancer *in situ* (excluding breast skin cancer *in situ* – D04.5 and malignant melanoma of the breast *in situ* – D03.5) and D48.6 – tumors of uncertain or unknown characteristics in the breast. For cervical cancer: D07 – carcinoma *in situ* of other and unspecified genital organs (excluding skin cancer *in situ* – D03.5) and D39 – carcinoma *in situ* of an uncertain or unknown characteristic in the female genitalia. In colorectal cancer cases: D01 – *in situ* carcinoma of other and unspecified parts of the digestive system organs and D37 – tumors of uncertain or unknown characteristics of the mouth and digestive system organs.

The above indicated periods of time included the beginning of the SARS-CoV-2 outbreak in Poland which occurred in early March 2020. After collecting the data, we created a structured database and preliminarily analyzed the data with the use of Microsoft Excel ver. 15.22 (160506).

Limitations of the study

The main limitation of our study is the scarcity of data due to short, several-month-duration of the SARS-CoV-2 outbreak. However, based on the available data on changes in cancer screenings and issued ODaTCs numbers, we can currently indicate a possible future scenario for breast, cervical and colorectal cancer deaths in Poland that can be connected with the pandemic.

Results

In our study we focused on the data concerning three cancer sites: the breast, cervix and colorectum. In the case of breast cancer (fig. 1), we observed a sharp decrease in the number of issued ODaTCs in the period between January and April 2020 – from 4965 to 2730 cards. However, from May 2020, an increase in the number of ODaTCs is evident and it reaches an even slightly higher level than in May 2019 (4320 vs. 3954). As far as mammography is concerned, we can see a heavy decrease in the coverage percentages. In January 2020, 39.17% of women performed a mammography, in July it was 33.87% (until now, this was the lowest percentage this year). Before the pandemic, in 2019 during an analogous period of time, the lowest percentage in mammography coverage was at a level of 37.15% (in February) and was constantly increasing to 38.52% in September. However, the highest coverage in mammography in 2019 within the considered period was observed in January and reached a level of 39.26%.

Similarly, when examining the data on cervical cancer (fig. 2), we can also see a decrease in the number of ODaTCs during the pandemic. The lowest number of cards were issued on April 2020 – 472. For comparison, in April 2019, this number was equal to 710 ODaTCs. For all considered months in 2020 (1–9), screening coverage percentages for cytology were lower in comparison with those from comparable months in 2019, reaching a historically low level – 14.35% – in September

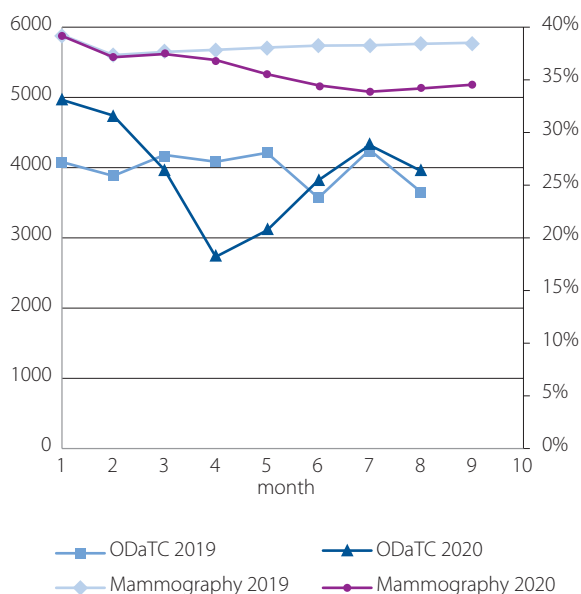


Figure 1. Absolute numbers of issued ODaTCs for breast cancer (ICD-10: C50, D05, D48) treatment and mammography coverage percentages in Poland from January to September (1–9) in the years 2019 and 2020

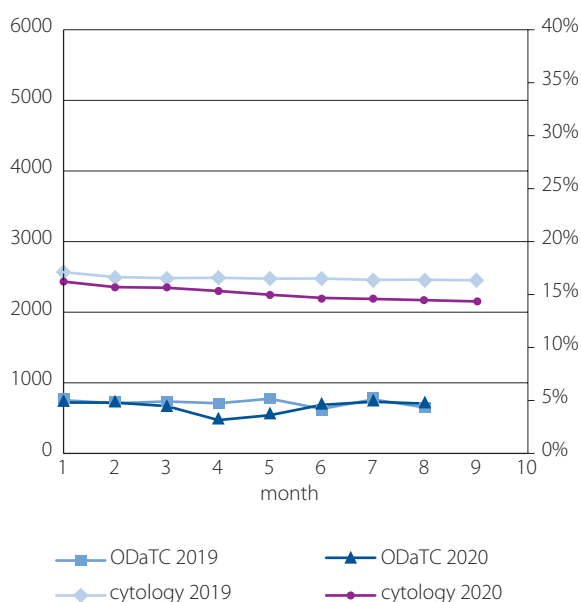


Figure 2. Absolute numbers of issued ODaTCs for cervical cancer treatment (ICD-10: C53, D07, D39) and cytology coverage percentages in Poland from January to September (1–9) in the years 2019 and 2020

2020. Moreover, collected data suggest that in 2020 cytology coverage systematically decreased – without any temporary increase or at least stabilization of the trend (unlike mammography or colonoscopy).

A notable decrease in the number of issued ODaTCs was also observed in colorectal cancer (fig. 3). In April 2020, 2063 cards were issued. In the same month in 2019, this number was equal to 3980. Despite this fact, since May an increase was visible and in July 2020 the number of issued ODaTCs is almost the same as July 2019 (3448 vs. 3583). Considering

the data on colonoscopies, in every analyzed month of 2020 participation rates were much lower than in 2019. In April and May 2020, colonoscopy participation percentages were at the lowest level and for both months were equal to 4.93%. In 2019, percentages for these months were at the level of about 17%.

Despite the end of the lockdown in Poland, the situation regarding screenings and the number of issued ODaTCs did not fully return to its previous state. In the case of screenings, the analyzed data indicates that coverage in mammography and cytology is still lower than before the pandemic. Similarly – in the case of colonoscopy – participation percentages are currently much lower than in the analogous period in 2019. Only in the case of ODaTCs issued for breast and cervical cancer patients can we observe a return to the previous numbers. Considering solely colorectal cancer, approximately 100 less cards were issued for these patients in July 2020 in comparison with 2019 (table I).

Discussion

The epidemiological prognosis provided by the International Agency for Research on Cancer (IARC) shows that in the coming decades we can expect further increases in the cancer burden in Poland. For 2025, the absolute number of new breast cancer cases (for all ages) has been estimated at the level of 21 169 (with an overall change of +4.8% since 2018). For cervical cancer it was 3363 new cases (overall change +4.4% since 2018) and for colorectal cancer in women – 6829 (+10.5% since 2018) and in men – 8104 new cases (+14.3% since 2018).

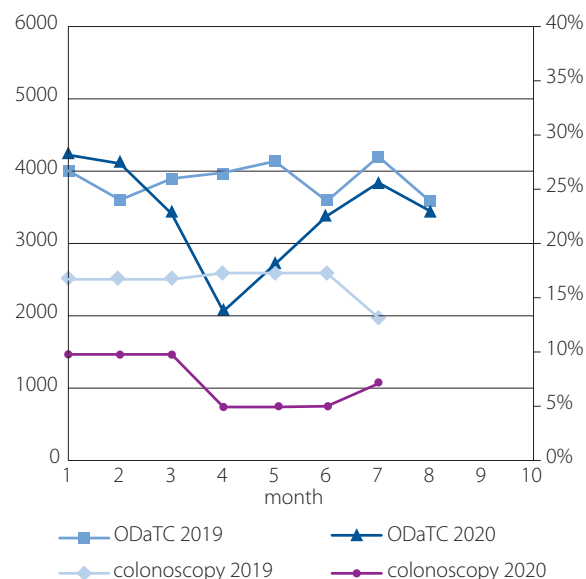


Figure 3. Absolute numbers of issued ODaTCs for colorectal cancer treatment (ICD-10: C-18-21, D01, D37) from January to August in the years 2019–2020 and colonoscopy participation percentages in Poland from January to July (1–7) in the years 2019 and 2020

Table I. Current state of screenings and the numbers of issued ODaTCs based on data from the last available month in 2020 and an analogous month in 2019

Screening	Screening coverage and participation rate* (last available month data)		Return to pre-pandemic state?	Cancer site	Absolute number of issued ODaTCs (last available month data)		Return to pre-pandemic state?
	2019	2020			2019	2020	
mammography (September)	38.52%	34.54%	NO	breast (August)	3654	3954	YES
cytology (September)	16.34%	14.35%	NO	cervix (August)	651	705	YES
colonoscopy (July)	13.16%	7.09%	NO	colon, rectum (August)	3583	3448	NO

*Participation rate for colonoscopy

Apart from the predicted increase in new cases for those cancers, IARC estimates also show a probable increase in the cancer death burden. In 2025 in Poland, 7494 deaths due to breast cancer are expected (with an overall change of +8.3% since 2018). For cervical cancer the number is equal to 2077 (+6.7% since 2018). For colorectal cancer in women – 4558 (+11.9% since 2018) and in men – 5603 (+17.1% since 2018) [9]. However, it must be highlighted that the IARC estimates above were prepared before the SARS-CoV-2 pandemic. Taking into consideration the results of our study, we can assume that the above epidemiological prognosis may be underestimated, particularly in light of the number of deaths for the discussed three cancer sites due to the multiplication of unfavorable effects such as: historically low participation in cancer screenings (exacerbated by the pandemic), an impaired system of fast treatment and diagnosis (the significantly lower number of issued ODaTCs, e.g. for breast cancer treatment – 4084 vs. 2730 in April 2019 and 2020), the constant increase in incidence, but also in mortality rates in cases of breast cancer [10] and colorectal cancer [11].

As mentioned before, available data on the impact of the SARS-CoV-2 pandemic on cancer deaths is still scarce and preliminary. However, some research and reports are available and indicate the possible direction of future changes. Maringe C. et al. in a population-based modeling study showed that in the United Kingdom (UK), due to delays in cancer diagnoses and treatment connected with the pandemic, a notable increase in the number of cancer deaths is expected in the future. Authors estimated that only for four cancer types – breast, colorectal, oesophageal and lung – approximate an increase in the number of additional cancer deaths in the next 5 years at the level of 3291–3621 [11]. In another study, Sud A. et al. indicates that in the UK during the lockdown, the number of patients who received referrals for urgent cancer treatment pathways decreased by about 84% in comparison with the pre-pandemic period [12]. In our study we also investigated substantial decreases in the number of patients with referrals to the fast path of oncological diagnosis and treatment, measured by the number of issued ODaTCs. Comparing January and April 2020, we noticed the following declines: breast cancer – 45%

(2235), cervical cancer – 72% (1249), colorectal cancer – 51% (2161). Despite the obvious differences between Polish and UK healthcare systems, results of our study suggest that we can expect a similar scenario on cancer deaths in Poland as in the UK.

Conclusions

1. Collected data suggests possible additional numbers of deaths from breast, colorectal and cervical cancer in Poland in the future.
2. There is a need to conduct urgent health policy evaluations aimed at reversing the unfavorable trend in cancer screenings, and treatment in order to stop or at least slow down expected increases in cancer deaths.
3. Special attention should be drawn to screening; despite the end of lockdown, population coverage and participation percentages are still lower than before the pandemic.
4. Combining the data from the National Cancer Registry and the National COVID-19 Registry in Poland is an unique opportunity to conduct high quality research on the consequences which the pandemic could have for Polish oncology.

Conflict of interest: none declared

Paweł Koczkodaj

*Maria Skłodowska-Curie National Research Institute of Oncology
Cancer Epidemiology and Primary Prevention Department
ul. Wawelska 15B
02-034, Warszawa, Poland
e-mail: pawel.koczkodaj@pib-nio.pl*

Received: 7 Oct 2020

Accepted: 2 Nov 2020

References

1. Didkowska J, Wojciechowska U, Czaderny K, et al. Nowotwory złośliwe w Polsce w 2017 roku. , Warszawa 2019: 43–44, 72–73.
2. Arbyn M, Weiderpass E, Bruni L, et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. *Lancet Glob Health.* 2020; 8(2): e191–e203, doi: 10.1016/s2214-109x(19)30482-6, indexed in Pubmed: 31812369.
3. Nowakowski A, Wojciechowska U, Wieszczy P, et al. Trends in cervical cancer incidence and mortality in Poland: is there an impact of the introduction of the organised screening? *Eur J Epidemiol.* 2017;

- 32(6): 529–532, doi: 10.1007/s10654-017-0291-6, indexed in Pubmed: 28780640.
4. Sowa A. ESPN – Flash report 2015/9. Shortening waiting times in oncology treatment. Directorate-General for Employment, Social Affairs and Inclusion, European Commission 2015: 5.
 5. Proposed Mission. Conquering cancer: mission possible. Directorate-General for Research and Innovation, European Commission. Publications Office of the European Union, Luxembourg 2020: 38.
 6. Data sourced from the National Health Fund in Poland. <https://www.nfz.gov.pl/dla-pacjenta/programy-profilaktyczne/dane-o-realizacji-programow/> (15.09.2020).
 7. Data sourced from the Maria Skłodowska-Curie National Research Institute of Oncology in Warsaw, Poland (on request) 11.09.2020.
 8. Data sourced from the National Health Fund in Poland (on request) 25.09.2020.
 9. Ferlay J, Ervik M, Lam F et al. Global Cancer Observatory: Cancer Tomorrow. International Agency for Research on Cancer, Lyon 2018. <https://gco.iarc.fr/tomorrow> (26.09.2020).
 10. Koczkodaj P, Sulkowska U, Gotlib J, et al. Breast cancer mortality trends in Europe among women in perimenopausal and postmenopausal age (45+). *Arch Med Sci.* 2020; 16(1): 146–156, doi: 10.5114/aoms.2019.85198, indexed in Pubmed: 32051718.
 11. Maringe C, Spicer J, Morris M, et al. The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. *Lancet Oncol.* 2020; 21(8): 1023–1034, doi: 10.1016/s1470-2045(20)30388-0, indexed in Pubmed: 32702310.
 12. Sud A, Torr B, Jones M, et al. Effect of delays in the 2-week-wait cancer referral pathway during the COVID-19 pandemic on cancer survival in the UK: a modelling study. *Lancet Oncol.* 2020; 21(8): 1035–1044, doi: 10.1016/s1470-2045(20)30392-2, indexed in Pubmed: 32702311.