Belgian Cancer Registry

Excess mortality among cancer patients during the COVID-19 period

up to March 2021

www.kankerregister.org I www.registreducancer.org

Geert Silversmit
Belgian Cancer Registry

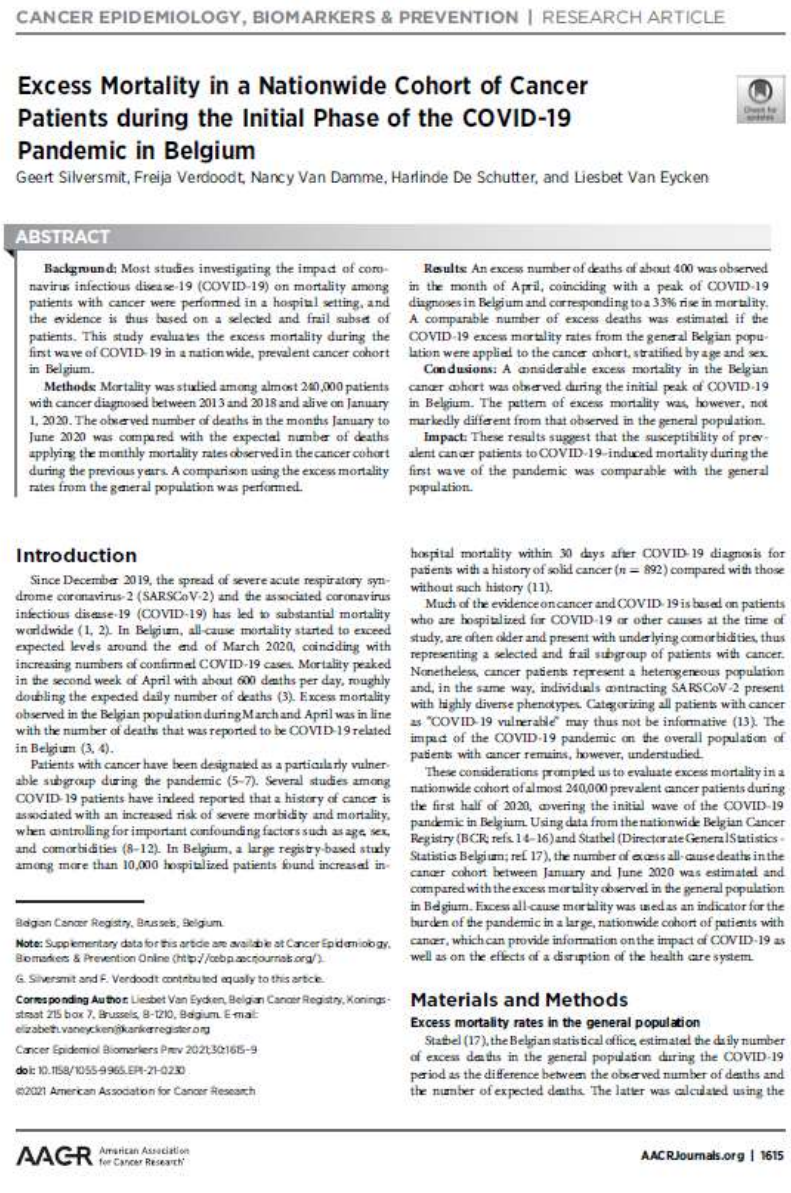
#HELICONference | Impact of the COVID-19 crisis on cancer care
January 12, 2022

Geert Silversmit,
Freija Verdoodt,
Nancy Van Damme,
Harlinde De Schutter,
Liesbet Van Eycken

Cancer Epidemiol Biomarkers Prev 2021, 30, p1615–1619

Support by:

Stichting tegen Kanker



Excess Mortality in a Nationwide Cohort of Cancer Patients during the Initial Phase of the COVID-19 Pandemic in Belgium

Geert Silversmit, Freija Verdoodt, Nancy Van Damme, Harlinde De Schutter, and Liesbet Van Eycken

ABSTRACT

Background: Most studies investigating the impact of coronavirus infectious disease-19 (COVID-19) on mortality among patients with cancer were performed in a hospital setting, and the evidence is thus based on a selected and frail subset of patients. This study evaluates the excess mortality during the first wave of COVID-19 in a nationwide, prevalent cancer cohort in Belgium.

Methods: Mortality was studied among almost 240,000 patients with cancer diagnosed between 2013 and 2018 and alive on January 1, 2020. The observed number of deaths in the months January to June 2020 was compared with the expected number of deaths applying the monthly mortality rates observed in the cancer cohort during the previous years. A comparison using the excess mortality rates from the general population was performed.

Results: An excess number of deaths of about 400 was observed in the month of April, coinciding with a peak of COVID-19 diagnoses in Belgium and corresponding to a 33% rise in mortality. A comparable number of excess deaths was estimated if the COVID-19 excess mortality rates from the general Belgian population were applied to the cancer cohort, stratified by age and sex.

Conclusions: A considerable excess mortality in the Belgian cancer cohort was observed during the initial peak of COVID-19 in Belgium. The pattern of excess mortality was, however, not markedly different from that observed in the general population.

Impact: These results suggest that the susceptibility of prevalent cancer patients to COVID-19–induced mortality during the first wave of the pandemic was comparable with the general population.

Introduction

Since December 2019, the spread of severe acute respiratory syndrome coronavirus-2 (SARSCoV-2) and the associated coronavirus infectious disease-19 (COVID-19) has led to substantial mortality worldwide (1, 2). In Belgium, all-cause mortality started to exceed expected levels around the end of March 2020, coinciding with increasing numbers of confirmed COVID-19 cases. Mortality peaked in the second week of April with about 600 deaths per day, roughly doubling the expected daily number of deaths (3). Excess mortality observed in the Belgian population during March and April was in line with the number of deaths that was reported to be COVID-19 related in Belgium (3, 4).

Patients with cancer have been designated as a particularly vulnerable subgroup during the pandemic (5–7). Several studies among COVID-19 patients have indeed reported that a history of cancer is associated with an increased risk of severe morbidity and mortality, when controlling for important confounding factors such as age, sex, and comorbidities (8–12). In Belgium, a large registry-based study among more than 10,000 hospitalized patients found increased in-hospital mortality within 30 days after COVID-19 diagnosis for patients with a history of solid cancer ($n = 892$) compared with those without such history (11).

Much of the evidence on cancer and COVID-19 is based on patients who are hospitalized for COVID-19 or other causes at the time of study, are often older and present with underlying comorbidities, thus representing a selected and frail subgroup of patients with cancer. Nonetheless, cancer patients represent a heterogeneous population and, in the same way, individuals contracting SARSCoV-2 present with highly diverse phenotypes. Categorizing all patients with cancer as "COVID-19 vulnerable" may thus not be informative (13). The impact of the COVID-19 pandemic on the overall population of patients with cancer remains, however, understudied.

These considerations prompted us to evaluate excess mortality in a nationwide cohort of almost 240,000 prevalent cancer patients during the first half of 2020, covering the initial wave of the COVID-19 pandemic in Belgium. Using data from the nationwide Belgian Cancer Registry (BCR; refs. 14–16) and Statbel (Directorate General Statistics - Statistics Belgium; ref. 17), the number of excess all-cause deaths in the cancer cohort between January and June 2020 was estimated and compared with the excess mortality observed in the general population in Belgium. Excess all-cause mortality was used as an indicator for the burden of the pandemic in a large, nationwide cohort of patients with cancer, which can provide information on the impact of COVID-19 as well as on the effects of a disruption of the health care system.

Materials and Methods

Excess mortality rates in the general population

Statbel (17), the Belgian statistical office, estimated the daily number of excess deaths in the general population during the COVID-19 period as the difference between the observed number of deaths and the number of expected deaths. The latter was calculated using the

Belgian Cancer Registry, Brussels, Belgium.

Note: Supplementary data for this article are available at Cancer Epidemiology, Biomarkers & Prevention Online (http://cebp.aacrjournals.org/).

G. Silversmit and F. Verdoodt contributed equally to this article.

Corresponding Author: Liesbet Van Eycken, Belgian Cancer Registry, Koningsstraat 215 box 7, Brussels, B-1210, Belgium. E-mail: elizabeth.vaneycken@kankerregister.org

Cancer Epidemiol Biomarkers Prev 2021;30:1615–9

doi: 10.1158/1055-9965.EPI-21-0230

Belgian Cancer Registry

Background

- Cancer patients and COVID-19:
  - increased risk for severe COVID-related morbidity and mortality
  - growing evidence base
  - often focus on patients with recent cancer diagnosis /active cancer treatment

- What about cancer survivors?

  = at least 1 year after diagnosis

Objectives

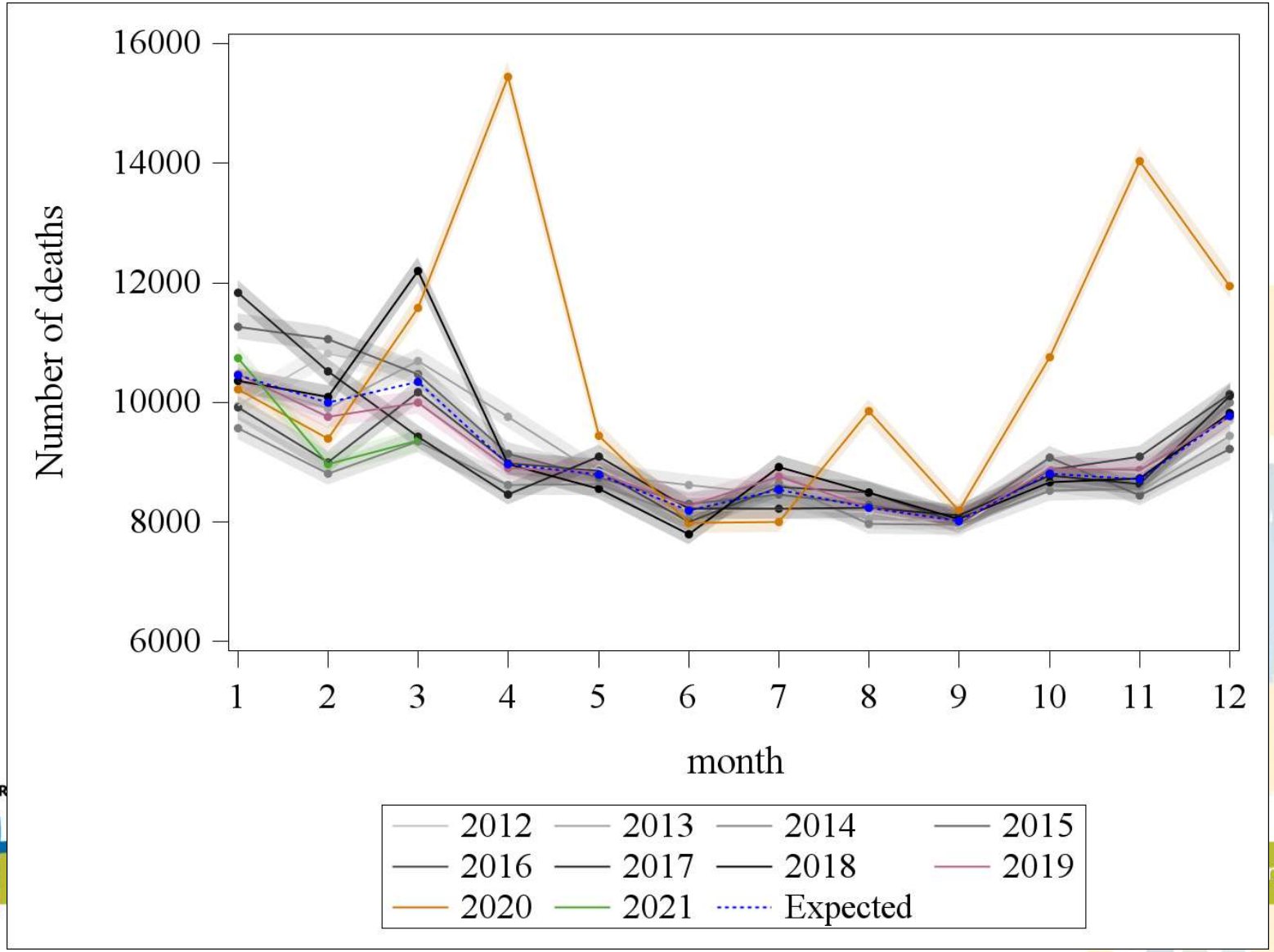
1. Estimate **excess mortality among cancer survivors** during the COVID-19 crisis, in Belgium, from mortality rates in cancer cohort prior to the COVID-19 period.

2. Compare excess mortality among cancer survivors with "***expected***" from excess mortality rates in general population

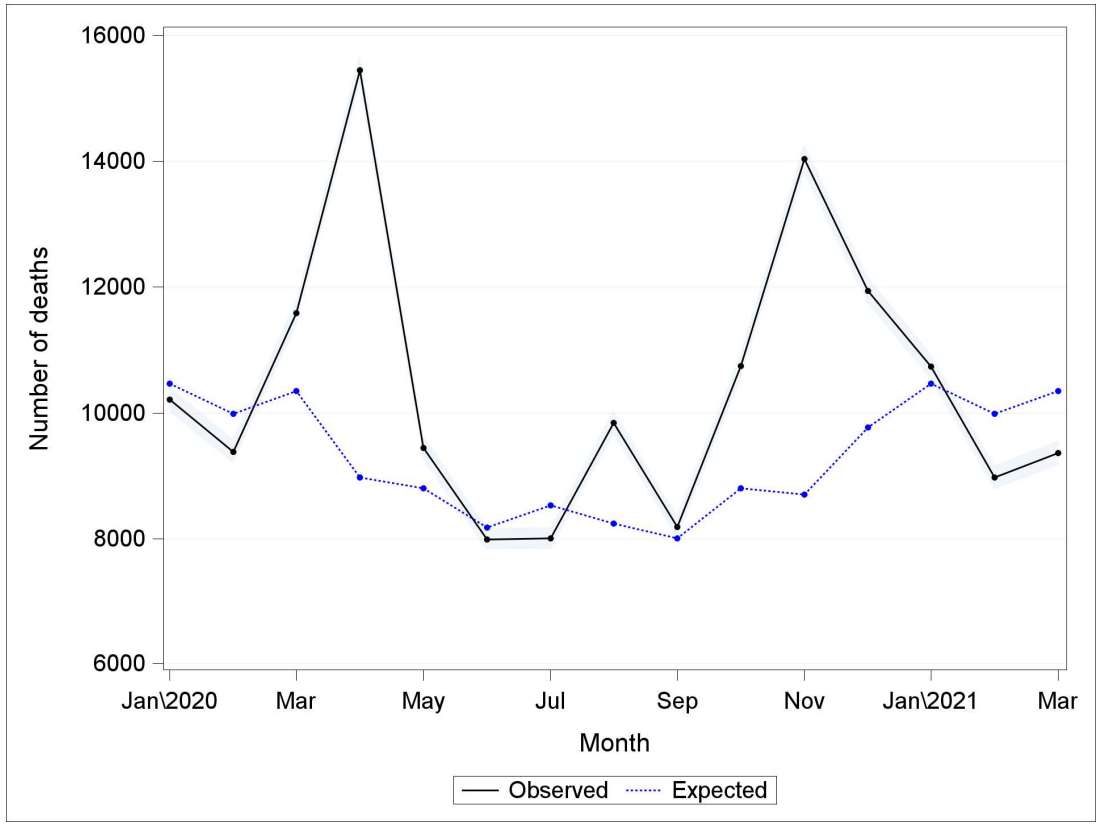
Mortality in Belgium, COVID-19 period

Sources: https://statbel.fgov.be/en/covid-19-statbel-data & vrtnws-Sciensano

Excess mortality, general population



Excess mortality, general population



Excess =
Observed - Expected

Expected per month:
- average 2012-2019

Excess rates stratified by
- Sex, age group

Statbel age groups: 0-24, 25-44, 45-64, 65-74, 75-84, 85+

Nationwide cohort of cancer survivors

Inclusion:

- primary cancer diagnosis in 2013-2018
- all invasive tumours, except non-melanoma skin cancers
- alive on January 1st, 2020

  N = 241,572

- cancer 'survivors'

Follow-up: Jan 1st, 2020 → March 31st, 2021

1. Observed excess mortality cancer cohort

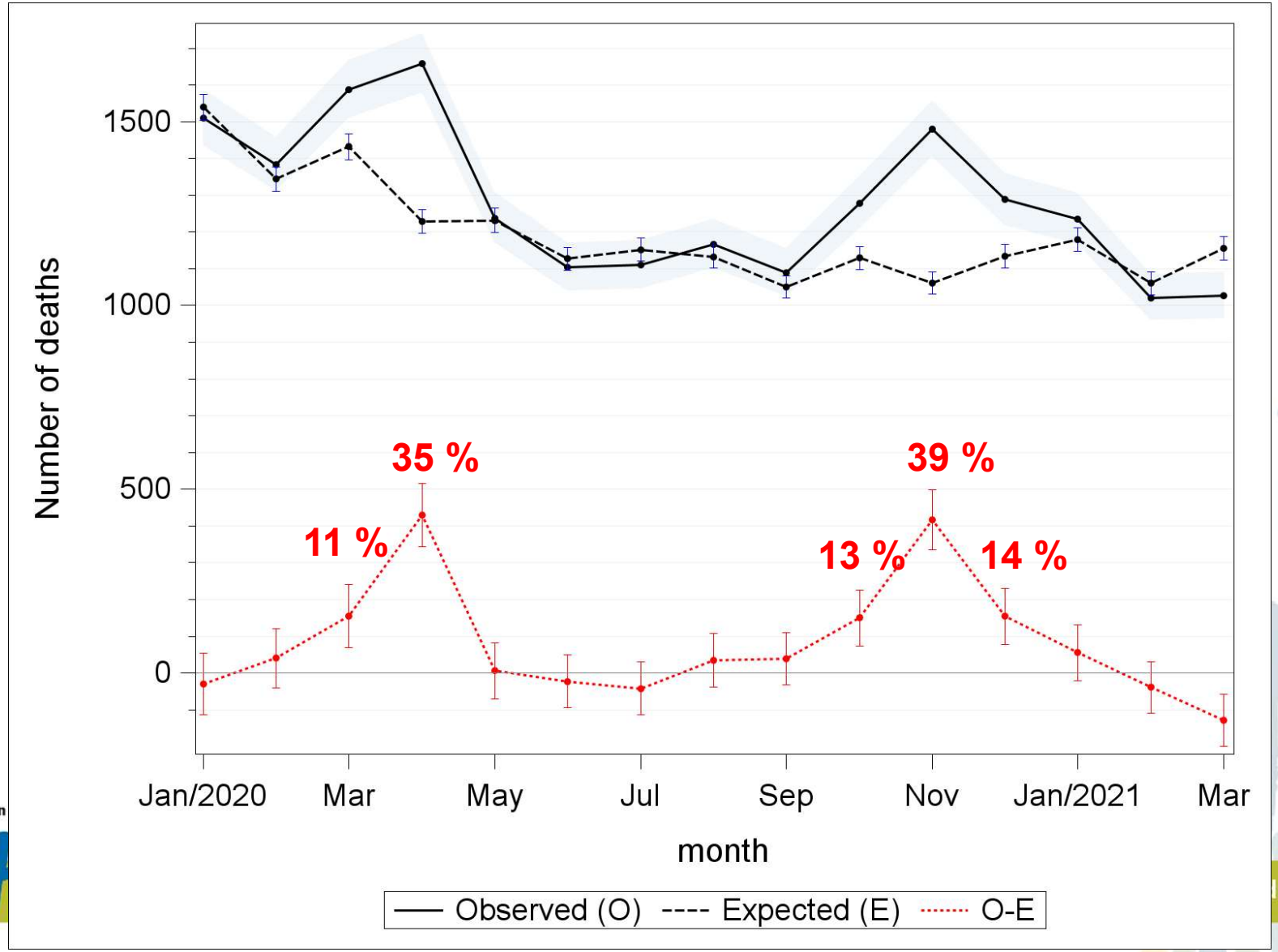
- Compare **observed** monthly number of deaths (2020,2021)

  with

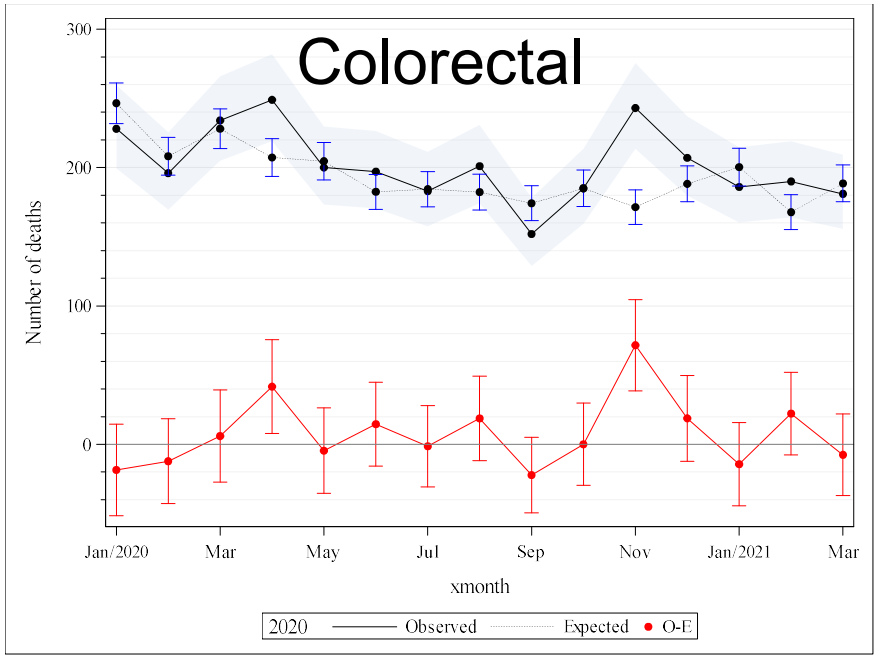
  expected monthly number of deaths in period 2011-2019

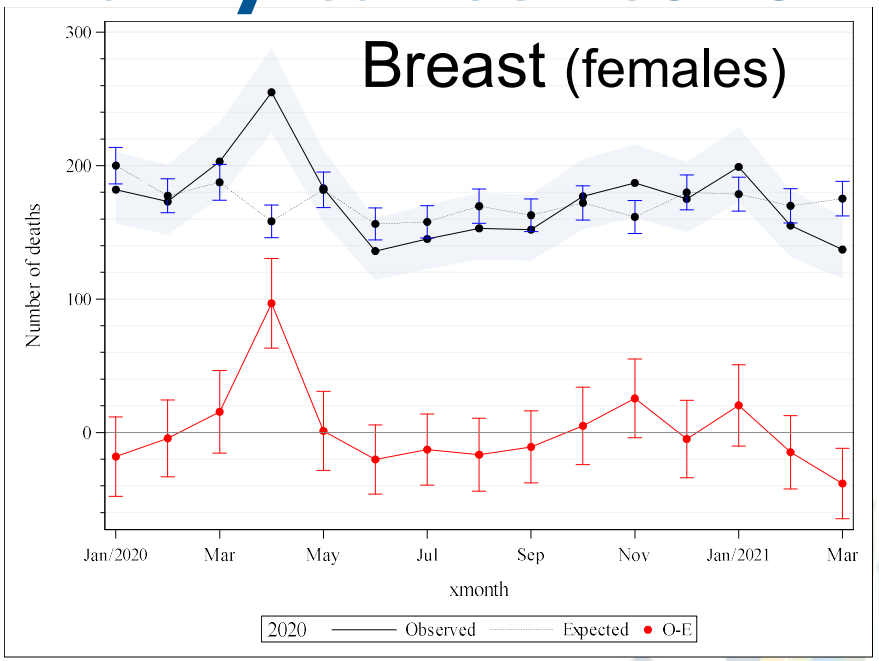
  stratified on : sex, age group, attained survival time

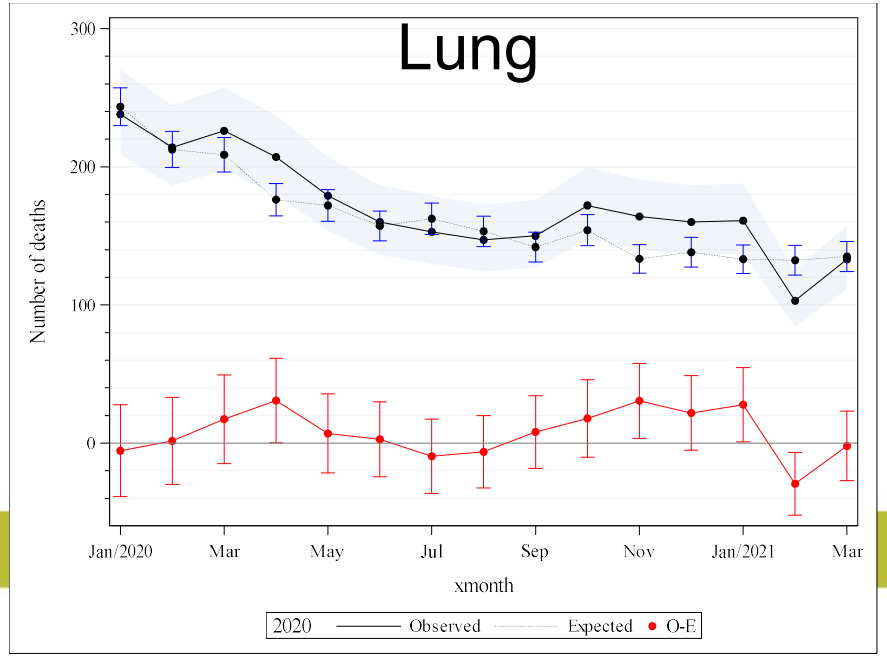
1. Observed excess mortality cancer cohort

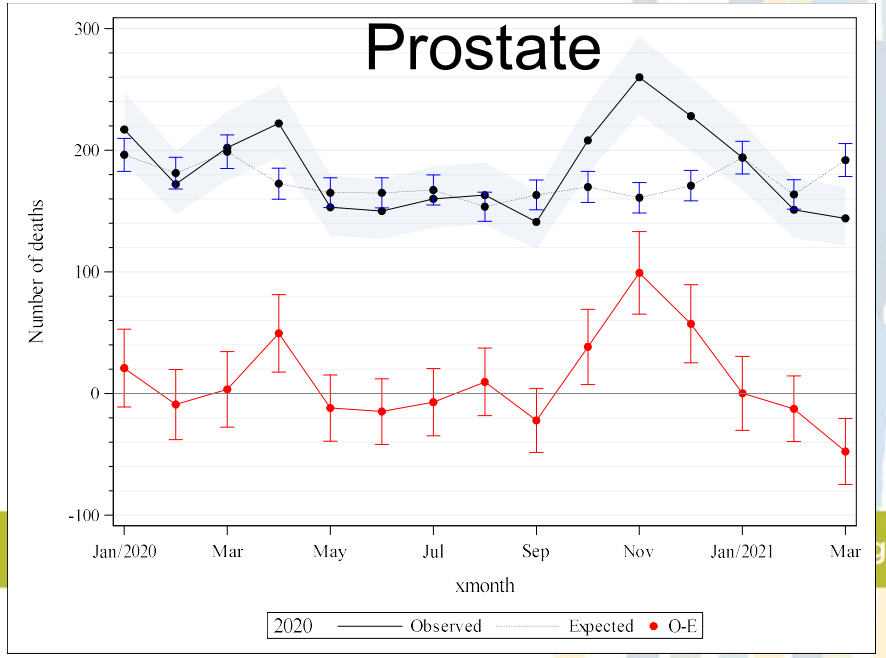


1. Observed excess mortality cancer cohort









2. Expected excess mortality cancer cohort

- Compare monthly number of **excess** deaths

  with

  monthly number of excess deaths when excess mortality rates of general population are applied to the cancer survivor cohort = **expected excess**

  stratified on: sex, age group, calendar month

2. Expected excess mortality cancer cohort

Expected from cancer cohort

Expected from excess mortality rates in general population

	Deaths		Excess deaths (O-E)		Expected excess deaths (O-E*)	
	O	E	Est.	95% CI	Est.	95% CI
All invasive tumours (N=241,572)						
2020 Jan-Dec	15,892	14,561	1,331	[1060, 1603]	1,222	[1174, 1271]
2020 March-April	3,245	2,660	585	[464, 707]	542	[519, 566]
2020 Oct-Dec	4,046	3,325	721	[585, 857]	613	[588, 637]

O: observed, E: expected, E*: expected excess deaths given excess mortality rates in general population (matched by sex, age)

2. Expected excess mortality cancer cohort

	Deaths		Excess deaths (O-E)		Expected excess deaths (O-E*)	
	O	E	Est.	95% CI	Est.	95% CI
Solid Tumours (N=215,517)						
2020 Jan-Dec	14,054	12,979	1,075	[820, 1330]	1,083	[1040, 1126]
2020 March-April	2,868	2,363	505	[391, 620]	480	[460, 501]
2020 Oct-Dec	3,523	2,962	561	[434, 687]	544	[522, 566]
Haematologic malignancies (N=27,775)						
2020 Jan-Dec	2,063	1,823	240	[142, 338]	150	[144, 156]
2020 March-April	425	341	84	[39, 128]	67	[65, 70]
2020 Oct-Dec	580	417	163	[112, 214]	74	[71, 77]

O: observed, E: expected, E*: expected excess deaths given excess mortality rates in general population (matched by sex, age)

Conclusions

- **Excess mortality among cancer survivors** in 2020

- Overall, pattern of excess mortality **not markedly different from general population**, taking age and sex into account
    - all-cause mortality (COVID, cancer, other)

- Conclusions should not be generalised to all cancer patients

Acknowledgements

- All physicians, pathologists and data managers involved in Cancer Registration in Belgium
- Staff of Belgian Cancer Registry
- Special thanks to:

  Freija Verdoodt, Nancy Van Damme,

  Harlinde De Schutter, and Liesbet Van Eycken

  (co-authors)