

Characteristics of Cancer Patients with COVID-19 in Arkansas

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We acknowledge the National Program of Cancer Registries, Centers for Disease Control and Prevention, for its support of the Arkansas Central Cancer Registry under cooperative agreement 17-1701 - NU58DP006343 awarded to Arkansas. The contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC or the Arkansas Department of Health.

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- Arkansas Family Physician Paper
- Linkage
- Results
- Pandemic Timeline of Events in Arkansas



Cancer Challenges Amid a Pandemic, and a Glimpse at Arkansas Data

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Introduction

Coronavirus disease 2019, better known as COVID-19, is the name of an illness by a novel (new) type of coronavirus. It was first identified in China, and by March 20, 2020 there were more than 234,000 cases confirmed worldwide, and more than 9,800 registered deaths.¹ Following the initial outbreak, the World Health Organization (WHO) labeled it a pandemic. COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This virus spreads through human-to-human transmission by repository droplets. There are many symptoms of COVID-19 which may appear 2 to 14 days after being infected.²

Those who have weakened immune systems can be at an increased risk of contracting COVID-19.³ This includes some cancer patients because of their weakened immune systems from the cancer itself, and its treatments like chemotherapy or a stem cell (bone marrow) transplant.² Cancer was deemed a risk factor for developing severe complications among COVID-19 patients, according to preliminary data analysis in China.⁴ However, those treated for cancer in the past are likely to have gained normal immune function back, and are, at this time, not at a higher risk but precautions should still be taken.² Precautions include regular handwashing, avoiding close contact, wearing a mask, covering a cough or sneeze, and cleaning and disinfecting surfaces. COVID-19 is a new virus, and there are continued efforts in learning the possible risks associated with cancer patients.

Screening and Treatment During COVID

Cancer screenings are important for reducing cancer mortality by removing precancerous lesions or detecting cancer at early stages when treatment is most effective. During the start of the COVID-19 pandemic, elective procedures, such as cancer screenings, were paused to help reduce the risk of transmission of COVID-19 in health

of John Hopkins University in Baltimore, the concern is not about the delay in a few months of cervical cancer screening, the concern is for institutions to form a plan to deal with a surge in screening and new cancer cases when screening restarts.⁵ She still recommends that providers track delayed screening and send reminders to their patients. Another concern is patients skipping their screening entirely. This could become problematic because exams, like mammograms, are usually performed every 2 years, and if skipped or missed, could result in up to 4 years between tests, which means potential tumors could be larger at presentation.⁵

There is also concern for treatment during this pandemic. During normal times, there is fear and anxiety that play a major role in the course of a patient's disease.⁶ A retrospective study that looked at the effect of fear on female breast cancer patients' decision-making process found that the fear of contracting COVID-19 could have a great impact on treatment refusals.⁶ Treatment refusals can lead to treatment delays, which may eventually result in an increase in locally advanced breast cancer rates over an extended period.⁶ To date, there is no reliable data that could show the effect of the delayed oncological treatment, but rather, we must make educated predictions so clinicians can be prepared. Though states are starting to lift restrictions, this pandemic is still affecting every aspect of health care - including the management of cancer patients. Treatment like radiotherapy can be safely delivered during the COVID-19 pandemic, and therefore should continue along with other treatments deemed safe.⁷ There must be a balancing act between the risk of COVID-19 and succeeding mortality and the increased risk of mortality from delaying cancer treatment.⁷ It is important that oncologists work together to determine the effects of delaying standard treatment, and then work on planning patient management effectively during this pandemic. At this time, screenings and elective procedures have resumed,

Source: Arkansas Family Physician - <https://www.arkansasafp.org/news/aafp-journal/>



Methods – Cancer Incidence Data



- A total of 390,885 cancer incidence records from 1996 - 2020 were used for the linkage.
- Cancer incidence data from 1996 - 2018 were complete according to NPCR standards, while 95% of 2019 (17,875) and 40% (8,004) of 2020 cancer incidence data were provisional at the time of the linkage – March 2, 2021.
 - Quality assurance processes (edits/consolidation) for 2019 and 2020 data were completed prior to the linkage.

Methods – COVID-19 Data



- A total of 343,269 COVID-19 records were used in the linkage.
- COVID-19 cases were identified from March 11th, 2020 through March 1st, 2021 using diagnostic results from polymerase chain reaction (PCR) and antigen tests, verbal positives from medical professionals and hospital staff, or death certificates without lab information.

Note: ADH, REDCap research electronic data capture, COVID-19, (<https://projectredcap.org/>).

Methods – Linkage Information



- A linkage was performed March 2nd, 2021.
- Match*Pro IMS software funded by the National Cancer Institute was used to perform the standard dual probabilistic linkage.¹ The following variables were linked: first name, last name, sex, race, birthdate, telephone, street address with city and zip code for Arkansas residents.

1. Fellegi I., Sunter, A. A Theory for Record Linkage. J Am Stat Assoc. 1969; 64(1): 1183-1210.

Methods – Linkage Results



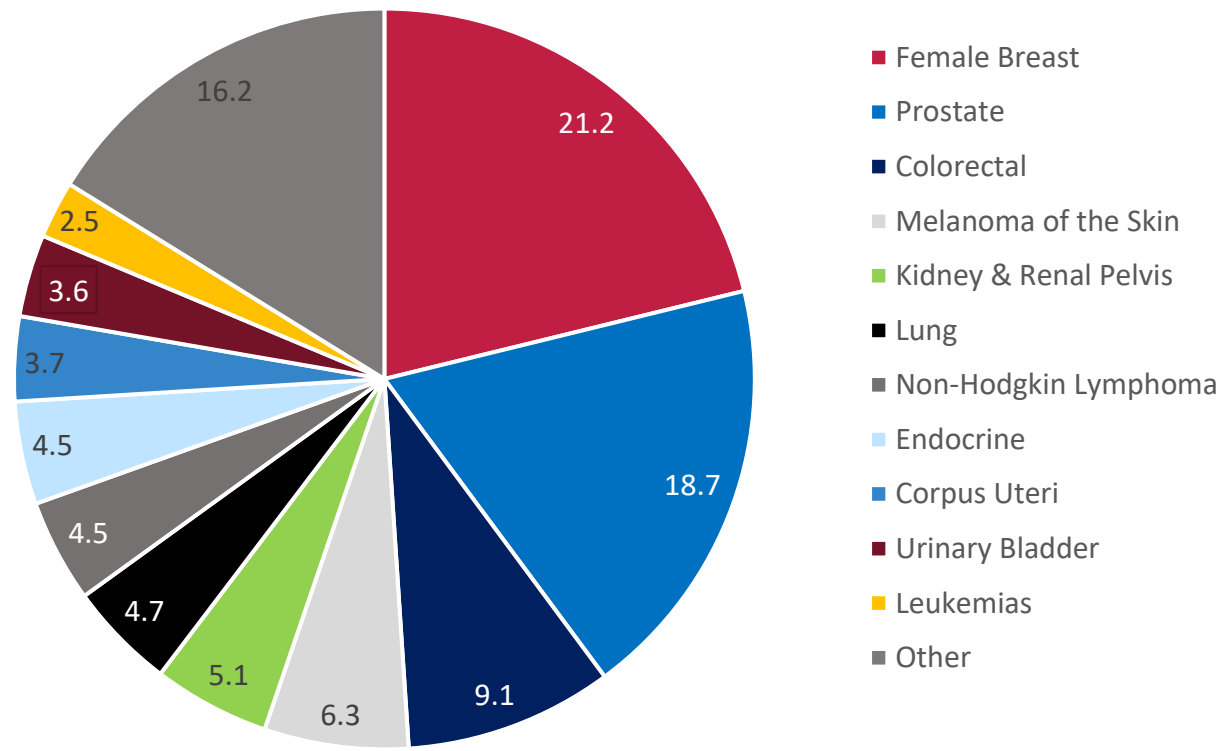
- The Cancer Registry dataset contains single patients diagnosed with more than one cancer.
- To evaluate tumor characteristics among matches, a file containing records for each incident tumor record was created. This was a de-identified set without patient information.
- When evaluating patient characteristics, a second file containing records for each patient was created. This set contained only patient information, regardless of the number of tumors the patient had.

Methods – Tumor Characteristics



- A total of 11,584 records (any type of invasive cancer or in-situ bladder cancer) matched with the COVID-19 dataset.
 - The COVID-19 data contains a single record for each patient with the first positive lab result. The only time there was a duplicate record is if the patient was reinfected at least 90 days from the initial diagnosis. There were 72 reinfections in the same patient and these were flattened to a single tumor entry.
 - These data were used to assess tumor characteristics among the matched cases. (n=11,512).

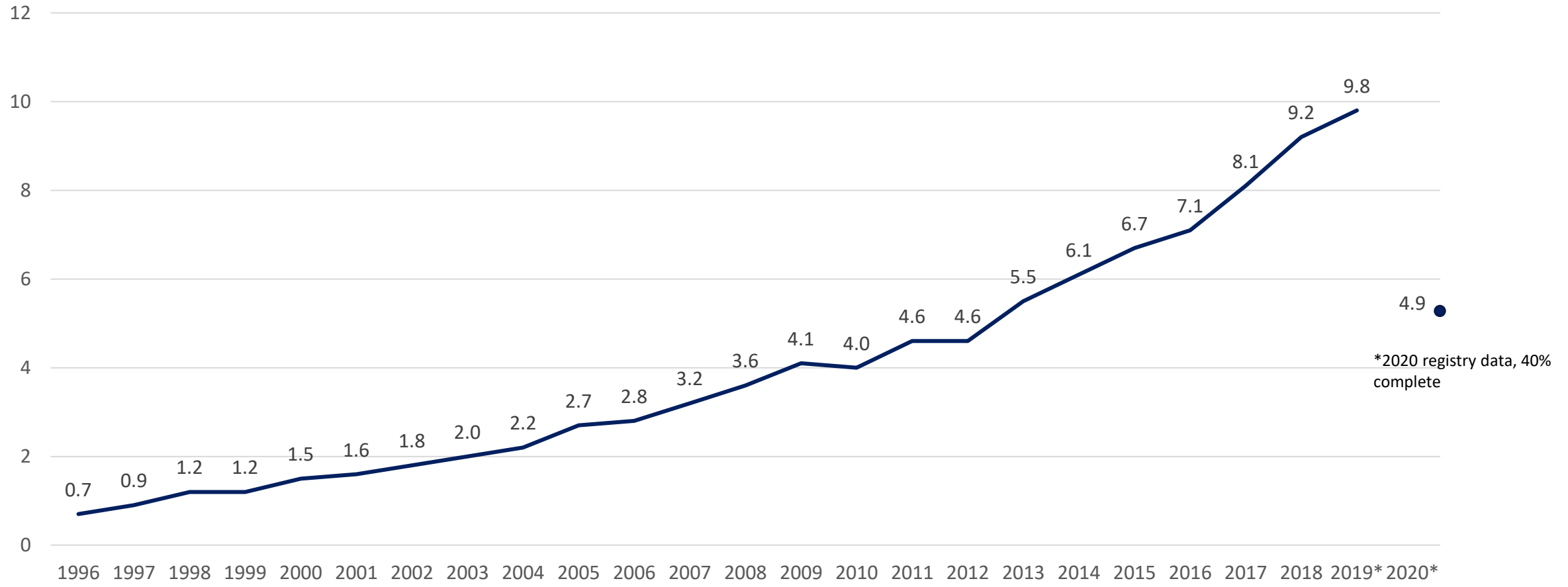
Percent of Cases Diagnosed with COVID-19 by Cancer Type, Arkansas



Source: ADH data includes cases diagnosed with cancer between 1996 – 2020 (provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=11,512)



Percent of Cases Diagnosed with COVID-19 by Cancer Dx Year, Arkansas



*2020 registry data, 40% complete

Source: ADH data includes cases diagnosed with cancer between 1996 – 2020 (*provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=11,512)

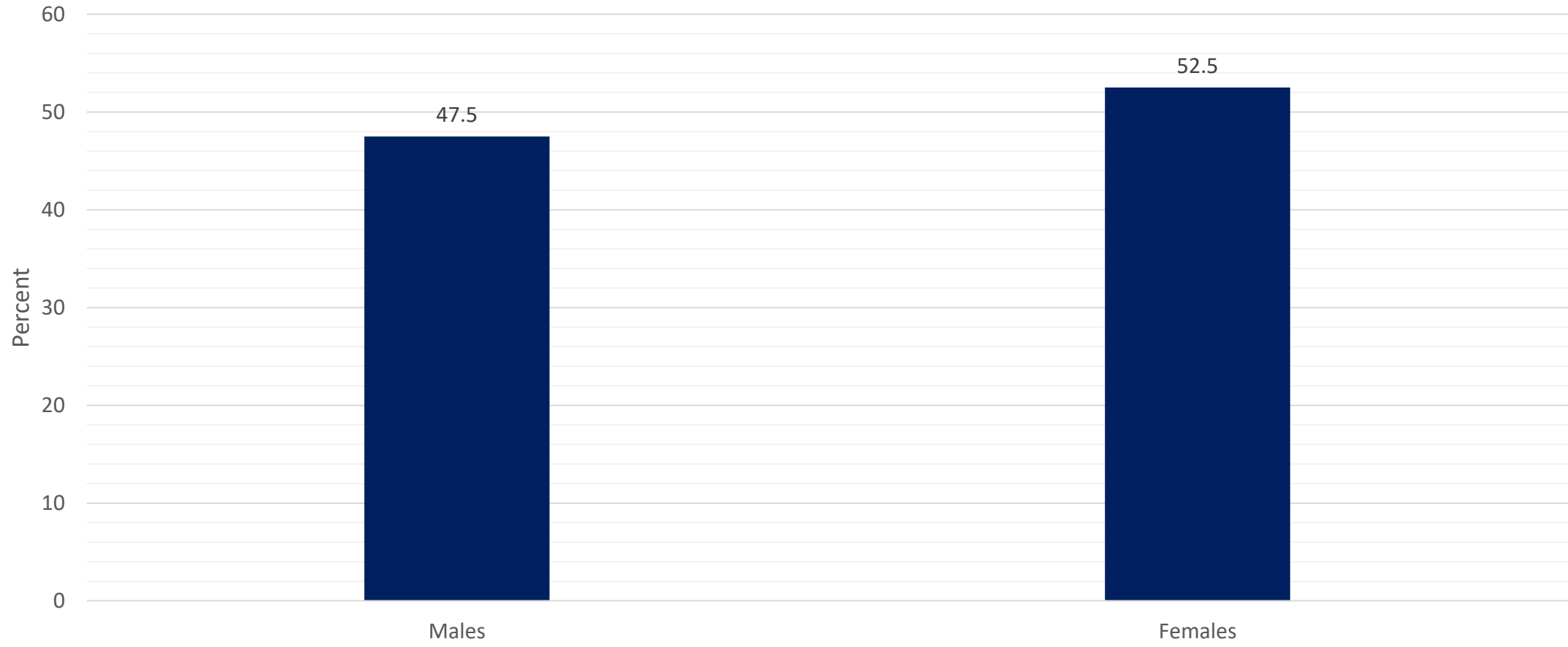
Methods – Patient Characteristics



- All data were flattened to a single patient to analyze demographics and COVID-19 outcomes among individuals (n=10,623).

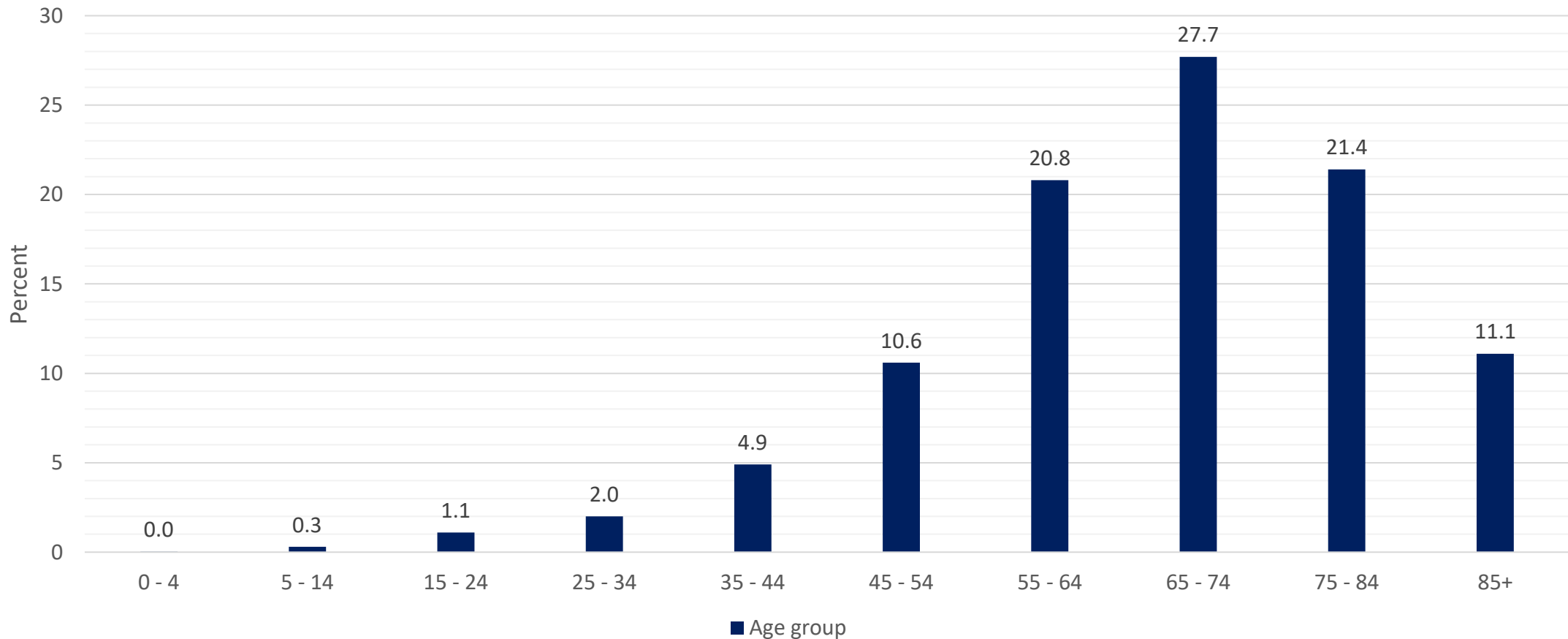


Percentage of Cancer Patients Diagnosed with COVID-19 by Gender, Arkansas



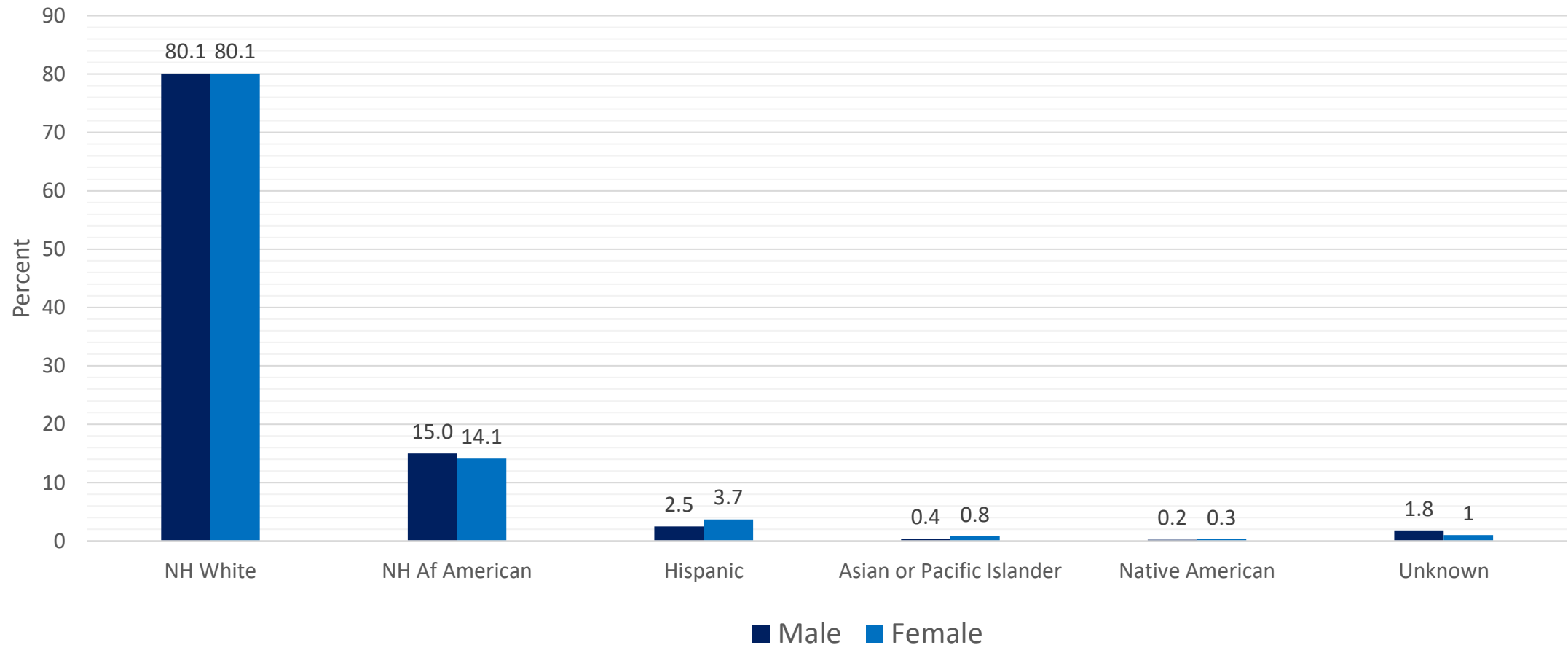
Source: ADH data includes patients diagnosed with cancer between 1996 – 2020 (provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=10,623)

Percentage of Cancer Patients Diagnosed with COVID-19 by Age-Group, Arkansas



Source: ADH data includes patients diagnosed with cancer between 1996 – 2020 (provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=10,622)

Percentage of Cancer Patients Diagnosed with COVID-19 by Gender and Race, Arkansas

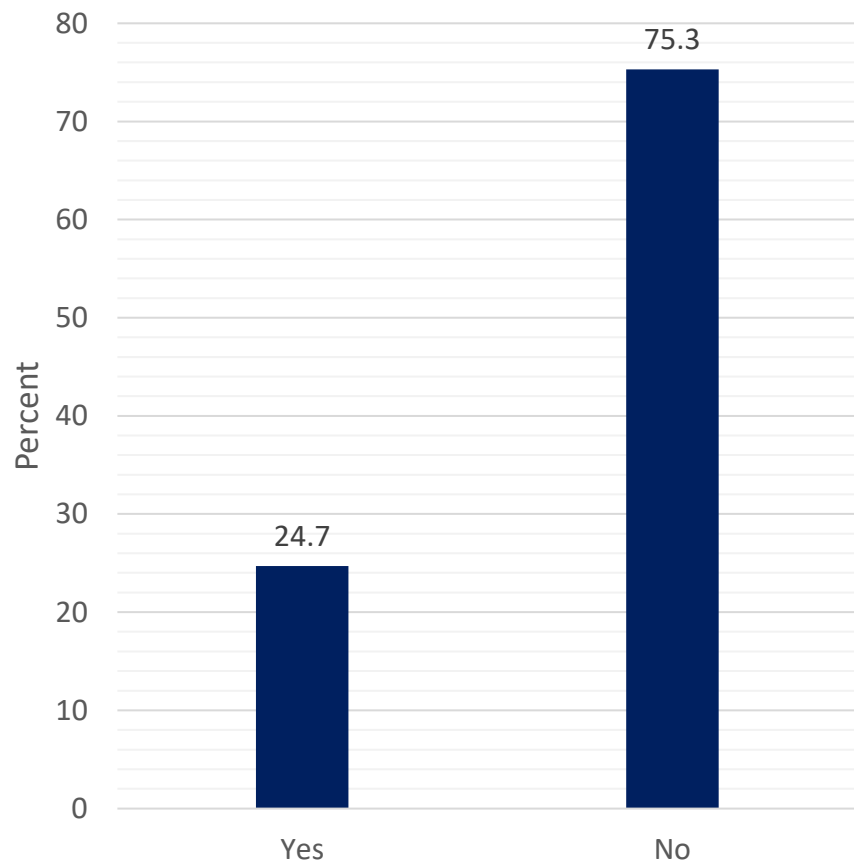


Source: ADH data includes patients diagnosed with cancer between 1996 – 2020 (provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=10,623)

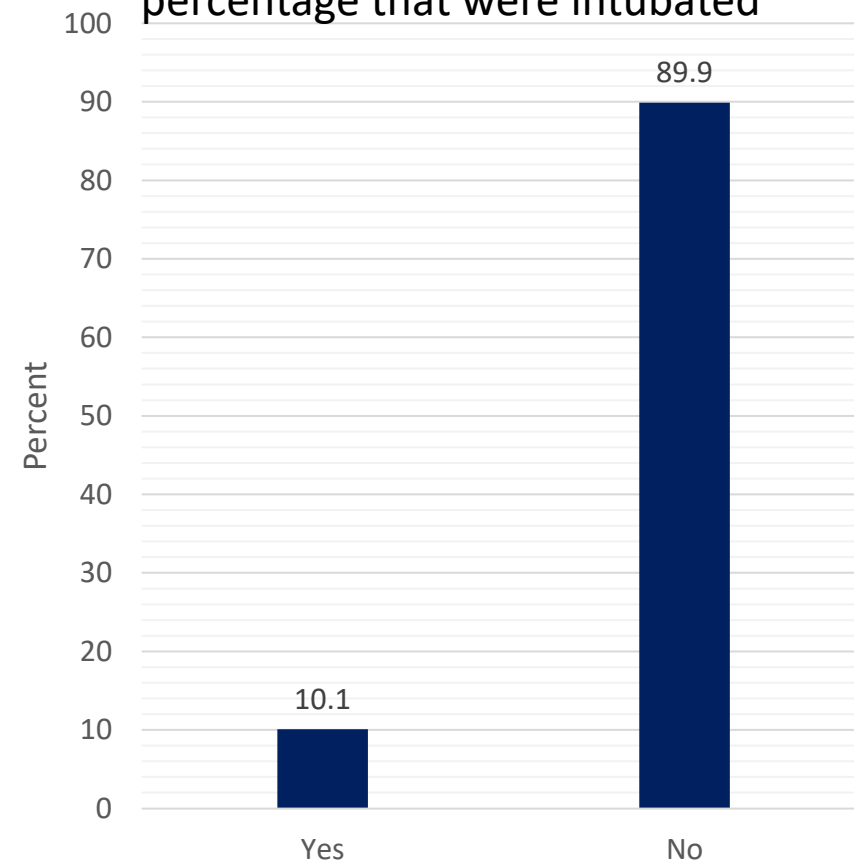
Percentage of Cancer Patients Diagnosed with COVID-19 and Hospitalized, Arkansas



Hospitalized



Of those hospitalized, percentage that were intubated



Source: ADH data includes patients diagnosed with cancer between 1996 – 2020 (provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=6,933)

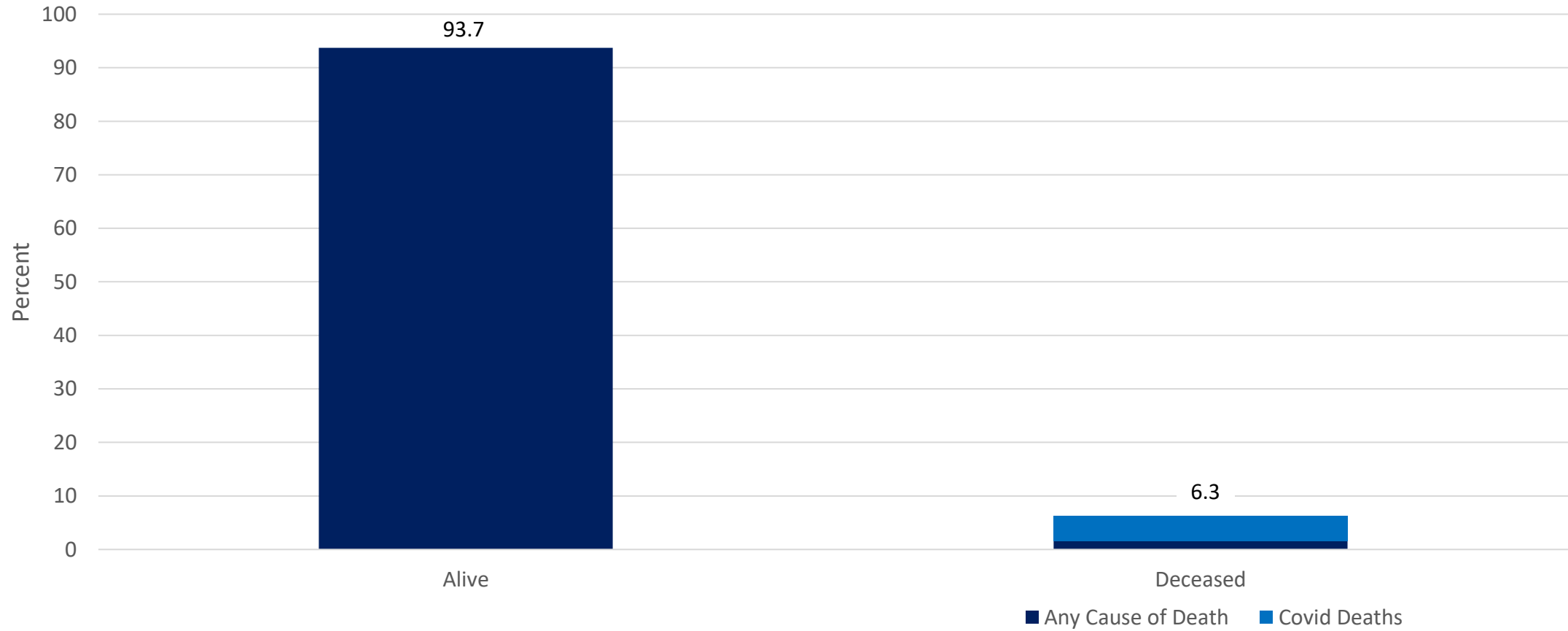
Methods – COVID-19 Deaths



- Death certificates from 2020 (provisional) were imported and linked with cancer incidence data from 1996 - 2020, March 2nd, 2021.
- ICD10 code U071 was used to identify COVID deaths (underlying and other causes of death) among the matched results.
 - Deaths = 672
 - Cancer survivors with COVID-19 as an underlying cause = 441
 - Cancer survivors with COVID-19 listed as an other cause of death = 64

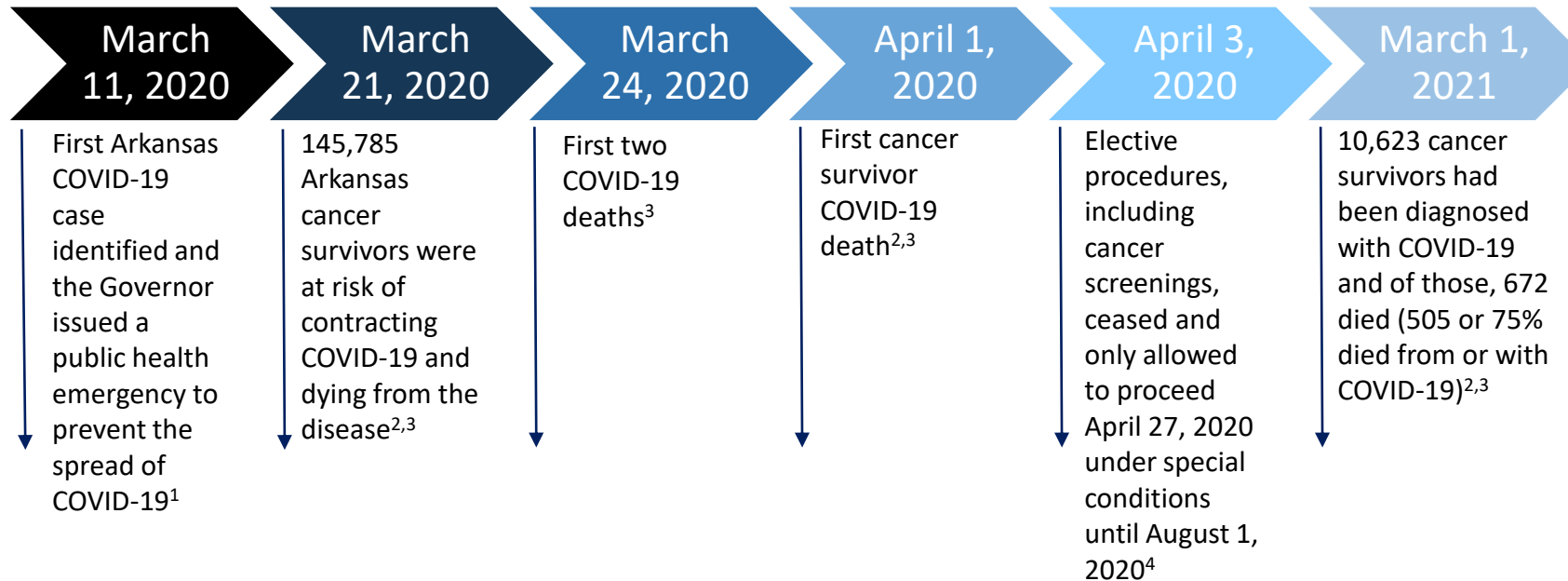


Percentage of Cancer Patients Diagnosed with COVID-19 by Vital Status, Arkansas



Source: ADH data includes patients diagnosed with cancer between 1996 – 2020 (provisional 2019 – 2020) and diagnosed with COVID-19 by March 1, 2021. (N=10,623)

Arkansas Timeline



1. State of Arkansas Proclamation. Executive Order to Declare an Emergency. https://governor.arkansas.gov/images/uploads/executiveOrders/EO_20-03_1.pdf Accessed March 10, 2021.
2. Arkansas Central Cancer Registry, Health Statistics Branch. Arkansas Department of Health. March 2, 2021.
3. Vital Statistics, Health Statistics Branch. Arkansas Department of Health. March 2, 2021.
4. Arkansas Department of Health. Directive on Resuming Elective Procedures <https://www.armedicalboard.org/Professionals/pdf/MedicalSpasAndElectiveProceduresUpdate.pdf> ; <https://files.constantcontact.com/7de60df4001/b7b129e4-efc5-4b44-b005-23c7daa43c9e.pdf> ; <https://files.constantcontact.com/7de60df4001/62ef4b5e-6f1c-4ec8-a867-3ce1d6ebcb63.pdf> Accessed March 10, 2021.

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