Third • Coast • CFAR
CENTER FOR AIDS RESEARCH
IN CHICAGO

NM HIV Treatment and Testing Cohorts

Chad Achenbach, MD, MPH
Associate Professor
Departments of Medicine and Preventive Med
Division of Infectious Disease
Division of Cancer Epidemiology
Center for Global Health

Questions and Overview

1. Why do we need NM HTTC?

2. What are the goals of the NM HTTC?

3. What is the NM HTTC?

4. What kind of information is in NM HTTC?

5. How has NM HTTC helped HIV research?

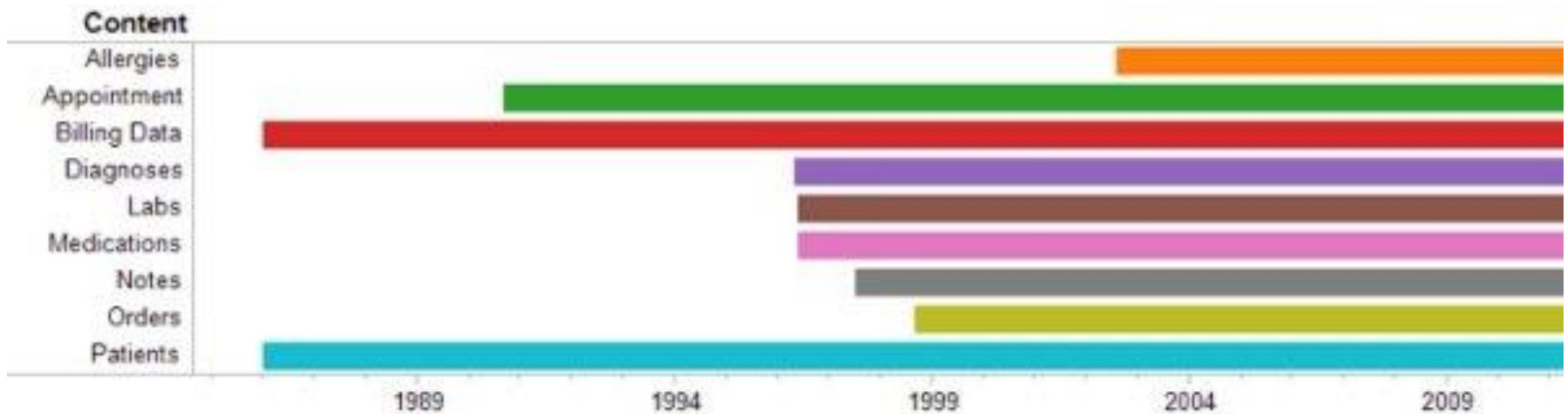6. How can I get involved with NM HTTC?

Why do we need NM HTTC?

- Evolving HIV epidemiology

- HIV related information across NM fragmented

- Observational EMR based HIV research

- Identify individuals for intervention or cohort HIV research

What is NM EDW ?

- Single, comprehensive and integrated repository of all clinical and research data sources
  - Diagnoses, labs and meds since 2000
- >67 billion observations on approx 3 million patients

What are the goals of the NM HTTC?

- Maintain and provide a single comprehensive and integrated electronic data source of all HIV infected individuals

- Assist with clinical trial or cohort study recruitment

- Platform for observational HIV research

- Evaluate quality of HIV care and identify areas of opportunity for research and improvement

What is the NM HIV Treatment Cohort?

- Collection of electronic information from NM electronic data warehouse (NMEDW) on:

-- Adults (>18 years) with HIV- confirmed by specific HIV laboratory testing (positive HIV antibody/antigen or detectable HIV RNA) OR ICD9/10 coding for HIV and documentation of specific ART or HIV RNA testing twice within 24 months (n=7,906);

AND

-- Visited NM clinic at least twice >90 days apart (n=4,585);

AND

-- Receiving ART (n=3,513)

What is the NM HIV Testing Cohort?

- Collection of electronic information from NM electronic data warehouse (NMEDW) on:

-- Adults (>18 years) with any type of HIV specific laboratory testing done throughout the NM system (HIV Ab/Ag, HIV ELISA/WB, HIV RNA, etc.) (n=190,415)

What kind of information is in NM HTTC?

- Demographics

- Laboratory testing

- ICD9/10 coding

- NM clinic/hospital visits and locations

- Providers of care

What kind of information is in NM HTTC?
Clinics/Care Site Visits (n=7,906)

Clinic	N visits
TOTAL	**360,954**
ED	14,555
Inpatient	11,647
Outpatient	113,068
NMH Infectious Diseases	*99,311*
Halsted/SONO Internal Med	*32,407*
Lakeview Internal Med	*13,672*
NMFF Hematology/Oncology	*7,631*
Transplant Clinic	*3,582*

What kind of information is in NM HTTC?
Demographics (n=3,513)

Characteristic	N (%) or Median (IQR)
Current age (years) ≥ 50 ≥ 60	51 (42, 57) 1,845 (53) 606 (17)
Female sex	568 (16)
Black race	1139 (33)
Clinic visits	25 (11, 51)
Initial visit year	2006 (2001, 2011)
Last visit year	2016 (2012, 2017)
Follow-Up time (years)	6.6 (2.6, 13.0)

What kind of information is in NM HTTC? HIV Disease (n=3,513)

Characteristic	N (%) or Median (IQR)
INSTI use	1,085 (31)
Nadir CD4 ≤ 200	266 (122, 406) 1,170 (38)
ART Time	3.3 (1.8, 4.3)
Latest CD4 ≥ 500	503 (295, 730) 1,542 (50)
HIV RNA within past year	943 (27)
Last HIV RNA <50	2,222 (75)
Time HIV RNA <50 (years)	4.5 (1.2, 8.4)

What kind of information is in NM HTTC? Co-Morbidities (n=3,513)

Characteristic	N (%) or Median (IQR)
Co-Morbidities (ICD9 or ICD10)	
AIDS cancer	163 (5)
CVD	406 (12)
Diabetes	*1,119 (32)*
Dyslipidemia	*1,038 (30)*
HTN	*1,148 (33)*
Liver disease	491 (14)
Lung disease	720 (21)
Non-AIDS cancer	337 (10)
Psych/Neuro disorder	*1,403 (40)*
Renal disease	564 (16)

What kind of information is in NM HTTC?
HIV Testing Cohort (n=190,415)

Characteristic	N (%) or Median (IQR)
Age at testing (years)	35 (29, 45)
Female sex	168,787 (52)
Black race	56,685 (18)
Testing site (n=312,141)	
Outpatient	**270,317 (87)**
Inpatient Unit	31,129 (10)
ED/Observation Units	**7,796 (2)**
Other/missing	2,899 (1)

How has NM HTTC and NMEDW helped HIV research?

- Recruitment for HILLCLIMBER – Feinstein

- Recruitment for TANGO and IMAP – Taiwo, ACTG studies

- NM observational research on HIV-associated CVD, heart failure, lymphoma, HSCT and lung cancer

How can I get involved with NM HTTC?

- Email me!

c-achenbach@northwestern.edu

Using Electronic Medical Record Data for HIV Research:
Resources at the University Of Chicago

Jessica Ridgway, MD, MS
Assistant Professor of Medicine
Section of Infection Diseases & Global Health
Director of Predictive Analytics
Chicago Center for HIV Elimination

Overview of University of Chicago Clinical Research Data Warehouse (CRDW)

- Repository of UC medical data dating back to 2000 including Epic electronic medical records, Centricity billing, registries

- Lab values, procedure and diagnosis codes, demographics, medications, visit information

- Much more robust data from 2011 to present (when Epic implemented at UC)

Overview of University of Chicago Clinical Research Data Warehouse (CRDW)

- Includes data for patients treated at University of Chicago Campus including outpatient clinics, ED, inpatient

- Includes data from some off-site outpatient clinics (e.g., 150 E Huron Clinic, South Loop Clinics)

- Does not include other affiliated sites (e.g., Ingalls Hospital) or other HIV Care sites where UC physicians practice (e.g., HBH, Access, Friend Family Center)

Overview of Electronic HIV Cohorts at UC

- Recreated queries from NM HIV Cohorts using UC Electronic Data Warehouse

    – HIV Treatment Cohort
    – HIV Testing Cohort

UC HIV+ Cohort

- Patients ≥ 18 years who meet any ONE of the following criteria:

  - Positive HIV antibody
  - Detectable HIV viral load
  - ICD9/ICD10 code for HIV and at least 2 orders for an HIV viral load within 24 months
  - ICD9/ICD10 coding for HIV and any prescription for antiretroviral medication

- 3,143 patients from March 2000 – April 2018

- 780 patients received primary HIV care at UC from 2011

UC HIV Treatment Cohort Demographics

Characteristic	N (%) or Mean (SD)
Age	47.3 (13.6)
Female sex	278 (40.1)

Race
  African American
  White
	
	579 (84.5)
	91 (13.3)

# of visits	19.5 (17)
Virally suppressed at last visit	551 (78.7)
CD4 at last visit	495 (340)

UC HIV Treatment Cohort Data

- All appointments (both kept and missed) in all departments

- Medications

- All diagnoses, problem lists, past medical history

- Insurance

- Social history

UC HIV Treatment Cohort – Additional Data

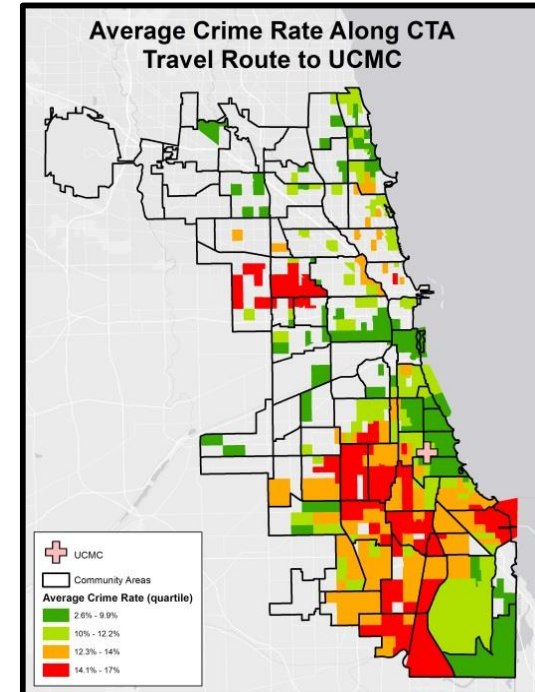- Additional data available for HIV treatment cohort through CFAR pilot award project

THE UNIVERSITY OF CHICAGO MEDICINE & BIOLOGICAL SCIENCES
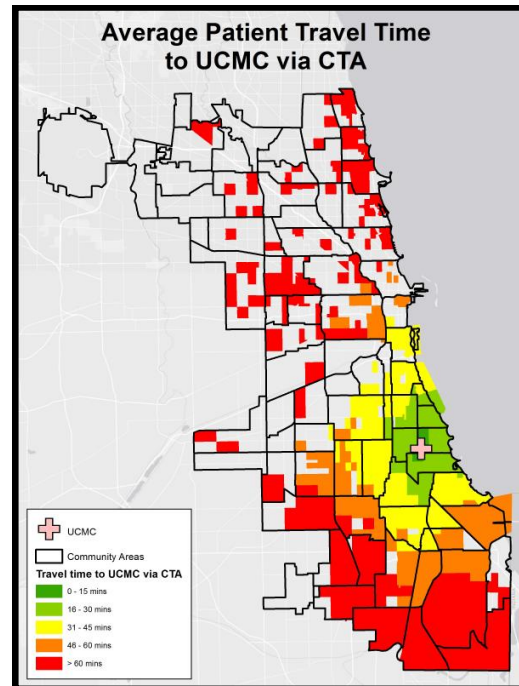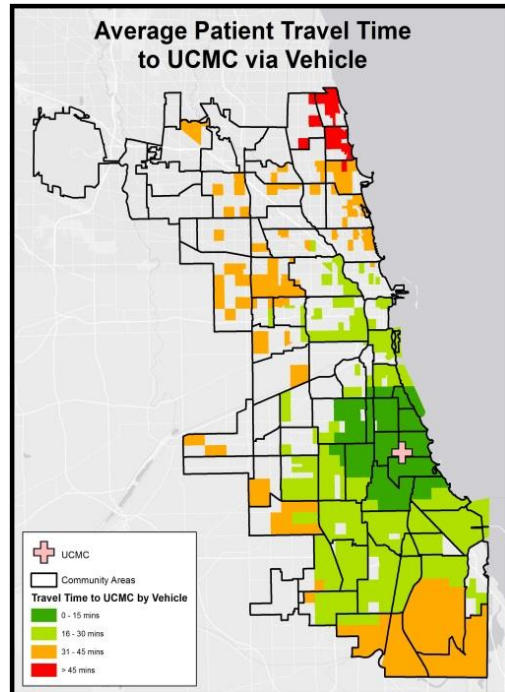
Third Coast CFAR
CENTER FOR AIDS RESEARCH IN CHICAGO

UC HIV Treatment Cohort – Additional Data

- Geocoded patient address and clinic location/pharmacy

Maps of patient density, travel time to clinic, and average crime rate along travel route to clinic

THE UNIVERSITY OF
CHICAGO MEDICINE &
BIOLOGICAL SCIENCES

HIV Treatment Cohort Data – Additional Data

- Unstructured text of all HIV provider notes and social work notes

- Natural language processing of notes to look for key words and phrases related to:

  - psychiatric illness
  - substance use
  - medication adherence
  - social stressors

Examples of Ongoing/Completed Research Projects Using HIV Treatment Cohort Data

- Impact of travel time to clinic on retention in care

- Impact of travel time to pharmacy, mail order vs. retail pharmacy on viral suppression

- Creation of predictive model for retention in care

- Comparison of EMR data available through structured fields vs. unstructured fields for psychiatric illness and substance use

UC HIV Testing Cohort

- Criteria: Any patient ≥18 years tested for HIV Ab/Ag, HIV ELISA/WB, HIV RNA, etc.

- Data available from March 2000-present

UC HIV Testing Cohort

- As of April 2018, 114,811 tests performed

- 1,768 positive tests

- 81,911 unique patients

- Range # tests per person 1-28

UC HIV Testing Cohort

- Gender

  - 63% Female

- Race

  - 63% African American
  - 24% Caucasian
  - 13% other

- Testing location (2017)

  - 32% Outpatient Primary Care
  - 20 % Outpatient OB
  - 23% ED
  - 11% outpatient subspecialty clinic
  - 12% inpatient

UC HIV Testing Cohort

- Other data available

  – Diagnoses

  – Other Laboratory tests (STI tests, etc.)

  – Medical visits

  – Insurance

THE UNIVERSITY OF
CHICAGO MEDICINE &
BIOLOGICAL SCIENCES

Testing cohort

- From 2011 onward, additional information available for those testing HIV+ through XTLC database

    – New vs. existing diagnosis
    – Time to linkage to care
    – HIV risk factor

Examples of Ongoing Projects Using HIV Testing Cohort Data

- Missed opportunities for HIV testing or PrEP

- Comparison of linkage rates/time to linkage in different demographic groups

Comments/Questions