

# Factors Associated with Preventive Cancer Screening Among Diabetic Patients as Compared to Their Non-Diabetic Counterparts

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The observed relationship between diabetes and cancer has drawn experts' interest because the two are often both diagnosed in an individual. While their specific relationship is rather complex, similar risk factors can likely explain their co-diagnosis. With age alone being a significant risk factor, the United States must prepare for challenges that its sizeable aging population will face.

Despite the risks associated with diabetes and cancer, existing literature lacks a systematic assessment of preventative measures exercised by patients with diabetes, specifically with their cancer screening practices for prevention.<sup>1</sup> Persons with diabetes have a higher risk for cancer and a poorer prognosis after diagnosis, so they must participate in proper preventative methods to improve their health outcomes. This study investigated cancer screening practices of patients with and without diabetes between 2012-2018 to understand their health behaviors. An unweighted population of 1,838,563 respondents was included in the original data set before our analysis.

We examined screening rates for four major cancer types, including colorectal (sigmoidoscopy), breast (mammogram), cervical (Pap/HPV test), and prostate (PSA test) cancers using data from the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is the nation's premier system of telephone surveys that collect state-level data about health risk behaviors, chronic health conditions, and the use of preventive services. We identified our study population using clinical guidelines established by the American Cancer Society (ACS) and only included respondents that fell into the standard biological sex and age recommendations for each screening. This included 1,330,658 males and females examined for colorectal cancer screening, 783,104 females for breast cancer screening, 782,713 females for

cervical cancer screening using the Pap Test, 733,720 females for cervical cancer screening using the HPV test, and 548,119 males for prostate cancer screening.

At a national estimate, we found that persons with diabetes had a screening for each cancer at a higher rate than those without diabetes, except HPV test utilization used for cervical cancer prevention (Figure 1). While this population had higher cancer screening rates, these percentages do not always reach the national benchmarks for these practices. For example, in 2018, the cervical cancer screening rate using the HPV test was 37.48% for patients with diabetes and 46.43% for patients without diabetes compared to the national target of 80.5%.<sup>2</sup>

We also assessed if any regional disparities were present for each screening. After categorizing each respondent as living in the Northeast, South, West, or Midwest regions, we decided to narrow our focus to the states that can be defined as the "Deep South," including Alabama, Georgia, Louisiana, Mississippi, South Carolina, and Tennessee. Additionally, several factors that potentially influence the cancer screening behavior of these groups were identified, including race, sex, age, education, metropolitan status, employment, income, healthcare coverage, marital status, veteran status, general health, and ability to visit a physician's office alone.

We are currently in the process of analyzing each type of cancer screening using these parameters. These methods include running a logistic regression model to identify which factors have significantly impacted the screening practices of persons with diabetes. Our findings will serve as critical contributions to providers' knowledge about how to implement proper preventative behaviors for the most vulnerable populations of these patients. This information will allow for the ex-

ploration of appropriate initiatives to increase screening rates among these populations.

### Statement of Research Advisor

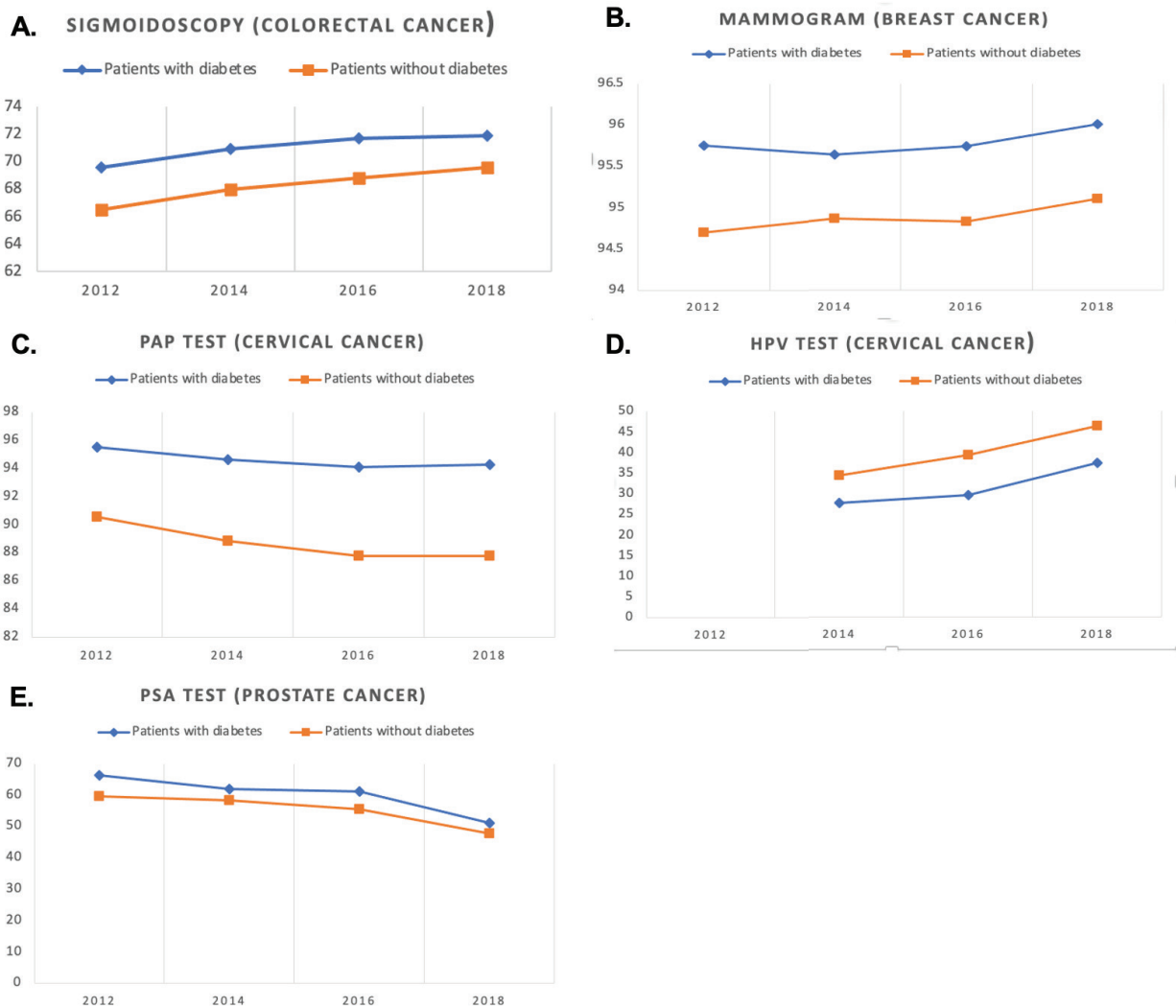
Hayleigh’s work aims to make greater strides in cancer prevention and early detection for individuals with an increased risk of cancer through a thorough examination of cancer screening practice among persons with diabetes. Her work also helps identify disparities in cancer screening observed in the Deep South of the U.S., and the findings will serve as foundational knowledge for policymakers and stakeholders to plan cancer screening and prevention strategies for the nation.

– Chiahung Chou, Ph.D., Harrison School of Pharmacy, Health Outcomes Research and Policy

### References

<sup>1</sup> Porter NR, Eberth JM, Samson ME, Garcia-Dominic O, Lengerich EJ, Schootman M. Diabetes status and being up to date on colorectal cancer screening, 2012 Behavioral Risk Factor Surveillance System. *Prev Chronic Dis.* 2016; 13:150391.

<sup>2</sup> Healthy People. Increase the proportion of women who receive a cervical cancer screening based on the most recent guidelines. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/cancer/increase-proportion-females-who-get-screened-cervical-cancer-c-09>.



**Figure 1.** (A) Patients with diabetes are completing sigmoidoscopies at a higher rate than patients without diabetes. (B) Patients with diabetes are completing mammograms at a higher rate than patients without diabetes. (C) Patients with diabetes are completing Pap tests at a higher rate than patients without diabetes. (D) Patients with diabetes are completing HPV tests at a lower rate than patients without diabetes. (E) Patients with diabetes are completing PSA tests at a higher rate than patients without diabetes.