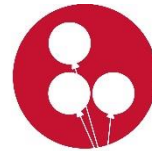


Stony Brook Medicine: Organizational HIV Treatment Cascade

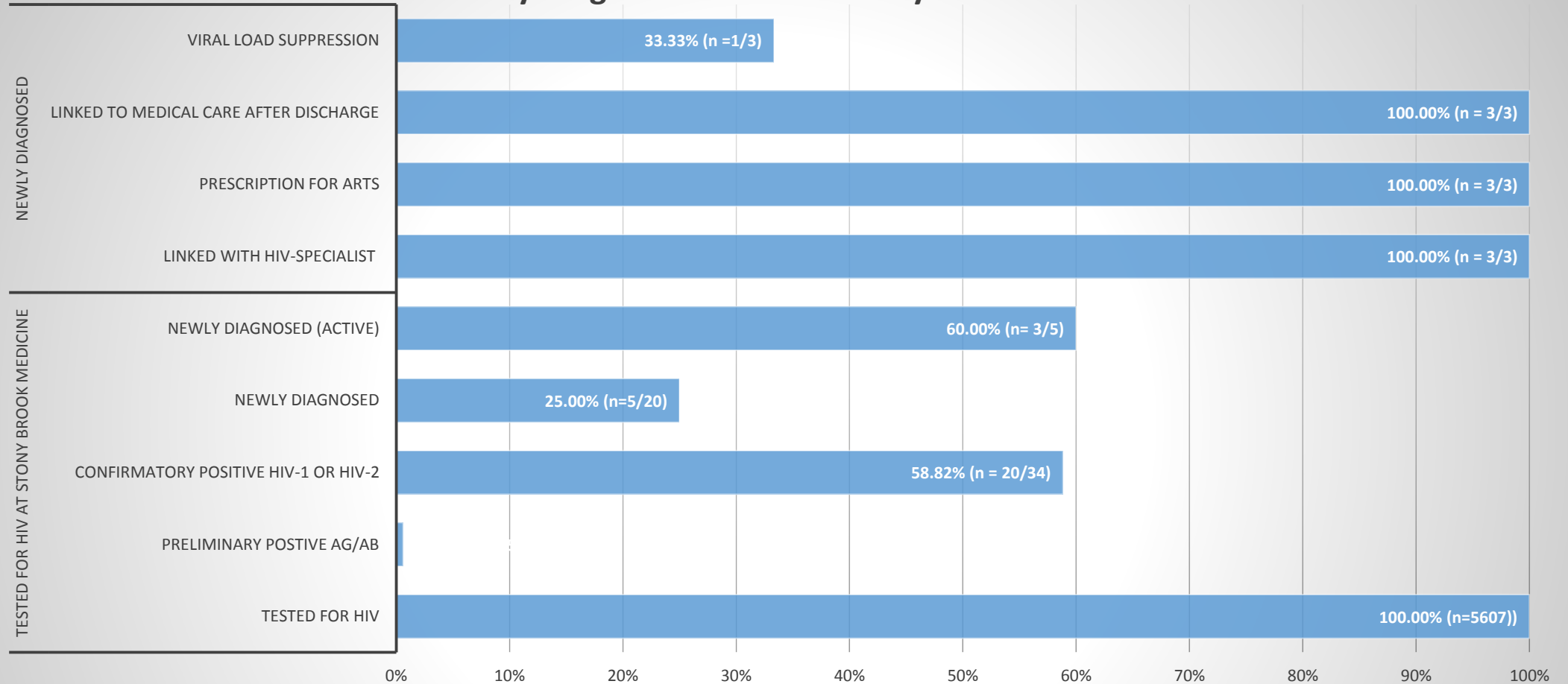


Stony Brook
Medicine



Stony Brook
Children's

2016 Newly Diagnosed Cascade: Stony Brook Medicine



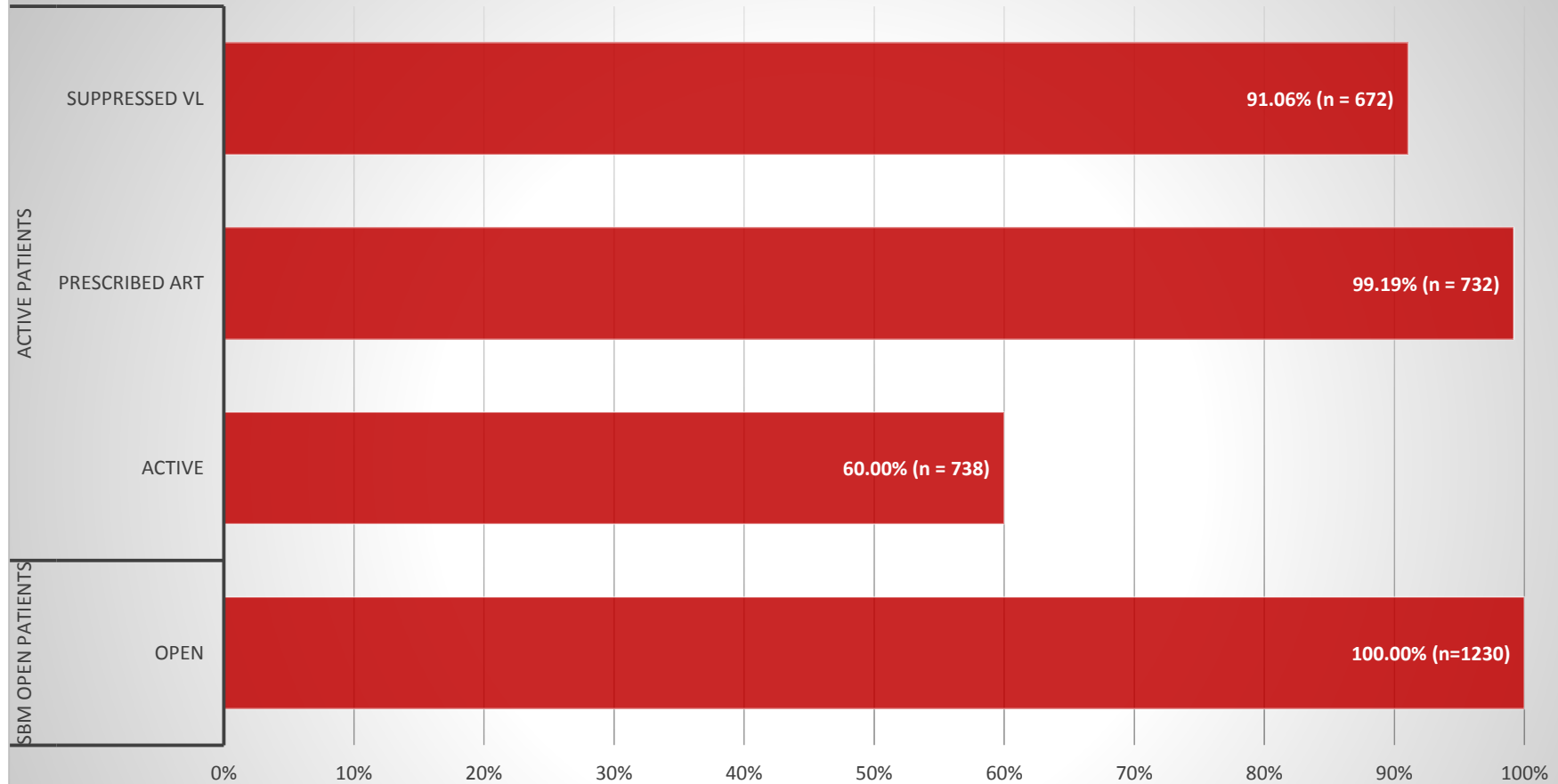
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Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

2016 HIV Care Cascade: Stony Brook Medicine



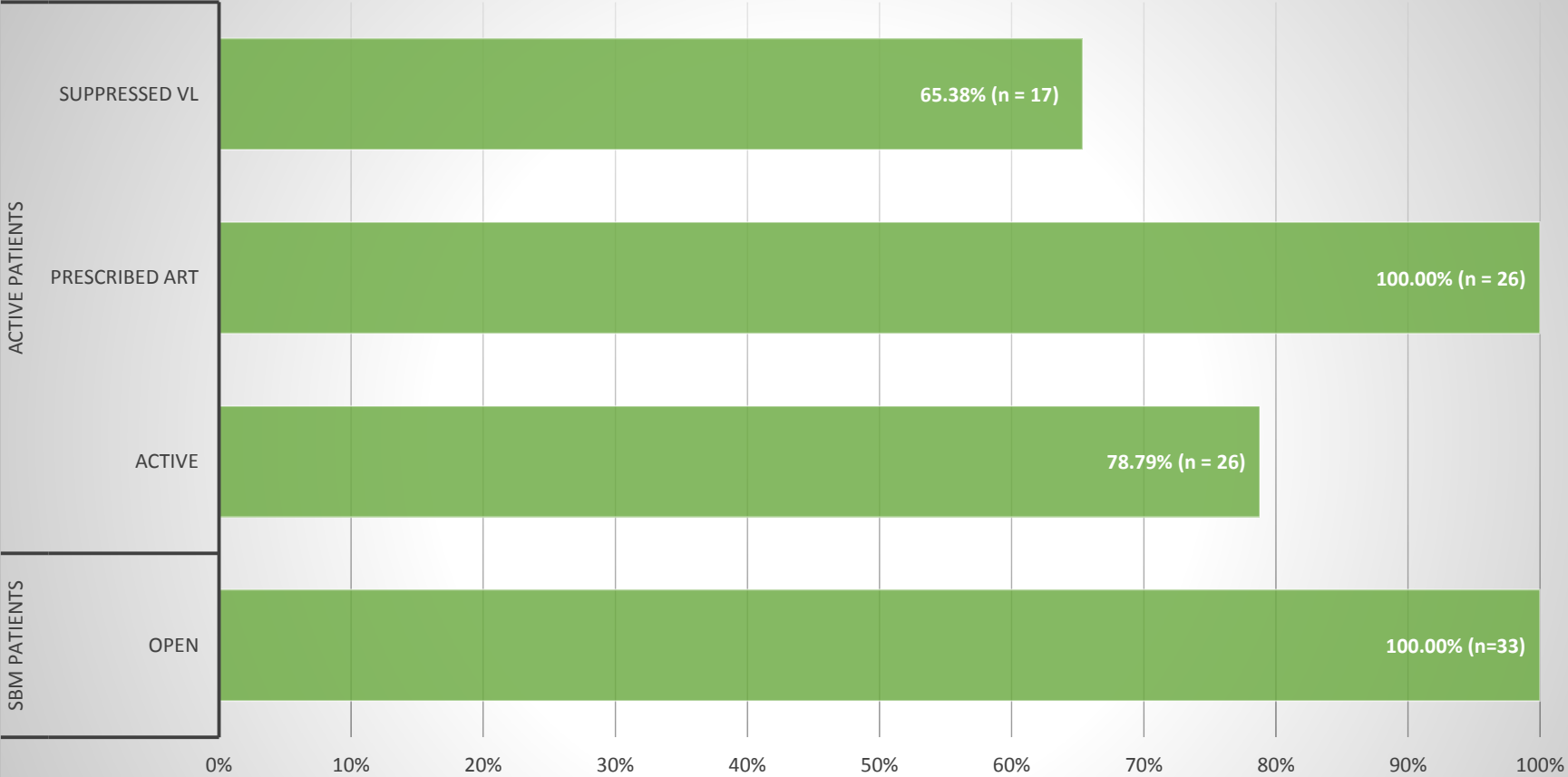
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2016 HIV Care Cascade: Stony Brook Children's Hospital



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2016 HIV Care Cascade: Stony Brook Medicine by Provider



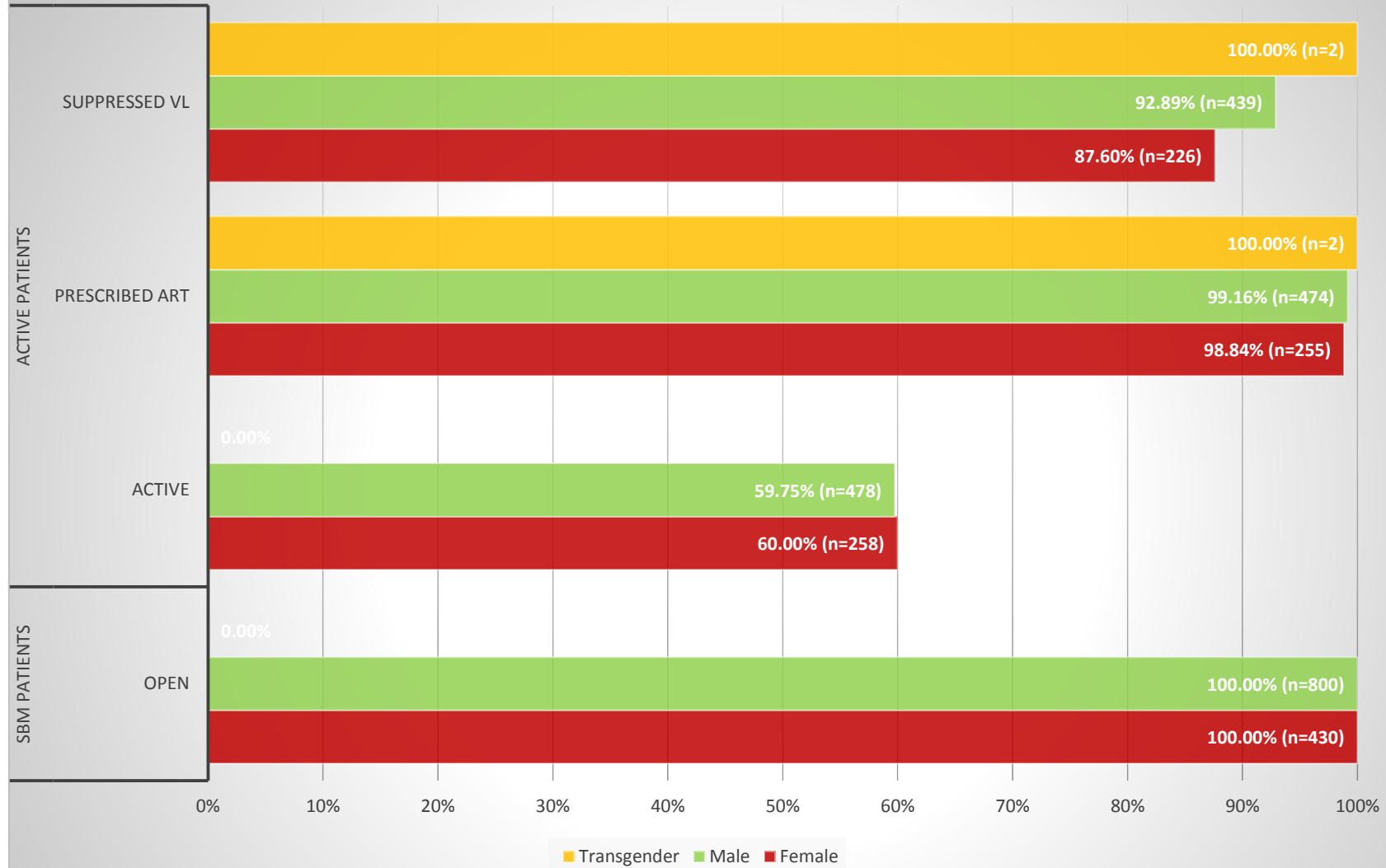
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Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients

Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

2016 HIV Care Cascade: Stony Brook Medicine by Sex



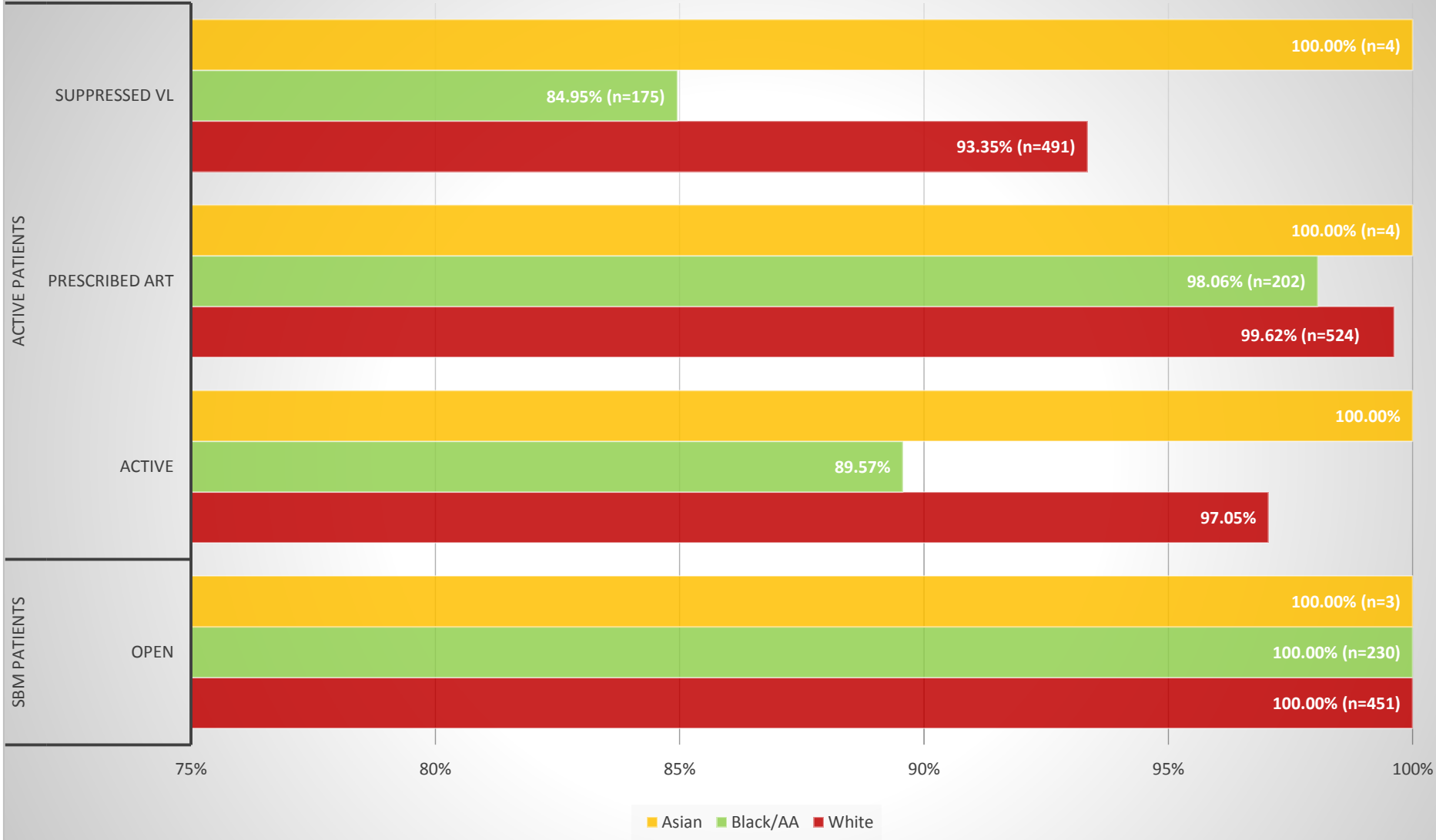
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Active Patients: Patients with a known HIV diagnosis who received services in the HIV Program at SBM during 2016/Open Patients

Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients

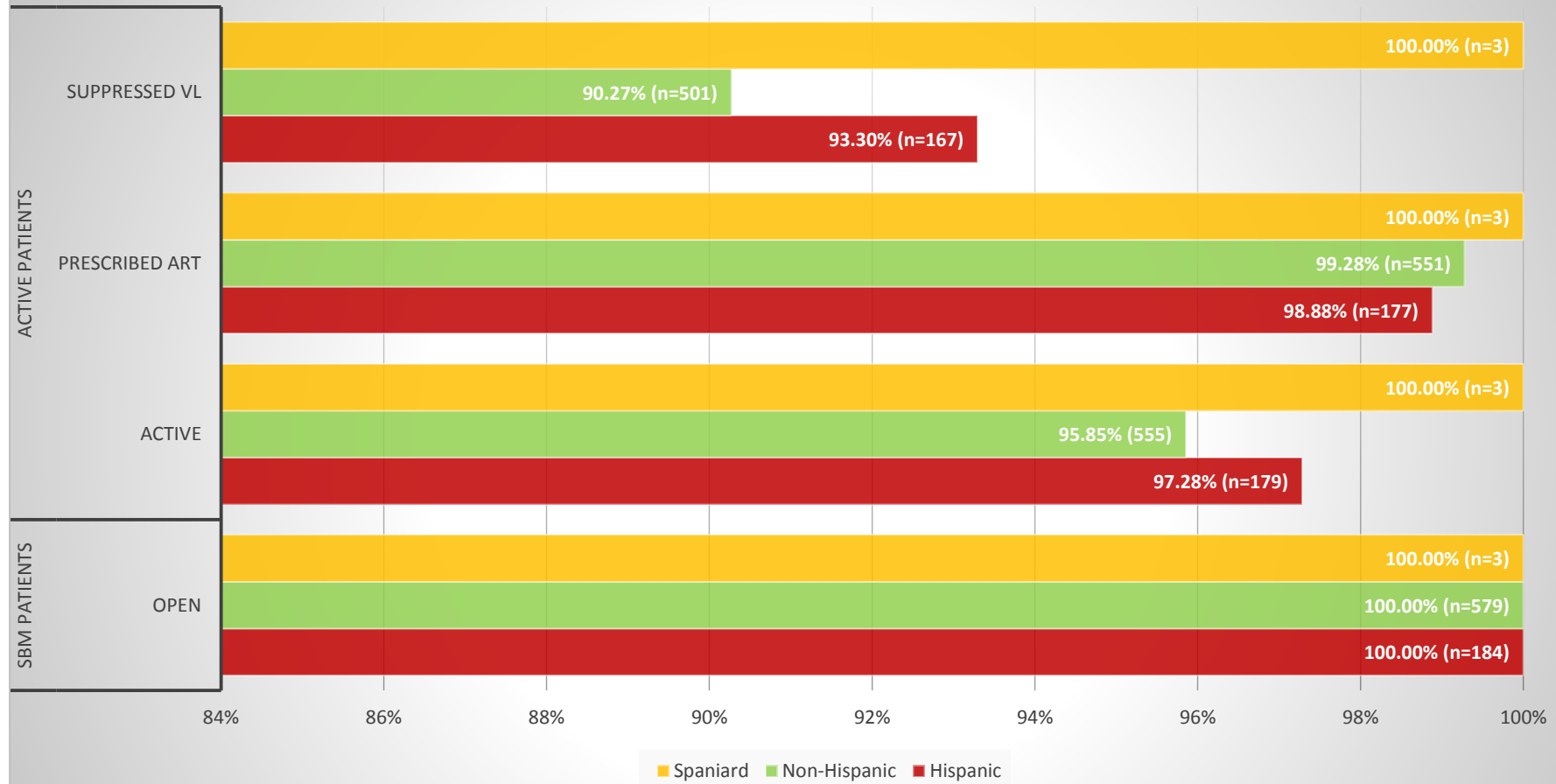
Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

2016 HIV Care Cascade: Stony Brook Medicine - by Race



SBM Open Patients: Patients with a known diagnosis of HIV who received services in the SBM organization during 2016.
Active Patients: Patients with a known HIV diagnosis who received services in the HIV Program at SBM during 2016/Open Patients
Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients
Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

2016 HIV Care Cascade: Stony Brook Medicine - by Ethnicity



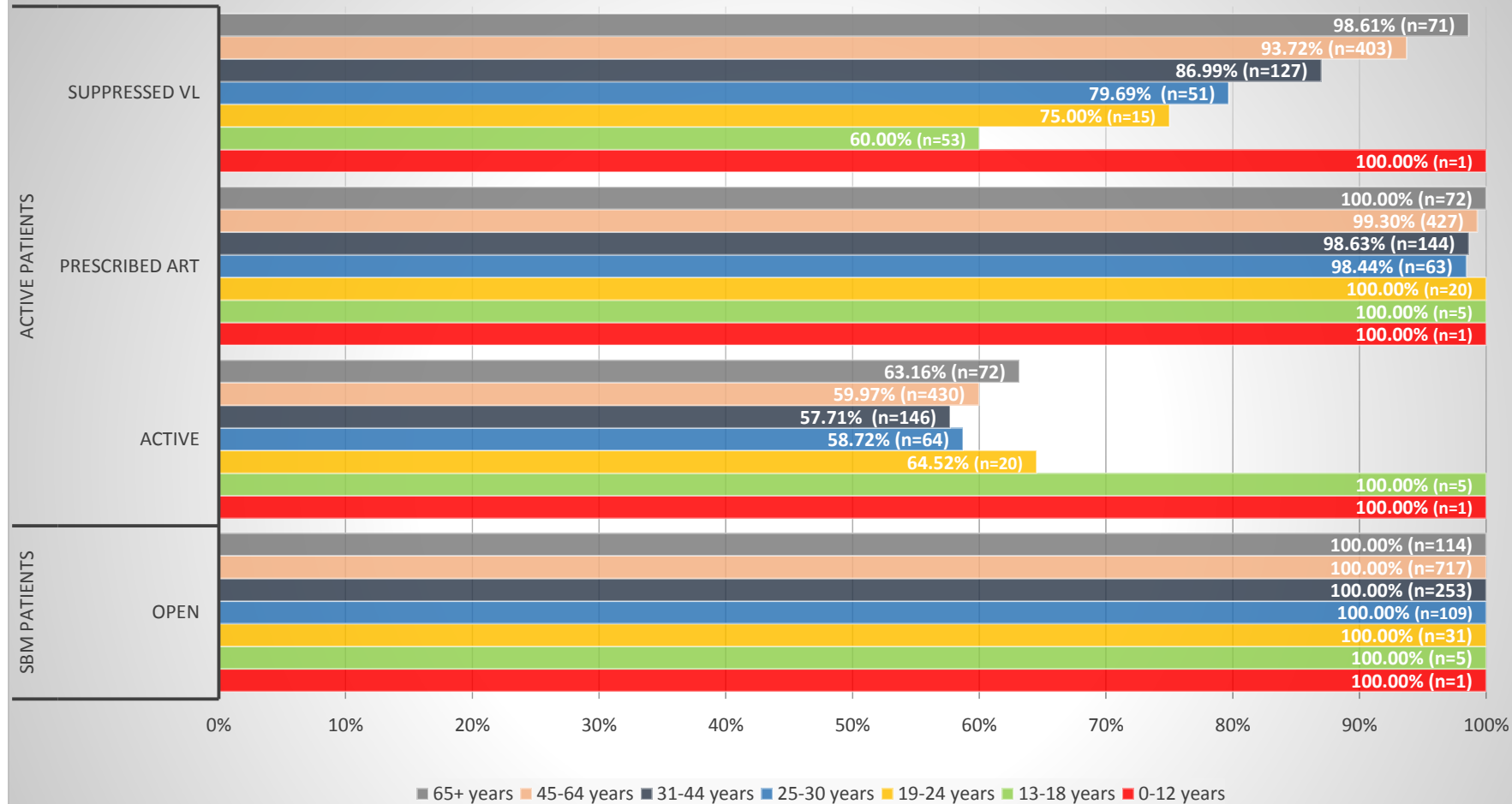
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Active Patients: Patients with a known HIV diagnosis who received services in the HIV Program at SBM during 2016/Open Patients

Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients

Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

2016 HIV Care Cascade: Stony Brook Medicine - by Age



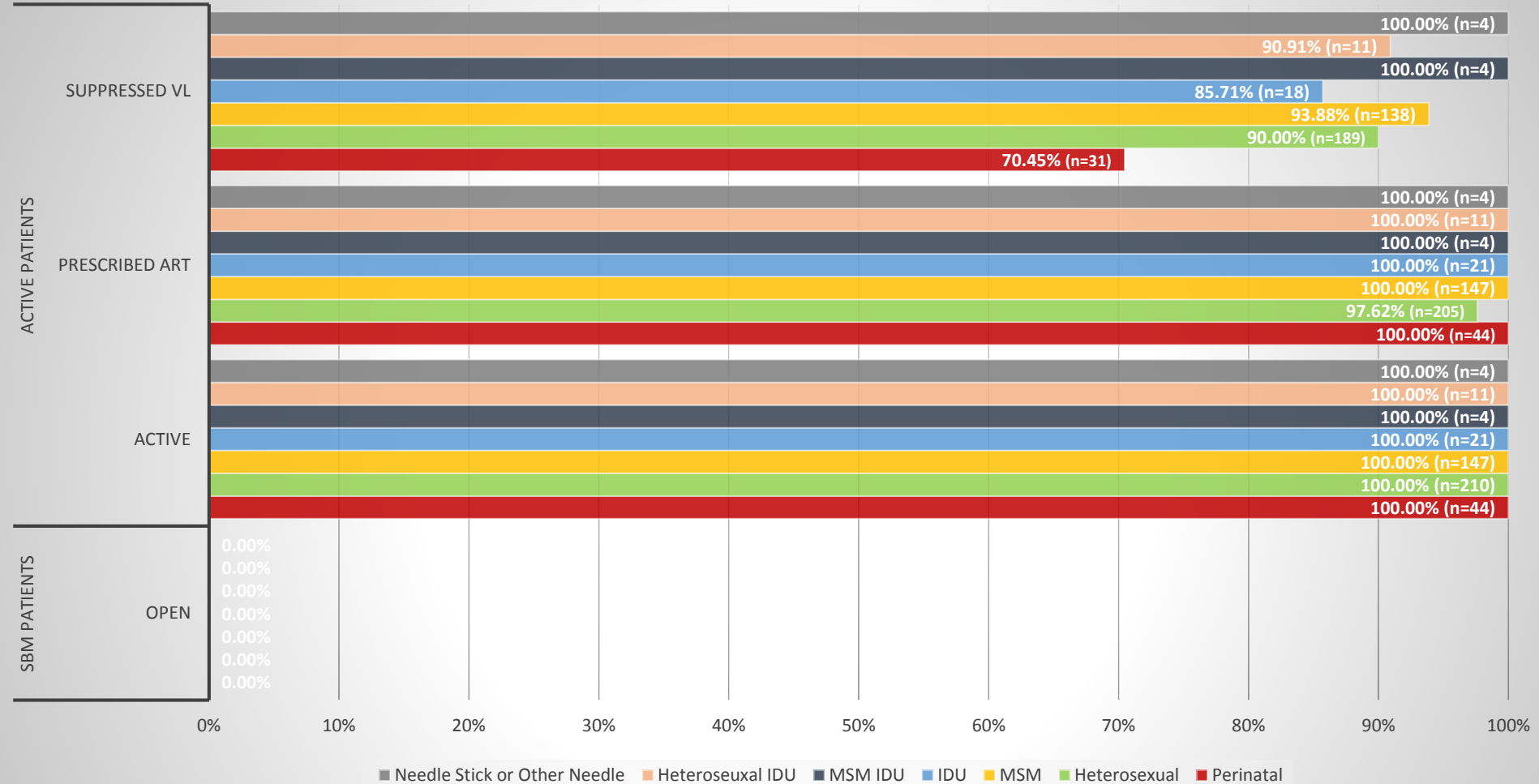
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Active Patients: Patients with a known HIV diagnosis who received services in the HIV Program at SBM during 2016/Open Patients

Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients

Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

2016 HIV Care Cascade: Stony Brook Medicine - by Transmission



SBM Open Patients: Patients with a known diagnosis of HIV who received services in the SBM organization during 2016.

Active Patients: Patients with a known HIV diagnosis who received services in the HIV Program at SBM during 2016/Open Patients

Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients

Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

Stony Brook Medicine 2016 Organizational HIV Treatment Cascade

Stony Brook Medicine (SBM) is a large health system in Suffolk County, New York consisting of Stony Brook University Hospital, Stony Brook Children's Hospital, more than 90 community-based healthcare settings as well as affiliations with Southampton Hospital and Eastern Long Island Hospital. In addition to being a state-Designated AIDS Center (DAC), SBM serves as the region's only tertiary care center and Regional Trauma Center, and is home to the Stony Brook University Heart Institute, Stony Brook University Cancer Center, Stony Brook Children's Hospital (SBCH) and Stony Brook University Neurosciences Institute. SBUH also encompasses Suffolk County's only Level 4 Regional Perinatal Center, state-designated Comprehensive Psychiatric Emergency Program, state-designated Burn Center, the Christopher Pendergast ALS Center of Excellence, Kidney Transplant Center, Pediatric Multiple Sclerosis Center, Dental School, and a Department of Surgery which consists of 10 clinical divisions that represent diverse areas of surgical specialization.

SBM 2016 Organizational HIV Treatment Cascade was completed by the SBM DAC HIV Quality Manager, Cristina Witzke and reviewed by the Designated AIDS Center (DAC) Quality Management Program Committee (QMPC).

A. Cascades:

1. Newly Diagnosed Patients – see attached

The definitions for the Newly Diagnosed Patient Cascade are as follows:

- a. Patients Tested For HIV: Patients seen at SBM (in-patient, emergency room, outpatient) who received an HIV Test.
- b. Preliminary Positive Ag/Ab: Patients with a reactive HIV Ag/Ab test / Patients tested for HIV
- c. Confirmatory Positive for HIV-1 or HIV-2: Patients with a reactive result for HIV-1 or HIV-2/ Patients with a reactive HIV Ag/Ab test
- d. Newly Diagnosed: Patients newly diagnosed with a HIV / Patients with a reactive result for HIV-1 or HIV-2
- e. Newly Diagnosed Active: Patients newly diagnosed (not deceased after test results)/ Patients newly diagnosed with a HIV
- f. Newly Diagnosed- Linked with HIV-specialist: Patients Newly Diagnosed Active, within 3 days and under the care of an HIV-specialist / Patients Newly Diagnosed Active
- g. Newly Diagnosed- Prescription for ARTs: Patients Newly Diagnosed Active and prescribed ARTs / Patients Newly Diagnosed Active
- h. Newly Diagnosed Viral Load Suppression: Patients Newly Diagnosed Active with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016/ Patients Newly Diagnosed Active

2. Established Patients (see attached)

The definitions for the Established Patient Cascade are below. Each definition was also drilled down by SBM by Sex, Race, Ethnicity, Age and Transmission Risk.

- a. SBM Open Patients: Patients regardless of age with a known diagnosis of HIV who received services in the SBM organization during 2016.
- b. Active Patients: Patients regardless of age with a known HIV diagnosis who received services in the HIV Program at SBM during 2016/Open Patients.
- c. Prescribed ART: Patients prescribed ART during the measurement year/ Active Patients
- d. Viral Load Suppression: Patients with a HIV Viral Load less than 200 copies/mL at last HIV viral load test during 2016 / Active Patients

B. Methodology:

1. Newly Diagnosed Patients

a. Data Source:

Our program requested a data report of “Patients Tested for HIV within the SBM health system in 2016” from the SBM Information Technology Department. The data report provided in excel contained the following data: patient name, patient medical record number (MRN), patient age, patient gender, patient race, patient ethnicity, patient encounter type (in-patient, out-patient, emergency room), HIV test date, HIV test name, differentiation results for HIV-1, and differentiation results for HIV-2. The data is obtained from the SBM electronic medical record (EMR). The data in regards to HIV testing is limited as not all outside laboratories are electronically entered the EMR system, rather some laboratory reports are scanned into the system. The scanned data is not counted in the data report. In addition, this report does not capture Stony Brook Dental Clinic, recently acquired community clinics or affiliated hospitals as they are on a different EMR.

b. Data extraction and analysis:

Our program extracted and analyzed this data using excel. The number of patients tested for HIV within the SBM health system in 2016 was 5607; 62.7% (n=3515) in outpatient, 21.2% (n=1191) in-patient, and 16.1% (n=901) in the emergency room. Of those tested for HIV, 0.61% (n=34) patients had a reactive HIV Ag/Ab test; 38.2% (n=13) in outpatient, 50.0% (n=17) in-patient, and 11.8% (n=4) in the emergency room. Of those with a reactive HIV Ag/Ab test, 58.8% (n=20) patients had a reactive result for HIV-1 or HIV-2; 35.0% (n=7) in outpatient, 60.0% (n=12) in-patient, and 5.0% (n=1) in the emergency room. Of those with a reactive result for HIV-1 or HIV-2, 25.0% (n=5) patients were newly diagnosed, the other 75.0% (n=15) were previously diagnosed/known patients. Of those that were newly diagnosed, all were diagnosed while in-patient at Stony Brook University Hospital (SBUH). However, only 3 patients are considered newly diagnosed “active” as two patients died while in-patient before they could be linked to HIV care. All 3 newly diagnosed patients were linked with an HIV-specialist while in-patient, 100.0% (n= 3) were prescribed ARTs and 33.3% (n=1) was virally suppressed. All patients attended HIV medical appointments after discharge from SBUH, 1 internally and 2 externally. In regards to viral load suppression we were unable to obtain viral load result for the 2 patients who were externally linked after discharge from SBUH. The demographics of the newly diagnosed patients were as follows:

- i. Sex: 100% were male
- ii. Age:
 - 66.7% (n=2) were between 31 -44 years

- 33.3% (n=1) was between 45-64 years
- iii. Race
 - 66.7% (n=2) were white
 - 33.3% (n=1) was other
- iv. Ethnicity: 100% (n=3) were Hispanic

2. Established Patient Cascade –

a. Data Source:

- i. *Open Caseload:* SBM uses the Population Health System Healthe Intent for analyzing patient data.

In 2016, our program started working with SBM’s Information Technology Department-Division of Analytics and Population Health to create a database for the DAC to use to create reports containing medical information on all patients with a known diagnosis of HIV (using ICD10 codes) who received services at SBM at any time. Although, SBUH hospital and outpatient clinics use a different EMR system than Southampton Hospital and community practices, the Healthe Intent program can extract data from the different EMR systems. However, some information is incomplete and our staff is unable to verify and/or obtain information as they do not have access to these different EMR systems. Data does not include the Stony Brook Medicine Dental Clinic, Long Island State Veterans Home, or Southampton Hospital’s David E. Rogers HIV Center as their data is not yet integrated into the Stony Brook Population Health System. The database includes the following patient data: demographics, medical visits (HIV specific, by provider), viral load dates and results, ART specific medications, and STI test dates and results.

“Open Caseloads” were not able to be determined for some subcategory cascades due to data limitations. Some Patient demographic data including race and ethnicity were incomplete in the EMR system. In addition, data is also incomplete in regards to sex (gender identity as other than male or female) and transmission risk factors as this information is only available in the EMR as text in a provider’s medical note and not able to be extracted through a report.

- ii. *Active Caseload:*

- Stony Brook Medicine: Our program uses an excel spreadsheet to keep track of all patients regardless of age, with a known diagnosis of HIV who received HIV primary care at SBM. Provider schedules, the EMR, and program staff verification are used to compile data which is entered the excel spreadsheet. The excel spreadsheet contains demographic information, patient status during 2016 (newly diagnosed, continuing patient, transferred in, transferred out, pregnant, incarcerated, in-patient rehabilitation, lost to follow-up, deceased), HIV primary care visits, and HIV Viral Load dates and results. Patient status in 2016 is determined through documentation in the EMR by medical providers, case managers, and/or administrative staff.

- Stony Brook Children's Hospital: A subset of SBM Patients who received services specifically through Stony Brook Children's Hospital's HIV Program.

b. Data extraction and analysis:

Open Caseload: Our program extracted this data using Healthe Intent and downloaded it into a CSV file. Data was analyzed first by "hand." Staff reviewed data removing patients not seen in 2016- sorting by last visit date and removing those that were not seen in 2016. Also removed were HIV exposed children as well as HIV negative patients. While reviewing data, staff noticed that some of those on the list were not diagnosed with HIV and may have had a previous false positive test and/or the incorrect ICD10 code was used (i.e., HIV/AIDS diagnosis was coded when an HIV test was run). There were about 200 patients whom our staff were unable to confirm as HIV positive as they would have had to manually review the patient's charts to confirm diagnosis therefore the actual "open" caseload may be slightly lower than reported in the cascades.

Active Caseload: Our program extracted and analyzed this data using Epi Info from the CDC (<https://www.cdc.gov/epiinfo/index.html>).

i. **Stony Brook Medicine:**

SBM's "Open Case Load" was 1230. Of those at least 60.00% were receiving HIV primary care at SBM, 3.17% were seen at SBUH for ambulatory services (laboratories, imaging, ambulatory surgery), 3.01% in the SBUH Emergency Room, 1.79% SBUH in-patient, 8.13% for primary care, 2.76% for gynecological care, 7.72% for specialty care (cardiology, endocrinology, dermatology, gastroenterology, hematology, nephrology, neurology, oncology, ophthalmology, orthopedic, pain management, psychiatric, sleep medicine, urology, etc.), 2.76% for surgical consults (general, colorectal, bariatric, otolaryngology, plastics, trauma, and/or vascular) and 10.65% at Southampton Hospital (inpatient, laboratories, and/or emergency).

SBM's "Active Caseload" was 60.0% (n=738). Those who were excluded included those patients who were deceased, incarcerated, engaged in care outside SBM (transferred and/or moved), and those with an unknown disposition (lost to follow-up for more than 2 years) during 2016. Of those who are active, 99.19% (n=732) were prescribed ART and 91.06% (n=672) had a suppressed viral load. In regards to those not prescribed ART, 5 patients were not on ART because they are "elite controllers" and 1 patient had ARTs on hold for genotype and phenotype results.

In regards to those without a suppressed viral load, 1.63% (n=12) did not have a viral load test in 2016. If those patients without a viral load test in 2016 were removed from the denominator SBM's viral load suppression rate would increase to 92.56%.

The Cascade Guidance instructs programs to calculate the Active Patients from the Open patients. Our program calculated the Active patients from the Open patients, but would like to point out that a more useful measure would be a

denominator of: number of patients with a known diagnosis of HIV who were patients in the HIV program at the end of 2015 and numerator: those with a known diagnosis of HIV who received services in the HIV program of the organization during the measurement year. This would allow us to calculate “retention” when it comes to our program, rather than just the number of patients who may access our Emergency Departments, Hospitals, and/or outpatient care centers. Using this calculation in place of the “open” 95.97% would be Active (n=738/769). Of those who were not active (n=30):

Status	n
Transfer Out	16
Incarcerated	3
Inpatient Rehab	1
Lost to Follow-up	2
New & Transferred to external organization	2
Transferred in & then to external organization	1
Deceased	5
Total	30

ii. **Stony Brook Children’s Hospital**

Stony Brook Children’s Hospital’s “Active Case Load” was 78.79% (n=26). Those who were excluded included those patients who were engaged in care outside SBM (transferred and/or moved) during 2016. Of those who are active, 100% (n=26) were prescribed ART and 65.38% (n=17) had a suppressed viral load. In regards to those without a suppressed viral load, 3.85% (n =1) did not have a viral load test in 2016. If those patients without a viral load test in 2016 were removed from the denominator SBCH’s viral load suppression rate would increase to 68.00%.

iii. **Stony Brook Medicine by Sex**

Limitations of the electronic medical record system as mentioned above does not include transgender as a choice. See tables below for results by sex. If those patients without a viral load test in 2016 were removed from the denominator viral load suppression rate would increase to 88.97% for females and to 94.89% for males.

SEX	Open	Active		ARTs		Suppressed	
	Freq	Freq	%	Freq	%	Freq	%
Male	800	478	59.75%	474	99.16%	444	92.89%
Female	430	258	60.0%	255	98.8%	226	87.60%
Transgender	0	2	n/a	2	100.0%	2	100.0%

iv. **Stony Brook Medicine by Race**

The limitations in data extracted from the EMR data mentioned above can be seen when analyzing race. The “Open Case Load” numbers do not accurately

reflect the population served. As for our “Active Case Loads” our staff is accurately able to obtain this information first hand from the patient and enters this information in medical notes. See tables below for results by race. If those patients without a viral load test in 2016 were removed from the denominator viral load suppression rate would increase to 94.61% for Whites and 87.06% for Black and/or African Americans.

	Open		Active		ARTs		Suppressed	
RACE	Freq	Freq	%	Freq	%	Freq	%	
White	451	526	n/a	524	99.62%	491	93.35%	
Black/African American	230	206	n/a	202	98.06%	175	84.95%	
Asian	3	4	n/a	4	100.0%	4	100.0%	

v. **Stony Brook Medicine by Ethnicity**

The limitations in data extracted from the electronic medical record data mentioned above can be seen when analyzing ethnicity. The “Open Case Load” numbers do not accurately reflect the population served. See tables below for results by Ethnicity. If those patients without a viral load test in 2016 were removed from the denominator viral load suppression rate would increase to 92.27% for Non-Hispanics.

	Open		Active		ARTs		Suppressed	
ETHNICITY	Freq	Freq	%	Freq	%	Freq	%	
Hispanic	66	179	n/a	177	98.88%	167	93.30%	
Non-Hispanic	372	555	n/a	551	99.28%	501	90.27%	
Spaniard	0	3	n/a	3	100.0%	3	100.00%	

vi. **Stony Brook Medicine by Age**

See tables below for results by Age. If those patients without a viral load test in 2016 were removed from the denominator viral load suppression rate would increase to 78.95% for those between 19 and 24 years old, 80.95% for those between 25 and 30 years old, 88.81% for those between 31 and 44 years old, 95.05% for those between 45 and 65 years old, and 100% for those over 65 years old.

	Open		Active		ARTs		Suppressed	
Age	Freq	Freq	%	Freq	%	Freq	%	
0-12 years old	1	1	100.0%	1	100.0%	1	100.00%	
13-18 years old	5	5	100.0%	5	100.0%	3	60.00%	
19-24 years old	31	20	64.52%	20	100.0%	15	75.00%	
25-30 years old	109	64	58.72%	63	98.44%	51	79.69%	
31-44 years old	253	146	57.71%	144	98.63%	127	86.99%	
45-64 years old	717	430	59.97%	427	99.30%	403	93.72%	
65+ years old	114	72	63.16%	72	100%	71	98.61%	

vii. **Stony Brook Medicine by Transmission**

Limitations of the electronic medical record system in regards to HIV transmission risk as mentioned above, includes transmission only in provider notes which cannot be extracted in a data report. See tables below for results by transmission risk.

Transmission	Open	Active		ARTs		Suppressed	
	Freq	Freq	%	Freq	%	Freq	%
Perinatal	n/a	44	n/a	44	100.0%	31	70.45%
Heterosexual	n/a	210	n/a	205	97.62%	189	90.00%
MSM	n/a	147	n/a	147	100.0%	138	93.88%
IDU	n/a	21	n/a	21	100.0%	18	85.71%
MSM/IDU	n/a	4	n/a	4	100.0%	4	100.00%
Heterosexual/IDU	n/a	11	n/a	11	100.0%	10	90.91%
Needle Stick or Other Needle	n/a	4	n/a	4	100.0%	4	100.00%
Blood Transfusion	n/a	1	n/a	1	100.0%	1	100.00%