

## ABSTRACT

### Background

In 2019, 36,801 new HIV cases were reported in the United States. Emergency Department routine HIV testing is crucial to identifying undiagnosed asymptomatic HIV infections.

Early diagnosis followed by prompt antiretroviral therapy decreases morbidity and mortality and reduces HIV transmission. The Emergency Department (ED) at Memorial Hermann Hospital (MHH) - Texas Medical Center (TMC) in Houston, Texas, implemented an ED-routine HIV screening program in June 2017.

At times, the testing for HIV yields indeterminate results. Consequences of indeterminate HIV tests include individuals unaware of their HIV infection status transmitting infection and not receiving antiretroviral therapy.

### Methods

39,288 adults who presented to ED MHH –TMC from June 2017 to March 2022 with a Glasgow score > 9 were tested using an Opt-Out protocol for HIV infection.

Testing comprised a screening assay (HIV 4th Generation (GEN) ADVIA Centaur Ag/Ab COMBO (Siemens) followed by a confirmatory test (Geenius HIV1/HIV2).

A second confirmatory test (HIV1 RNA PCR or a repeat 4th GEN test) is performed if screening and first confirmatory tests yield conflicting (indeterminant) results.

### Results

824 (2.0 %) patients tested positive for HIV infection; 94 (0.2%) yielded indeterminate test results. 61 (64.8%) of the patients with indeterminate findings received confirmatory testing; 37 (39.4%) before leaving the hospital (35 HIV negative, 2 positive).

Of the 57 (60.1%) who left the hospital before confirmatory testing, 24(42.1%) were traced and tested (21 HIV negative, 3 positive).

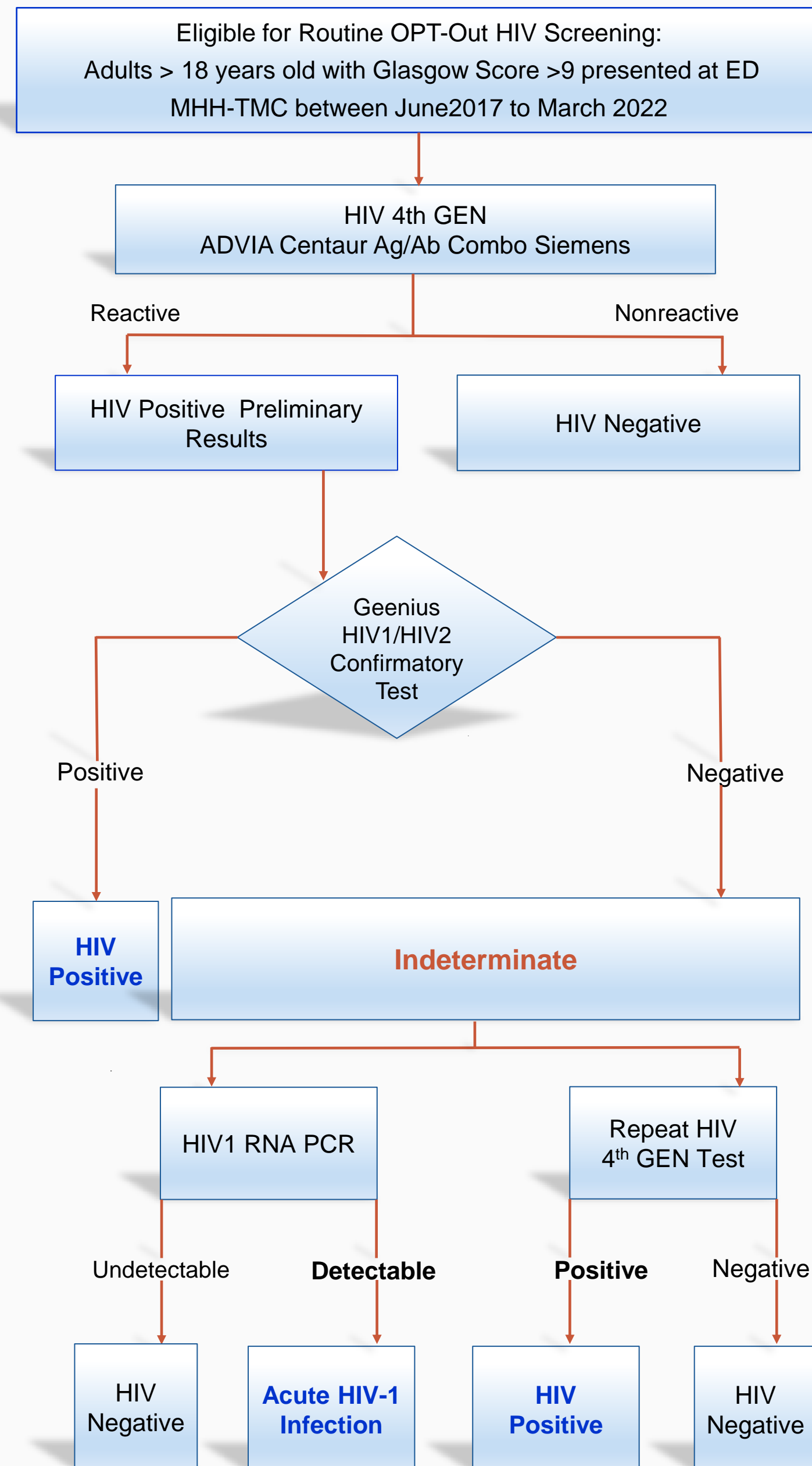
33 (35.1%) were lost to follow-up (11 of whom were reported homeless or in unstable housing).

### Conclusion

The primary cause of failure of follow up testing on patients who tested indeterminate during an ED visit is a loss of contact with the patients after leaving the ED.

In turn, failure to link these patients to HIV care relates to a failure to complete confirmatory testing before completion of the hospital visit. Therefore, the quantitative results presented will enable the assessment of the best deployment of resources in capturing those patients currently lost to follow-up.

## METHODS



## RESULTS

Table 1. Characteristics of Patients with HIV Indeterminate Results

Characteristic	Patients (n=94) n (%)
<b>Age-yr</b>	
Median range	42 (18-74)
<b>Gender</b>	
Male	48 (51)
Female	46 (48.9)
<b>Race / Ethnicity</b>	
African American	33 (35.1)
White	29 (30.9)
Hispanic	24 (25.5)
Other	6 (6.4)
Asian	2 (2.1)
<b>Underlying Conditions</b>	
None	26 (27.7)
Disorders involving the immune system	10 (10.6)
Neoplasms	9 (9.6)
Endocrine, nutritional and metabolic	9 (9.6)
Diseases of the circulatory system	8 (8.5)
Diseases of the digestive system	8 (8.5)
Pregnancy	7 (7.4)
Substance abuse	5 (5.3)
Diseases of the nervous system	4 (4.3)
Mental health disorders	3 (3.2)
Diseases of respiratory system	3 (3.2)
Diseases of the kidney system	1 (1.1)
Gender affirming hormone therapy	1 (1.1)

Table 2. Patients without underlying conditions with HIV Indeterminate results

Emergency Department Visit Diagnosis	Patients (n=26) n (%)
<b>Infectious Diseases</b>	11 (42.3)
Abscess	3 (27.3)
Infectious Mononucleosis	2 (18.2) *
Pneumonia	2 (18.2)
Acute anterior uveitis	1 (9.1)
Viral petechial rash	1 (9.1)
Urinary Tract Infection	1 (9.1)
Gastroenteritis	1 (9.1)
Injuries	11 (42.3)
Acute diseases of the nervous system	3 (11.5)
Acute diseases of respiratory system	1 (3.8)

\* Acute HIV

Fig 1. Confirmatory Testing for indeterminate HIV results

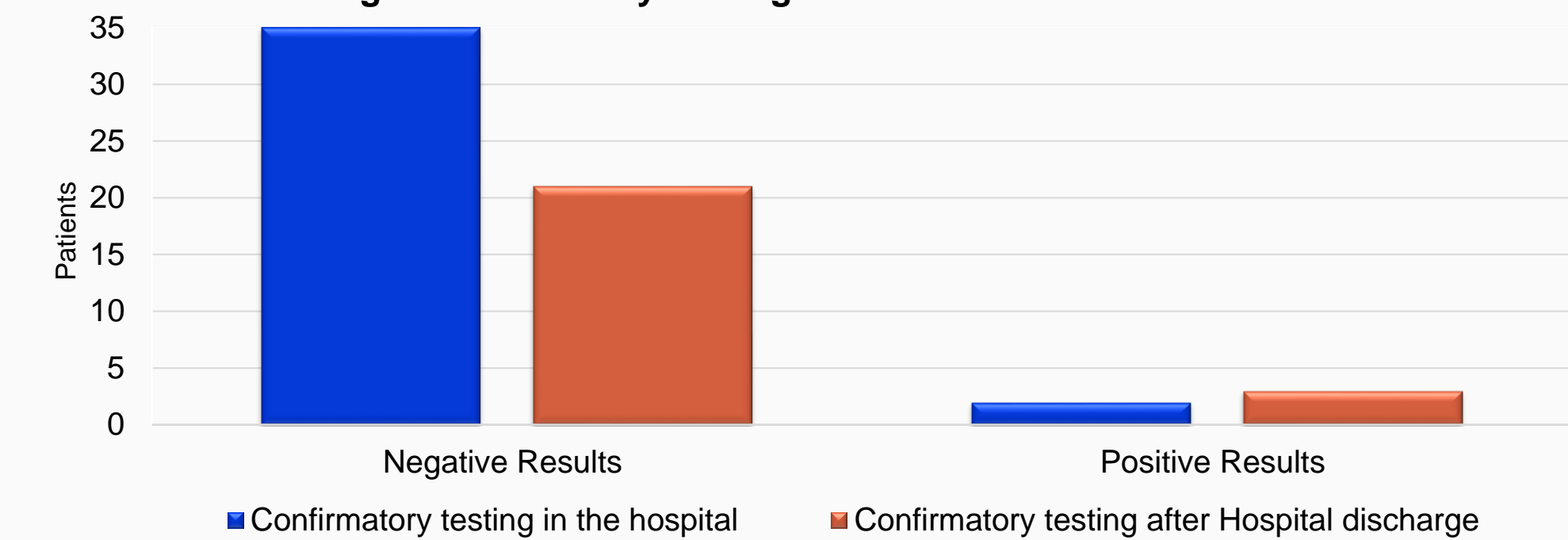


Table 3. Confirmatory Testing following indeterminate HIV results

Variable	Completed Confirmatory testing* n (%)	Confirmatory testing in the Hospital n (%)	Confirmatory testing after Hospital discharge n (%)
<b>Total Confirmatory Results</b>	<b>61/94 (64.8)</b>	<b>37 (39.4)</b>	<b>24 (25.5)</b>
<b>Negative Results</b>	<b>56 (91.8)</b>	35 (94.5)	21 (87.5)
HIV1 RNA PCR Undetectable	42 (75)	31 (88.5)	11 (52.3)
Second 4 <sup>th</sup> Gen HIV Negative	14 (25)	4 (11.4)	10 (47.6)
<b>Positive Results</b>	<b>5 (8.1)</b>	2 (5.4)	3 (12.5)
HIV1 RNA PCR Detectable	4 (80)	2 (100)	2 (66.6)
Second 4 <sup>th</sup> Gen HIV Positive	1 (20)		1 (33.3)

\*33 (35.1%) pts. were lost to follow-up (11 of whom were reported homeless or in unstable housing).

## CONCLUSION

- The early ordering of an HIV1 RNA PCR or a second 4th GEN HIV should not be delayed after an indeterminate HIV result.
- The primary cause of failure of follow up testing on patients who tested indeterminate during an ED visit is a loss of contact with the patients after leaving the ED.
- This study highlights the need to use the HIV laboratory diagnostic testing algorithm to identify indeterminate and acute HIV cases.