The Association of HIV and Other Risk Factors with Triple-Negative Breast Cancer in South African Women (Gauteng and KwaZulu-Natal Provinces, South Africa)

Student: Jacob Dubner (Vagelos College of Physicians and Surgeons, Class of 2025)
Columbia University Mentors: Yoanna Pumpalova, MD and Alfred Neugut, MD, PhD

BACKGROUND

- Breast cancer is the most common malignancy diagnosed in woman in South Africa
- Breast cancer mortality in South Africa is more than double that of the United States
- Triple-negative breast cancer (TNBC) is the most aggressive and most lethal subtype of breast cancer
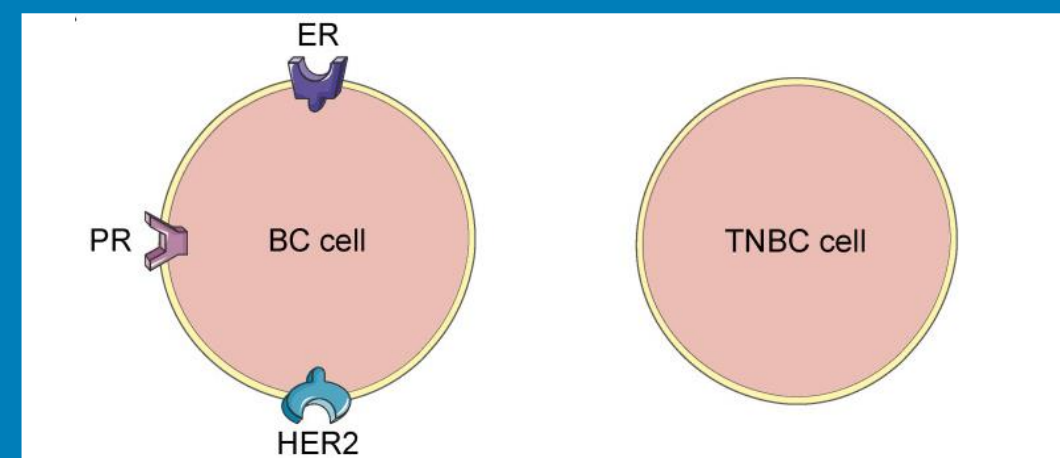

Fig. 1: Non-TNBC vs TNBC cells

SOUTH AFRICAN BREAST CANCER HIV OUTCOMES (SABCHO) STUDY

- Prospective cohort of +5,000 South African breast cancer patients enrolled since 2015
- Collaboration between Columbia University, University of Witswatersrand, and University of KwaZulu-Natal

Fig. 2: Map of SABCHO study hospital locations

RESEARCH QUESTION

Does HIV positive status and/or degree of HIV control affect the risk of developing triple-negative breast cancer relative to other breast cancer subtypes among South African women?
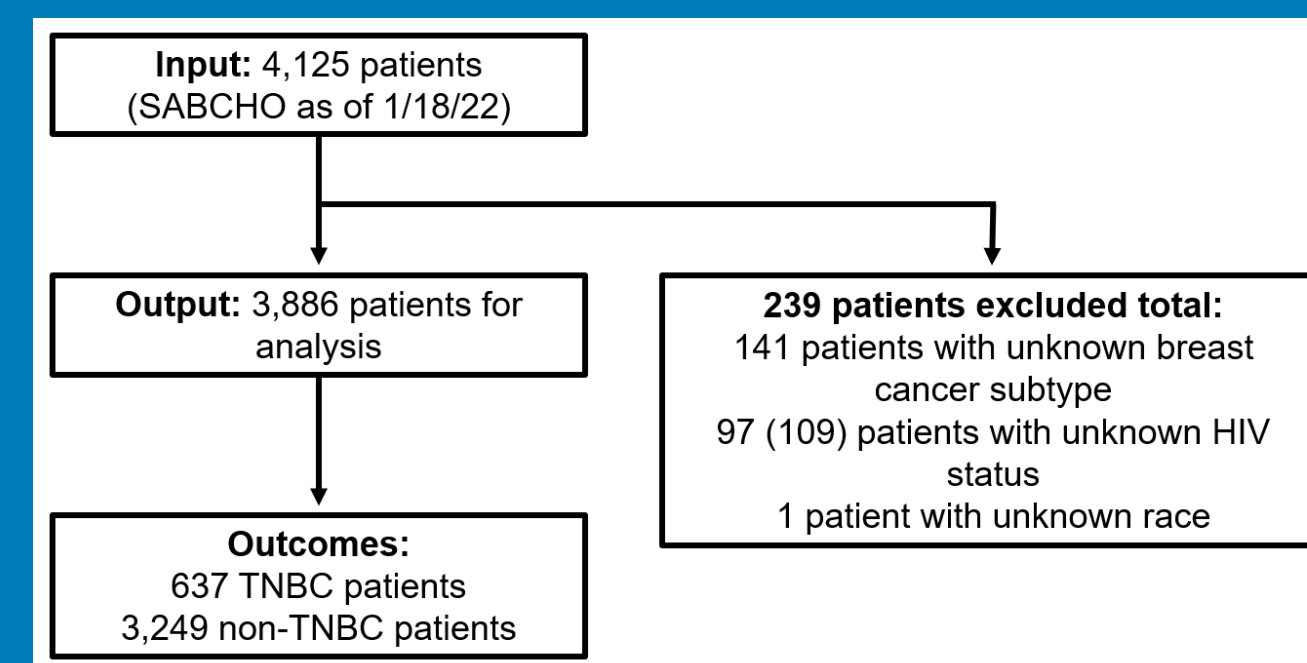
RESULTS

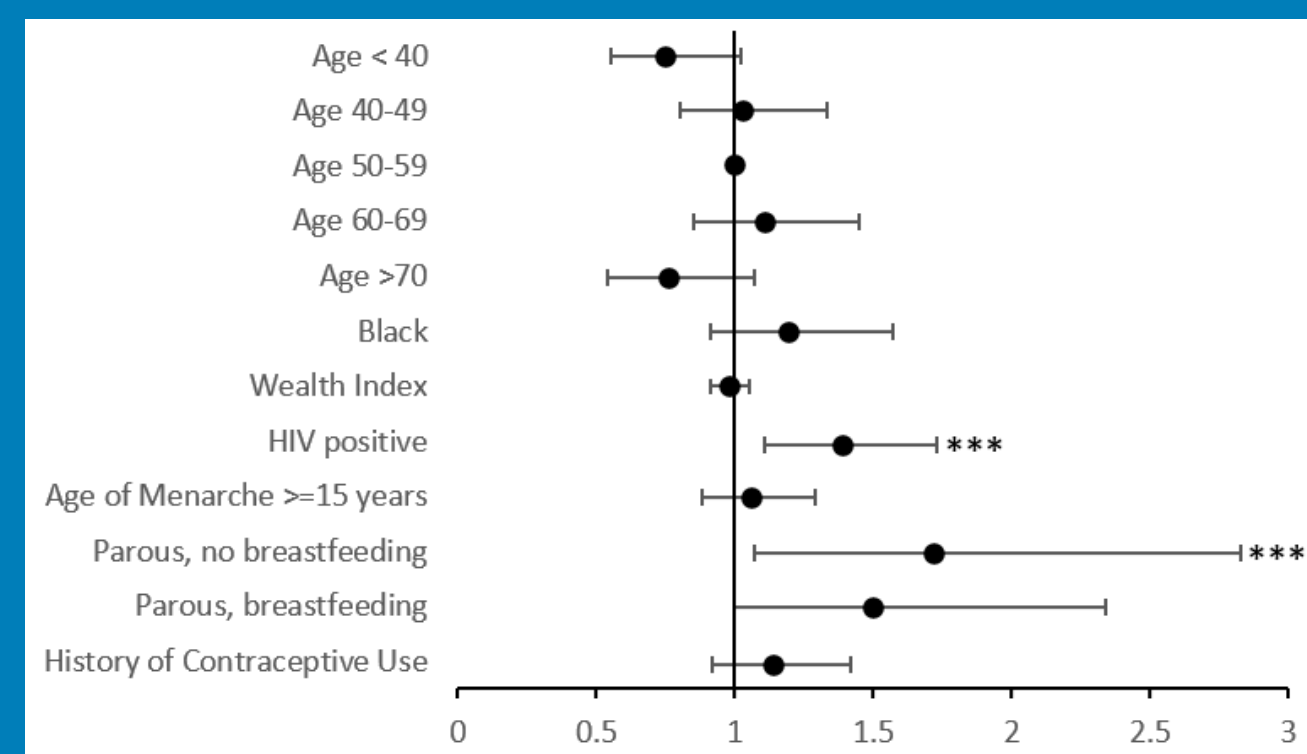Fig. 3: Exclusion criteria for TNBC analysis cohort

Fig. 4: Results of multivariate logistic regression to assess effect of HIV on TNBC vs non-TNBC

METHODS

- Exclude patients with unknown HIV and breast cancer subtype status
- Descriptive statistics using contingency tables
- Multivariate logistic regression models to test associations between HIV and TNBC vs. non-TNBC while controlling for relevant demographic, reproductive, and clinical factors
- Repeat multivariate logistic regression with measures of HIV control (HIV viral load, CD4+ T cell count, ART status, ART duration)

- HIV positive status was found to be associated with increased risk of TNBC relative to non-TNBC
- HIV control was not found to be associated with breast cancer subtype

DISCUSSION

- Women living with HIV (WLWH) are at increased risk of developing TNBC, regardless of degree of HIV control
- Breast cancer screening guidelines should be re-evaluated to consider earlier, more frequent, and more thorough screening of WLWH to help detect TNBC in its earliest stages

REFERENCES

1. Summary Statistics of Cancer Diagnosed Histologically in 2016. Cape Town; 2018.
2. Cubasch H, Dickens C, Joffe M, et al. Breast cancer survival in Soweto, Johannesburg, South Africa: A receptor-defined cohort of women diagnosed from 2009 to 11. Cancer Epidemiol. 2018;52:120-127. doi:10.1016/j.canep.2017.12.007
3. Howlader N, Noone A, Krapcho M, et al. SEER Cancer Statistics Review, 1975-2017. Bethesda, MD https://seer.cancer.gov/csr/1975_2017/, based on November 2019 SEER data submission, posted to the SEER web site, April 2020. Accessed January 27, 2022
4. Dickens C, Duarte R, Zietsman A, et al. Racial comparison of receptor-defined breast cancer in Southern African women: Subtype prevalence and age - Incidence analysis of nationwide cancer registry data. Cancer Epidemiol Biomarkers Prev. 2014;23(11):2311-2321. doi:10.1158/1055-9965.EPI-14-0603
5. Damaskos, Garmpis, et al. (2021). Investigational Drug Treatments for Triple-Negative Breast Cancer. J. Pers. Med. 11(7), 652

Contact information:
Jacob Dubner (jld2241@cumc.columbia.edu)
Dr. Yoanna Pumpalova (yp2184@cumc.columbia.edu)
Dr. Alfred Neugut (ain1@cumc.Columbia.edu)