Uncovering HIV Infection in the Emergency Department

A 2011 Public Health Perspective

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Disclosures

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Dr. Haukoos's presentation was reviewed in light of his disclosures. No bias was found, only raw data was presented, and no recommendations were made. No conflict exists.

Overview

The problem

Our approaches and solutions

Impact and outcomes

Current state

Awareness in the United States

Number with HIV Infection	1,200,000
Number unaware of HIV Infection	230,000
Annual New Infections	56,300


00:00:09:30
DAYS
HOURS
MINUTES
SECONDS
Every 9½ minutes, someone in the U.S. is infected with HIV

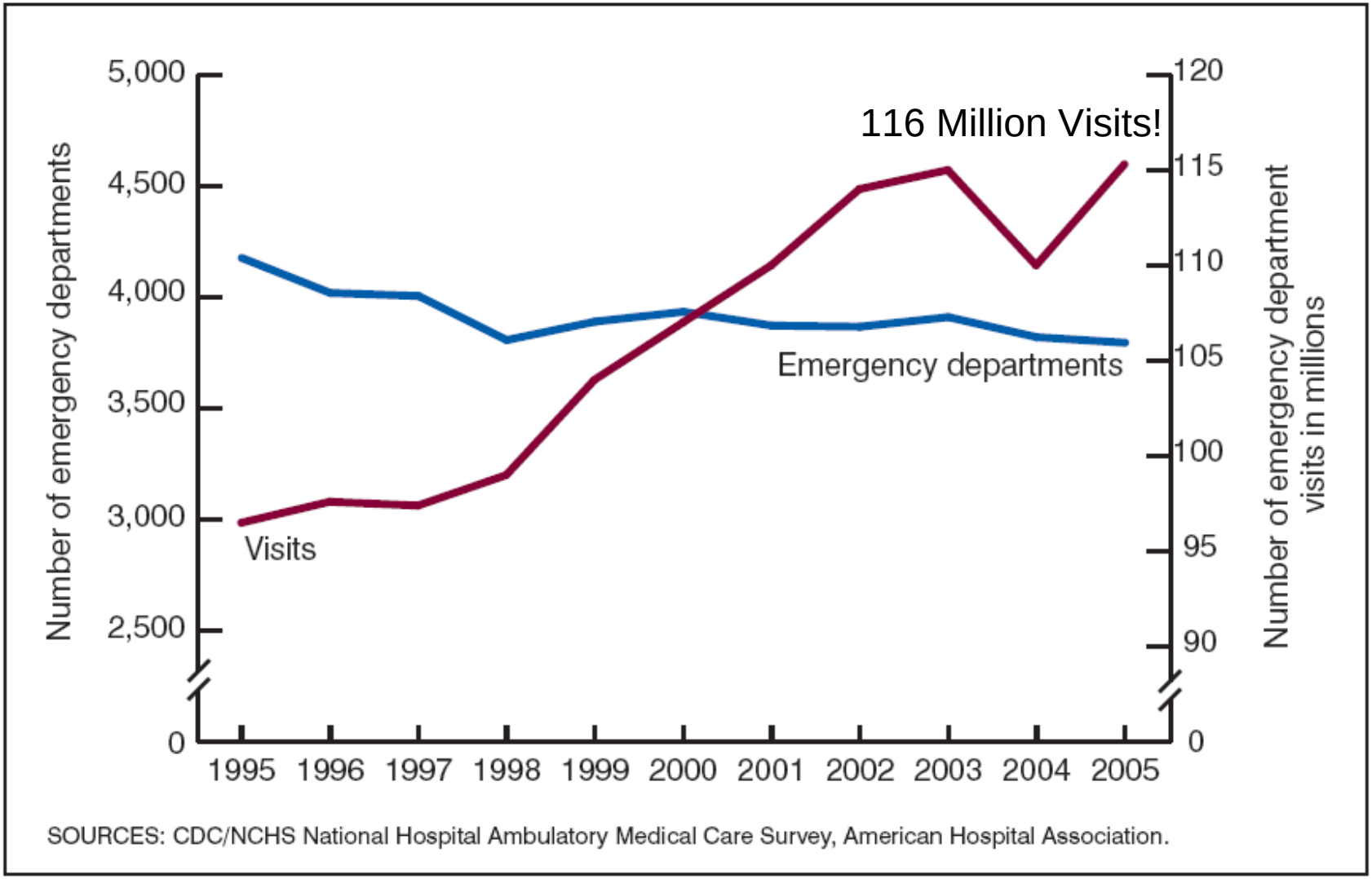
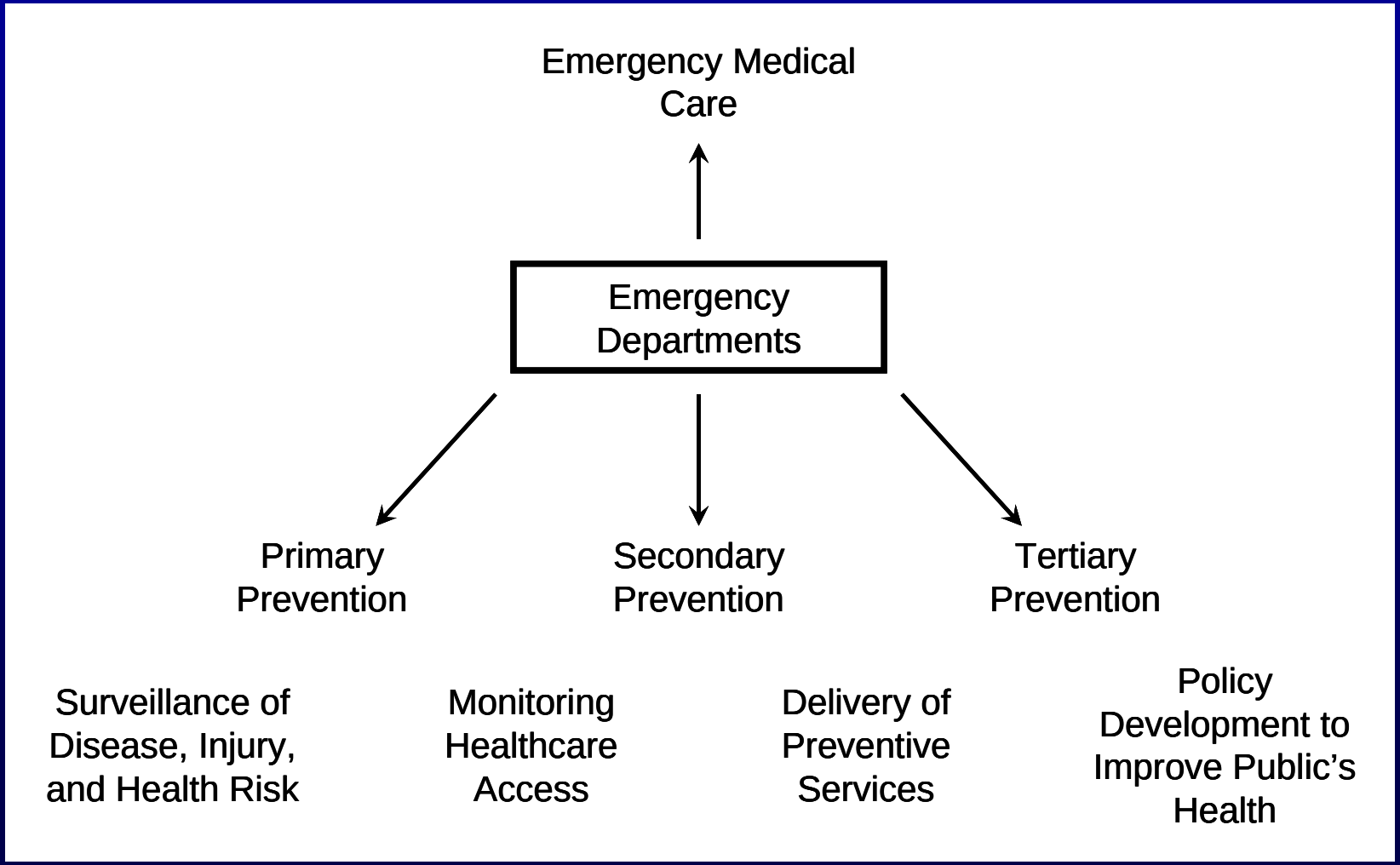


Figure 1. Trends in numbers of emergency departments and related visits: United States, 1995–2005

EDs and Public Health



HIV Impacts the ED

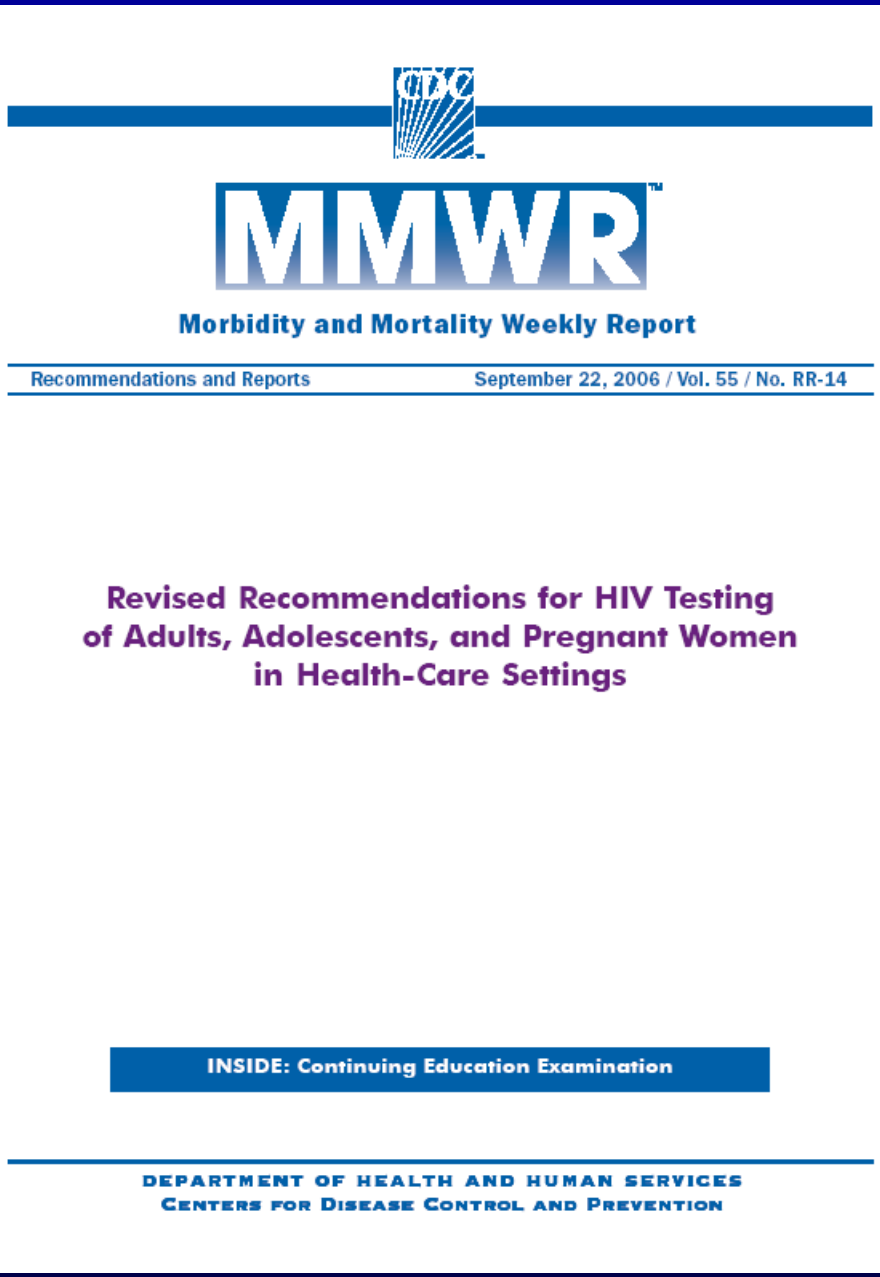
Racial and Ethnic Minorities

Heterosexual Men and Women

Economically Disadvantaged

Under- or Uninsured

No Primary Care



MMWR

Morbidity and Mortality Weekly Report

Recommendations and Reports — September 22, 2006 / Vol. 55 / No. RR-14

Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings

INSIDE: Continuing Education Examination

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

CDC Recommendations Summary

Routine (non-targeted) HIV screening in all healthcare settings with undiagnosed prevalence ≥0.1% for patients aged 13 to 64 years

Voluntary testing using an opt-out approach

Integrated consent for HIV testing

Streamline prevention counseling

"Treatment with highly active antiretroviral therapy is widely available and is more effective when started earlier in the course of HIV infection."

"…persons who are aware of their HIV infection are much less likely to transmit HIV."

Rapid tests "have made testing more feasible in a variety of venues."

"Thus, the potential benefits of routine HIV screening include improved public health outcomes and improved disease prevention…"

GUIDANC
HIV TE

World Health Organization

Evidence Synthesis

Number 46

Screening for Human Immunodeficiency Virus: Focused Update of a 2005 Systematic Evidence Review for the U. S. Preventive Services Task Force

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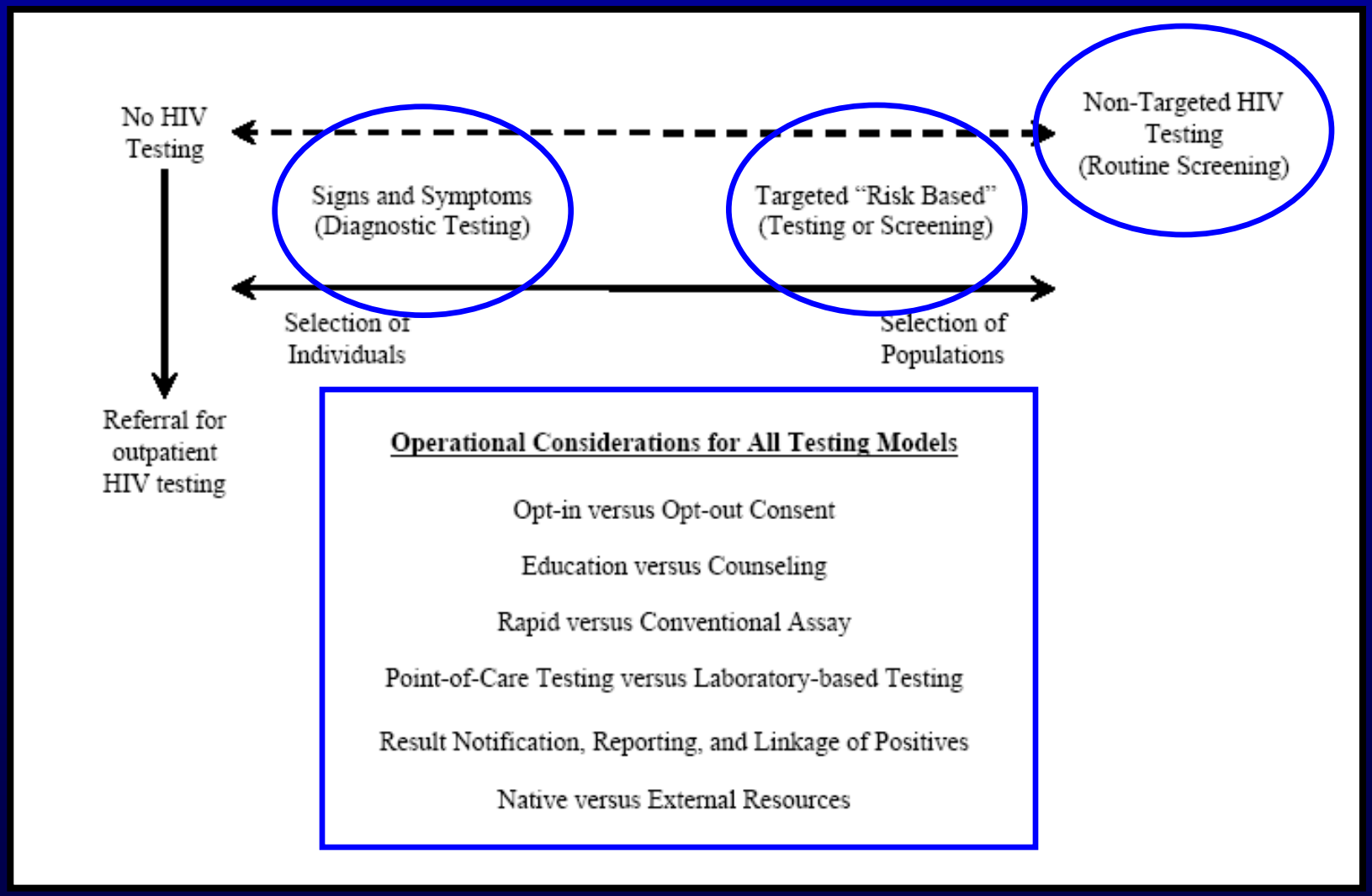
Strategies for Uncovering HIV




DENVER EMERGENCY DEPARTMENT
HIV TESTING RESEARCH CONSORTIUM

Development and Implementation of a Model to Improve Identification of Patients Infected with HIV Using Diagnostic Rapid Testing in the Emergency Department

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Abstract

Objectives: Infection with the human immunodeficiency virus (HIV) continues to expand in nontraditional risk groups, and the prevalence of undiagnosed infection remains relatively high in the patient populations of urban emergency departments (EDs). Unfortunately, HIV testing in this setting remains uncommon. The objectives of this study were 1) to develop a physician-based diagnostic rapid HIV testing model, 2) to implement this model in a high-volume urban ED, and 3) to prospectively characterize the patients who were targeted by physicians for testing and determine the proportions who completed rapid HIV counseling, testing, and referral; tested positive for HIV infection; and were successfully linked into medical and preventative care.

Methods: An interdisciplinary group of investigators developed a model for performing physician-based diagnostic rapid HIV testing in the ED. This model was then evaluated using a prospective cohort study design. Emergency physicians identified patients at risk for undiagnosed HIV infection using clinical judgment and consensus guidelines. Testing was performed by the hospital's central laboratory, and clinical social workers performed pretest and posttest counseling and provided appropriate medical and preventative care referrals, as defined by the model.

Results: Over the 30-month study period, 105,856 patients were evaluated in the ED. Of these, 681 (0.64%; 95% confidence interval [CI] = 0.60% to 0.69%) were identified by physicians and completed rapid HIV counseling, testing, and referral. Of the 681 patients, 15 (2.2%; 95% CI = 1.2% to 3.6%) patients tested positive for HIV infection and 12 (80%; 95% CI = 52% to 96%) were successfully linked into care.

Conclusions: A physician-based diagnostic HIV testing model was developed, successfully implemented, and sustained in a high-volume, urban ED setting. While the use of this model successfully identified patients with undiagnosed HIV infection in the ED, the overall level of testing remained low. Innovative testing programs, such as nontargeted screening, more specific targeted screening, or alternative hybrid methods, are needed to more effectively identify undiagnosed HIV infection in the ED patient population.

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Keywords: HIV, identification, prevention, diagnostic rapid testing, targeted testing, emergency department

Routine Opt-Out Rapid HIV Screening and Detection of HIV Infection in Emergency Department Patients

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Context The Centers for Disease Control and Prevention (CDC) recommends routine (nontargeted) opt-out HIV screening in health care settings, including emergency departments (EDs), where the prevalence of undiagnosed infection is 0.1% or greater. The utility of this approach in EDs remains unknown.

Objective To determine whether nontargeted opt-out rapid HIV screening in the ED was associated with identification of more patients with newly diagnosed HIV infection than physician-directed diagnostic rapid HIV testing.

Design, Setting, and Patients Quasi-experimental equivalent time-samples design in an urban public safety-net hospital with an approximate annual ED census of 55 000 patient visits. Patients were 16 years or older and capable of providing consent for rapid HIV testing.

Interventions Nontargeted opt-out rapid HIV screening and physician-directed diagnostic rapid HIV testing alternated in sequential 4-month time intervals between April 15, 2007, and April 15, 2009.

Main Outcome Measures Number of patients with newly identified HIV infection and the association between nontargeted opt-out rapid HIV screening and identification of HIV infection.

Results In the opt-out phase, of 28 043 eligible ED patients, 6933 patients (25%) completed HIV testing (6702 patients were screened; 231 patients were diagnostically tested). Ten of 6702 patients (0.15%; 95% CI, 0.07%-0.27%) who did not decline HIV screening in the opt-out phase had new HIV diagnoses, and 5 of 231 patients (2.2%; 95% CI, 0.7%-5.0%) who were diagnostically tested during the opt-out phase had new HIV diagnoses. In the diagnostic phase, of 29 925 eligible patients, 243 (0.8%) completed HIV testing. Of these, 4 patients (1.6%; 95% CI, 0.5%-4.2%) had new diagnoses. The prevalence of new HIV diagnoses in the opt-out phase (including those diagnostically tested) and in the diagnostic phase was 15 in 28 043 (0.05%; 95% CI, 0.03%-0.09%) and 4 in 29 925 (0.01%; 95% CI, 0.004%-0.03%), respectively. Nontargeted opt-out HIV screening was independently associated with new HIV diagnoses (risk ratio, 3.6; 95% CI, 1.2-10.8) when adjusting for patient demographics, insurance status, and whether diagnostic testing was performed in the opt-out phase. The median CD4 cell count for those with new HIV diagnoses in the opt-out phase (including those diagnostically tested) and in the diagnostic phase was 69/μL (IQR, 17-430) and 13/μL (IQR, 11-15) , respectively ($P = .02$).

Conclusion Nontargeted opt-out rapid HIV screening in the ED, vs diagnostic testing, was associated with identification of a modestly increased number of patients with new HIV diagnoses, most of whom were identified late in the course of disease.

JAMA. 2010;304(3):284-292 www.jama.com

INFECTION WITH THE HUMAN IMMUNODEFICIENCY virus (HIV) remains an important public health problem. It is estimated that more than 1 million people in the United States are infected with HIV, while approximately 230 000 infections remain undiagnosed.[1] Additionally, approximately 56 000 people are newly infected each year.[2]

Testing for HIV infection remains an important preventive strategy, and in 2006, the Centers for Disease Control and Prevention (CDC) published revised guidelines for performing HIV testing in health care settings.[3] The new guidelines represented a substantial

For editorial comment see 348.

Author Affiliations and **Denver Emergency Department HIV Opt-Out Study Group** members are listed at the end of this article.

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Variable	Newly-Diagnosed HIV Infection RR	(95% CI)	All-Diagnosed HIV Infection RR	(95% CI)
Non-targeted screening	3.6	(1.2 – 10.8)	3.5	(1.3 – 9.3)
Diagnostic testing during non-targeted screening	56.3	(21.1 – 150.3)	71.3	(33.1 – 153.3)
Age	1.0	(0.9 – 1.0)	1.0	(0.9 – 1.0)
Male gender	4.6	(1.6 – 13.2)	4.5	(1.5 – 13.5)
Race/ethnicity				
African American	0.9	(0.2 – 3.4)	1.5	(0.5 – 5.1)
Hispanic	1.3	(0.5 – 3.0)	1.9	(0.8 – 4.2)
Other	1.9	(0.4 – 8.4)	1.8	(0.4 – 7.9)
Insurance				
State sponsored	5.4	(1.3 – 23.8)	5.1	(1.1 – 24.5)
Uninsured	1.4	(0.3 – 7.3)	2.7	(0.6 – 13.1)
Medicare / Medicaid	3.6	(0.8 – 16.7)	3.4	(0.7 – 17.2)

Kiosks and Consent

	Kiosk-Based Opt-Out Screening†	Kiosk-Based Opt-In Screening†
Duration	31 days	31 days
Total number of eligible patients	5,789	5,328
Number of patients offered a rapid HIV test	5,551	5,127
Number of patients who agreed to be tested at kiosk or MSE	3,365	831
Total number of patients tested	1,002	441
Number of patients tested per day	32	14
Number of patients screen tested	884	389
Number of patients diagnostically tested	118	52

Understanding Opt Out

Table. Patient understanding of kiosk-based opt-out and opt-in consent for rapid HIV testing in the emergency department and adult urgent care center, Denver, Colorado.

	Agreed Using Kiosk-Based Opt-Out Consent		Agreed Using Kiosk-Based Opt-In Consent		
	N	(%)	N	(%)	*p*
Not informed about HIV test*	108 / 201	(54)	2 / 80	(3)	<0.001
Did not agree to an HIV test†	32 / 84	(38)	2/ 74	(3)	<0.001

* All patients were asked, "During your visit today, were you informed that a free HIV test would be performed unless you declined?" or "During your visit today, were you offered a free HIV test?"

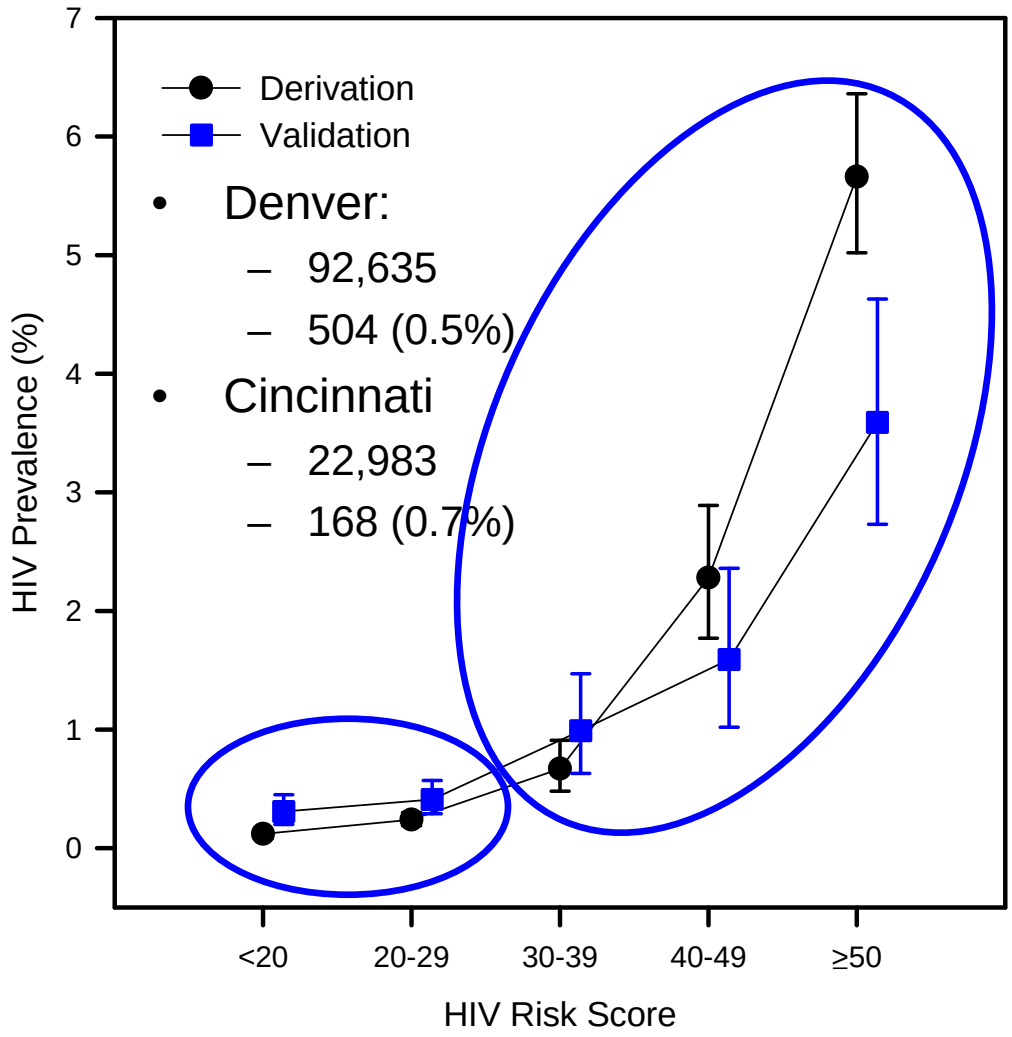
† Patients who indicated they were informed that consent was being obtained for HIV testing were asked, "Did you agree to a free HIV test today?"

Targeted Screening All Over Again

Table. The Denver HIV Risk Score.

Variable	β	(95% CI)	Score
Age			
<22 or >60 years	ref	-	0
22-25 or 55-60 years	0.4	(0.3 – 0.8)	+4
26-32 or 47-54 years	1.0	(0.7 – 1.3)	+10
33-46 years	1.1	(0.8 – 1.4)	+12
Gender			
Female	ref	-	0
Male	2.1	(1.8 – 2.4)	+21
Race/Ethnicity			
Black	0.9	(0.7 – 1.1)	+9
Hispanic	0.3	(0.1 – 0.5)	+3
Other*	-0.1	(-0.3 – 0.1)	0
White	ref	-	0
Sexual Practices			
Sex with a male	2.3	(2.0 – 2.6)	+22
Vaginal intercourse	-1.1	(-0.9 – -1.3)	-10
Receptive anal intercourse	0.4	(0.2 – 0.6)	+8
Other Risks			
Injection drug use	0.8	(0.6 – 1.1)	+9
Past HIV test	-0.4	(-0.2 – -0.6)	-4

*Represents American or Alaskan Native, Native Hawaiian, or non-Hawaiian Pacific Islander.


Derivation
Validation
• Denver:
– 92,635
– 504 (0.5%)
• Cincinnati
– 22,983
– 168 (0.7%)
HIV Prevalence (%)
0
1
2
3
4
5
6
7
<20
20-29
30-39
40-49
≥50
HIV Risk Score

1. All EDs and should provide some form of HIV testing

Epicenter of healthcare encounters among those most at risk in the U.S.

Pilot and demonstration projects confirm feasibility

Although unknown, it is likely that a small proportion of the ~4,000 EDs in the U.S. perform HIV testing

2. The most effective testing approach is still unknown

- Growing understanding of impact of programmatic features
- Screening is likely a valuable approach
- Limited number of clinical trials

3. Integration of testing into clinical environment is important to sustainability

- Allows for flexibility
- Maximizes resource utilization

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