

The Patient Journey Prior to Cancer Diagnosis: A Cross-Sectional Observational Study of Provider Type Encounters Prior to Cancer Diagnosis

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INTRODUCTION

- The US currently does not have established cancer diagnostic pathways which often results in diagnostic routes being lengthy and complicated, especially for patients with non-specific signs and symptoms. Therefore, patients could be diagnosed at advanced stages, which is associated with worse clinical outcomes and increased economic burden.
- A recent qualitative study in lung cancer found that multiple routes to diagnosis produced perceived delays, inefficiencies, lack of coordination and ultimately added patient distress (Achkar et al 2020).
- In comparison to the US, England has established guidance and continues to identify pathways to improve early-stage diagnosis such as the SCAN pathway for patients with non-specific symptoms (<https://pathways.nice.org.uk/pathways/suspected-cancer-recognition-and-referral>, Emery et al 2015, Nicholson et al 2018)
- Literature supports the belief that patients diagnosed with different cancers often incur varying times to diagnosis because of missed diagnostic opportunities (Frie et al 2018, Shen et al 2018, Koshiaris et al 2018)
- Limited evidence is available in the US and internationally documenting the patients' experiences, especially the physicians' encounters during the diagnosis process across all tumor types.

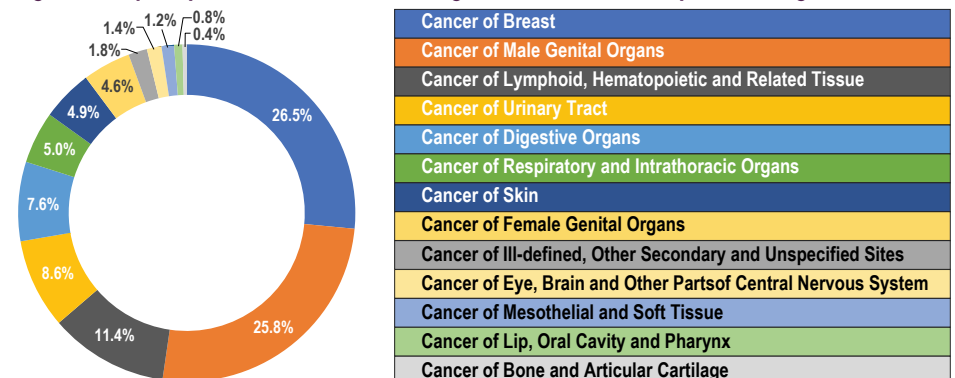
OBJECTIVE

- This study sought to provide insight regarding the types and frequencies of healthcare providers encountered in the three months preceding a cancer diagnosis in the US.

MAJORITY OF PATIENTS VISITED MULTIPLE TYPES OF PROVIDERS DURING 3 MONTHS PRIOR TO CANCER DIAGNOSES, INCLUDING SPECIALISTS, HIGHLIGHTING THE NEED FOR STREAMLINING CANCER DIAGNOSIS PATHWAYS.

- Among the 5.2 million members in the database, 81,534 patients were newly diagnosed with cancer in 2019. The most prevalent cancer types were breast cancer (27%), cancer in male genital organs (26%), and lymphoid, hematopoietic, and related tissue cancer (11%) (Figure 2).

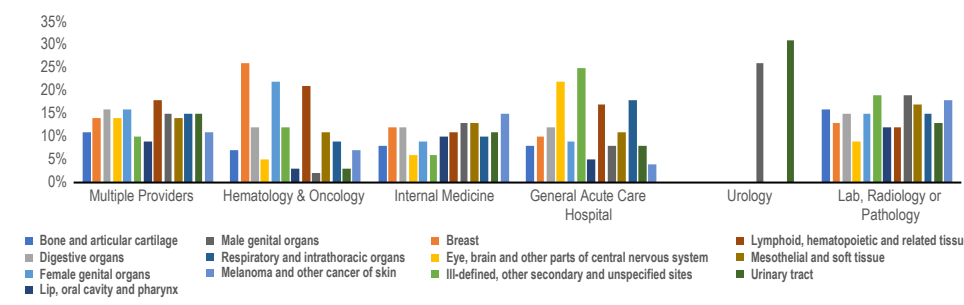
Figure 2. Frequency distribution of cancers diagnosed between January 2019 through December 2019



The legend lists cancers in the order of highest to least contributing cancers

- Figure 3 presents the distribution of physician types who had claims on the same days of cancer diagnoses by cancer type:
 - 8%-25% of cancer diagnoses were associated with physicians from internal medicine or general acute care hospital.
 - Non-trivial proportions of cancer diagnoses (9-16%) were associated with multiple physician types, highlighting the complexity of cancer diagnoses.
 - Of these, the top 3 most common combinations of provider categories seen on diagnosis claims across tumor types included medical oncologist and general hospital (9.5%), pathologist and general hospital (6.2%) and independent laboratory and medical oncologist (4.7%).
 - 3%-13% of cancer diagnoses were associated with independent lab physicians, radiologists, or pathologists.
 - Hematologists and oncologists dominated breast cancer (26%) and female genital organ cancer diagnoses (22%).
 - Urologists dominated diagnoses of cancers of male genital organs (26%) and urinary tract (31%).

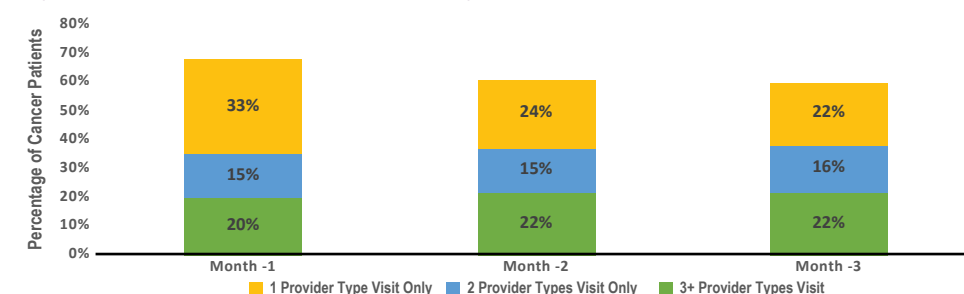
Figure 3. Distribution of physician types who had claims on the same days of cancer diagnoses by cancer type



- Figure 4 presents the providers visited during the 3 months prior to cancer diagnosis:

- Visits to providers in the months leading up to cancer diagnoses were common. Specifically, 60% had visits in the 3rd and 2nd month prior to, and 68% in the 1st month prior to diagnosis.
 - In the month prior, 71% of patients with any provider encountered visited ≥ 2 provider types and 49% visited ≥ 3 provider types
 - These proportions varied by cancer type, ranging from 61% of pts with cancers of male genital organs to 82% of pts with cancers of ill-defined, other secondary and unspecified sites visited ≥ 2 provider types (data not shown in figure).

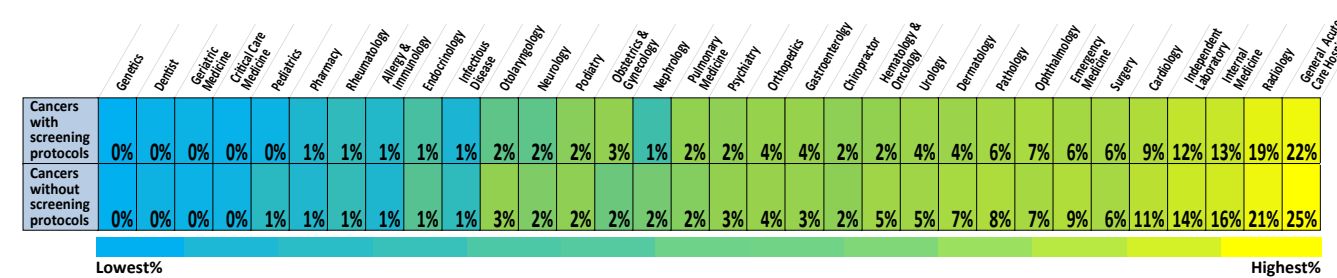
Figure 4. Provider type visits before cancer diagnosis



- Even back to 3 months prior to diagnosis, almost 1/5 (19%) of diagnosed patients visited a specialist type of interest and this rate increased to 28% in the 1 month prior to diagnosis. In addition, 14% were visiting ≥ 2 types of specialist types of interest during the 3 months prior to cancer diagnosis (data not shown in figure).

- During 1 month prior to diagnosis, patients diagnosed with cancers without screening protocols were seen to visit more diversified types of providers than cancers with screening protocols (Figure 5). Similar trends were seen in 2nd and 3rd month prior to diagnosis.

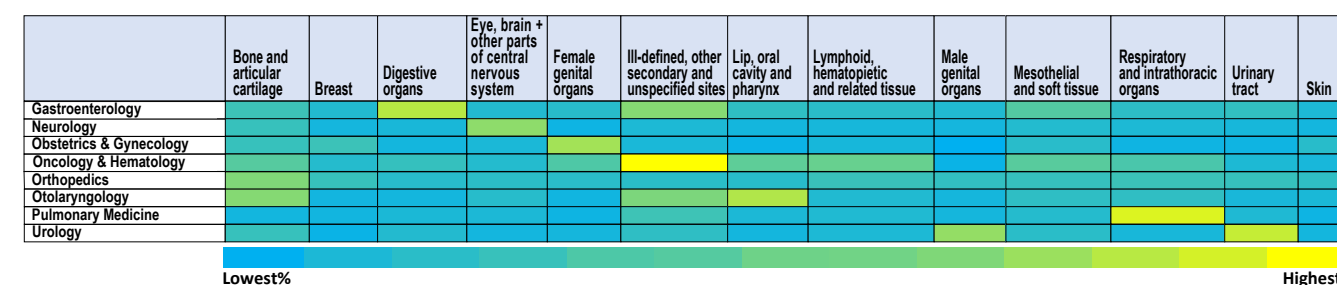
Figure 5. Proportion of patients visiting a specific provider type during 1 month prior to cancer diagnosis for cancers with vs. without recommended screening protocols



According to USPSTF guidelines, we included cancers of the breast, digestive organs, female and male genital organs and respiratory organs as cancers with screening protocols and the remainder with those that do not

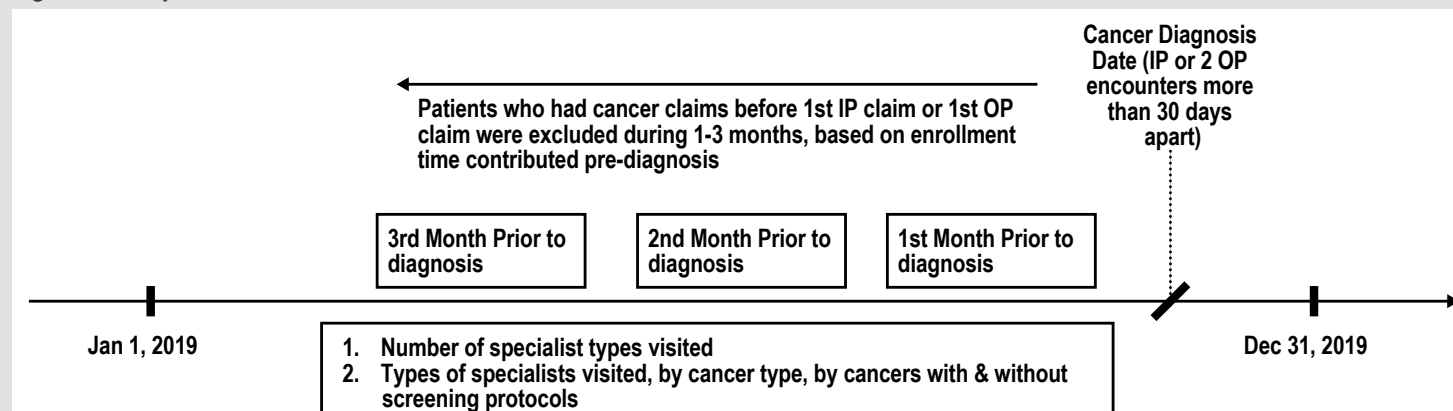
- In each month prior to cancer diagnosis, some specialist types of interest were seen more than others for certain cancer types. Specifically, in the one month prior to diagnosis, 15% of respiratory cancer patients visited providers in the pulmonary medicine specialty; 12% of oral cancer patients visited otolaryngologist and 17% of patients who had cancers in unspecified sites had seen oncologist & hematologists (Figure 6). Similar trends were seen in the 2nd and 3rd month prior to cancer diagnosis.

Figure 6. Proportion of patients visiting specialist types of interest during 1 month prior to cancer diagnosis by type of cancer



METHODS

Figure 1. Study Schema



Data Source and Design

- A retrospective analysis using Optum® de-identified Electronic Health Record dataset (2019) with Enriched Oncology, which includes commercially insured and Medicare Advantage members.

Population and Inclusion Criteria (Figure 1)

- Patients newly diagnosed with cancer in 2019. Cancer diagnosis was determined using cancer-specific ICD-10 codes requiring ≥ 1 inpatient or ≥ 2 outpatient encounters more than 30 days apart. The diagnosis date was the first inpatient or first outpatient encounter date.
- Patients aged 18+ on cancer diagnosis date.
- Patients without cancer claims during 1-3 months prior to the cancer diagnosis based on enrollment time contributed pre-diagnosis

Analyses

- Cancer type distributions and diagnosing physician types were summarized. Diagnosing physicians were defined as the physicians who filed claims for the patients on the same date of the cancer diagnosis claim.
- Percentages of patients visiting any healthcare providers (e.g., internists, surgeons, radiologists, critical care physicians, specialists) and number of provider types visited during the 1st, 2nd, and 3rd month prior to cancer diagnosis were summarized descriptively by cancer type.
- A subgroup analysis of specific specialists (i.e., gastroenterology, neurology, obstetrics & gynecology, oncology & hematology, orthopedics, otolaryngology, pulmonary medicine, and urology) was also explored and summarized during the 1st, 2nd the 3rd month prior to cancer diagnosis.

SUPPORTING INFORMATION

LIMITATIONS:

- We utilized provider category codes in the prior months while estimating mean percentage of patients that visited a certain specialist or provider. However, we do not have enough information from the data to know what the visit was about – whether it was follow up on a treatment, non-specific symptom or a workup test.
- Given the analyses are cross-sectional in nature, patients in 3rd, 2nd and 1 month pre-diagnosis could be different, which makes the aggregate across three months impossible. Future analysis should be conducted on the subgroup of patients who had at least 3 months' continuous enrollment prior to cancer diagnosis.

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