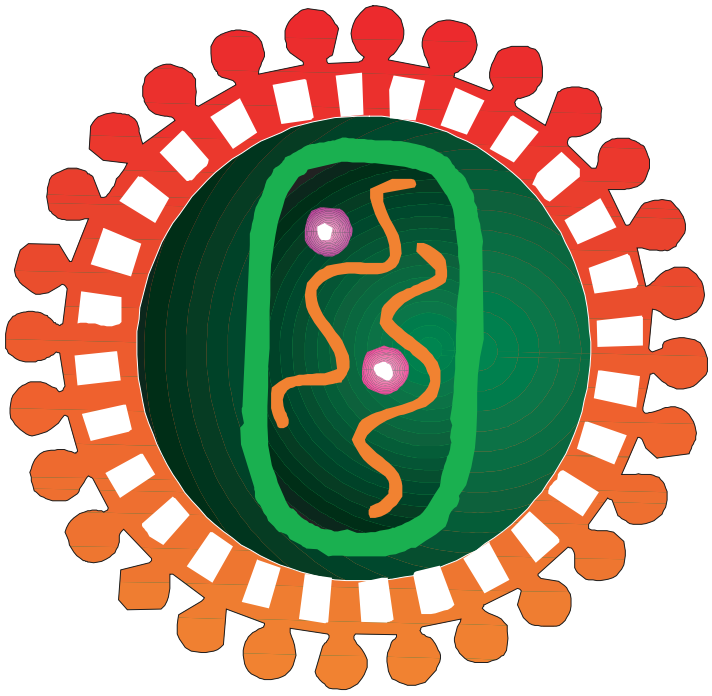
MPEP

HIV Rapid Testing

Report of Sample Shipment Results, June 2006



DEPARTMENT OF HEALTH & HUMAN SERVICES

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

HIV-1 Rapid Testing MPEP June 2006 Report of Results

Report of the June 2006 Human Immunodeficiency Virus Type 1 (HIV-1) Rapid Testing (RT) Performance Evaluation Sample Results Provided by Participant Facilities in the Model Performance Evaluation Program (MPEP), Centers for Disease Control and Prevention (CDC).

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MPEP acknowledges the contributions of Courtney Rodi, B.A., of Constella Group, LLC and Pam Robinson of CDC for their help in preparing this report.

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Donor Report

HIV Rapid Testing MPEP June 2006
Panel and Vial Designations, CDC Donor Bulk Numbers, CDC HIV Rapid Test Results and Donor HIV Status

Panel Letter	Vial Label	CDC Donor Bulk Number	CDC Test Result[1,3]	Donor HIV Status	Laboratory Interpretation[2] and/or Results	
					Test Result	Interpretation
A	A1	5	Negative	Uninfected	_____	_____
	A2	10	Positive (W)	Infected	_____	_____
	A3	14	Positive (S)	Infected	_____	_____
	A4	16	Positive (W)	Infected	_____	_____
	A5	19*	Positive (W)	Infected	_____	_____
	A6	18*	Positive (S)	Infected	_____	_____
B	B1	19*	Positive (W)	Infected	_____	_____
	B2	18*	Positive (S)	Infected	_____	_____
	B3	16	Positive (W)	Infected	_____	_____
	B4	14	Positive (S)	Infected	_____	_____
	B5	10	Positive (W)	Infected	_____	_____
	B6	5	Negative	Uninfected	_____	_____
C	C1	14	Positive (S)	Infected	_____	_____
	C2	18*	Positive (S)	Infected	_____	_____
	C3	16	Positive (W)	Infected	_____	_____
	C4	5	Negative	Uninfected	_____	_____
	C5	10	Positive (W)	Infected	_____	_____
	C6	19*	Positive (W)	Infected	_____	_____
D	D1	16	Positive (W)	Infected	_____	_____
	D2	14	Positive (S)	Infected	_____	_____
	D3	19*	Positive (W)	Infected	_____	_____
	D4	18*	Positive (S)	Infected	_____	_____
	D5	10	Positive (W)	Infected	_____	_____
	D6	5	Negative	Uninfected	_____	_____

[1] The CDC result was obtained after pre-shipment testing for the presence of HIV-1 antibody with all commercially available HIV Rapid Testing kits licensed by the Food and Drug Administration (FDA) and with selected FDA-licensed Enzyme Immunoassay (EIA) kits. The CDC result is consistent with the manufacturers' criteria for interpretation of results.

[2] Laboratory Interpretation space (to be completed by participant laboratory) provided to facilitate comparison of participant laboratory result with CDC result.

[3] Strong (S) and Weak (W) designations are based on qualitative observations of the titrated colorimetric test results for reactive samples.

Note: an asterisk (*) denotes an experimental sample – see page 7 for details.

Report of Results: Overview

Purpose

This report describes the results of the eighth HIV Rapid Testing Model Performance Evaluation Program (HIV-RT MPEP) shipment survey. It represents a collection of results reported by a variety of testing sites using different HIV rapid test kits on six samples.

For the second time, experimental samples designed for long-term stability at ambient temperature were included for evaluation. The experimental samples were the same HIV-positive samples, designated Donor 18 and Donor 19, as in the December 2005 survey. These samples may have potential for use in proficiency testing and quality control where access to cold storage is limited.

The six survey samples included these two experimental samples and four MPEP plasma samples from four individual donors.

The major findings are summarized below.

Response rate

The survey shipment was sent to 553 testing sites within and outside of the United States. Responses were received from 483 (87.3%) of the testing sites. Of those responding:

- 422 (87.4%) were U.S. testing sites, and
- 61 (12.6%) were non-U.S. testing sites.

Note:
Thirteen testing sites submitted multiple result forms, indicating the use of from one to four different test kits, so that the total number of responses was 499.

Overall performance

Overall accuracy (percent of correct results) for all samples, by all sites with all kit types, was 98.0% (2917/2977). "Indeterminate" result interpretations were considered to be incorrect, and "Invalid" result interpretations were not included in the analyses. Fifteen of the false negative results and three of the false positive results were reported by three laboratories that reported incorrect results for all six samples. Seventeen invalid results were reported by thirteen testing sites. These tended to be related to the use of flow-through devices, e.g., absorption difficulties.

A summary of results for all challenges is shown in the following table:

Table 2: Percentages of positive and negative results by donor/sample type

			Positive Donors			Negative Donors			
Sample Type	Total # of facilities	Total # of Results	Positive/ Reactive Results	Ind*	False Negative (% False Neg.)	Negative/ Non-Reactive Results	Ind	False Positives (% False Pos.)	Overall Performance (TP + TN/Total # of Results)
Plasma Samples	483	1982	1468	5 (0.3%)	16 (1.1%)	482	4 (0.8%)	7 (1.5%)	98.4%
Experimental Samples	483	995	967	2 (0.2%)	26 (2.7%)	n/a	n/a	n/a	97.2%**

*Ind = Indeterminate
**Based on positive samples only.

Continued on next page

Report of Results: Overview, Continued

Matched Survey samples: June 2006 & Dec. 2005

The samples in the current survey (June 2006) were matched (i.e. the same samples) as the corresponding donors in the December 2005 survey.

MPEP plasma samples, summary results

The routine MPEP plasma positive challenges included one strong positive sample (donor 14) and two weak positive samples (Donors 10 and 16).

- Of the 21 incorrect results reported for the positive challenges (false negatives and indeterminates):
  - 9 (42.9%) were reported for Donor 10,
  - 6 (28.6%) were reported for Donor 14, and
  - 6 (28.6%) were reported for Donor 16.
  - Overall accuracy for MPEP plasma positive samples was 98.6% (1468/1489).
  - Accuracy varied with test kit used (97.1% - 100%).
  - 3/16 false negative and 4/5 indeterminate results were reported by participants using the MedMira Reveal G2 Rapid HIV-1 Antibody Test kits.
  - 11/16 false negative results were reported by participants using the OraQuick ADVANCE Rapid HIV-1/2 Ab Test (OraSure) test. Nine of these were reported by three laboratories that missed all samples.
  - Overall accuracy for natural samples was 98.4% (1950/1982).
- Seven false positive and four indeterminate results were reported on the **negative challenge** (Donor 5).
  - Overall accuracy was 97.8% (482/493).
  - Three of the false positive results were reported by laboratories that missed all samples.

Experimental samples, summary results

- The experimental **positive challenges** included the strong positive sample, Donor 18 and the weak positive sample, Donor 19.
  - Twenty-eight incorrect results were reported on these experimental samples, of these:
    - there were 26 false negative and 2 indeterminate results,
    - 10 incorrect results were reported for the strong positive sample, Donor 18, and 18 incorrect results were reported for the weak positive sample, Donor 19.
  - Of the 26 false negative results for the experimental samples:
    - 15 (57.7%) were reported by testing sites using the MedMira Reveal G2 Rapid HIV-1 Antibody Test, and
    - 7 (26.9%) were reported by testing sites using the OraSure OraQuick ADVANCE Rapid HIV 1/2 Antibody Test. Of these seven, six were reported by three laboratories that missed all samples.
  - Accuracy varied with test kit used (83.3 – 100%).
    Overall accuracy for experimental positive samples was 97.2% (967/995).

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Report of Results: Overview, Continued

Changes in Specimen Type

- **Oral fluid (oral mucosal transudate) as a specimen type:**
  - was indicated in 88 (18.2%) responses by sites using the OraSure OraQuick ADVANCE Rapid HIV-1/2 test kit,
  - showed a slight decrease in usage from the 98 (20.6%) responses reported to MPEP in the December 2005 survey,
  - was used primarily in the U.S. (86/88, 97.7%) by sites identified as:
    - community-based organizations (25/88, 28.4%),
    - counseling and testing centers (25/88, 28.4%), and
    - health departments (20/88, 22.7%)
- Several U.S. sites reported testing specimen types which are not FDA-approved for the test kit used. Using alternative specimen types is a modification of the manufacturer's procedure and in the case of waived test kits, changes their categorization to nonwaived. These modifications must be verified by the individual laboratory and appropriate CLIA standards must be met.
  - 49 participants indicated that they normally test either serum or frozen plasma samples with the OraQuick ADVANCE HIV-1/2 Antibody test kits.

Confirmatory testing practices

Twenty-five U.S. testing sites indicated that only EIA (in-house or sent out) was done for confirmation of a preliminary positive (reactive) rapid test result.

CDC guidelines state that reactive rapid HIV tests should be confirmed with Western blot (WB) or indirect immunofluorescence assay (IFA) even if a subsequent EIA is nonreactive. ***It is the responsibility of each testing site to ensure that appropriate guidelines are being followed*** regardless of where the confirmatory tests are performed.

Challenge Samples

Sample Description

The plasma samples for this challenge shipment of the HIV-RT MPEP were shipped in June 2006. These samples were matched (i.e. the same donors) as the corresponding donors shipped for the December 2005 survey, and serostatus (positive vs. negative) was the same. Weak positive vs. strong positive serostatus was defined based upon signal/cutoff ratios using the Vironostika HIV-1 Microelisa System antibody test from Organon Teknika.

The six samples for this shipment were:

- four MPEP plasma samples from four donors:
  - one strong HIV-1 antibody positive
  - two weak HIV-1 antibody positive, and
  - one HIV-1 antibody-negative.
- two HIV-1 antibody positive experimental samples (one weak positive and one strong positive).

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Challenge Samples (Continued)

Description of challenge samples

All "natural" plasma samples were single bleeds drawn from individual donors. The experimental samples were made from HIV-infected plasma that was chemically stabilized using a proprietary process.

The samples for the June 2006 HIV Rapid Testing MPEP survey were processed as follows:

- All donor samples were clarified prior to dispensing and tested to ensure they were free of bacterial contamination.
- HIV-1 antibody-positive plasma samples were heat-treated at 56ºC for 60 minutes to inactivate infectious agents, whereas HIV-antibody-negative samples were not heat-treated.
- The serostatus of both positive and negative samples was confirmed by all FDA-approved rapid HIV antibody tests as well as selected FDA-approved EIA and Western blot kits.
- Negative samples were negative for HIV-1 antigen using an FDA-approved monoclonal antibody-based p24 antigen test.
- Positive samples were confirmed positive using the following criteria:
    - reactive by the Genetic Systems rLAV enzyme immunoassay (EIA) , and
    - positive by the APHL/CDC interpretive criteria for Western blot (WB) patterns.

Demographics

Overview

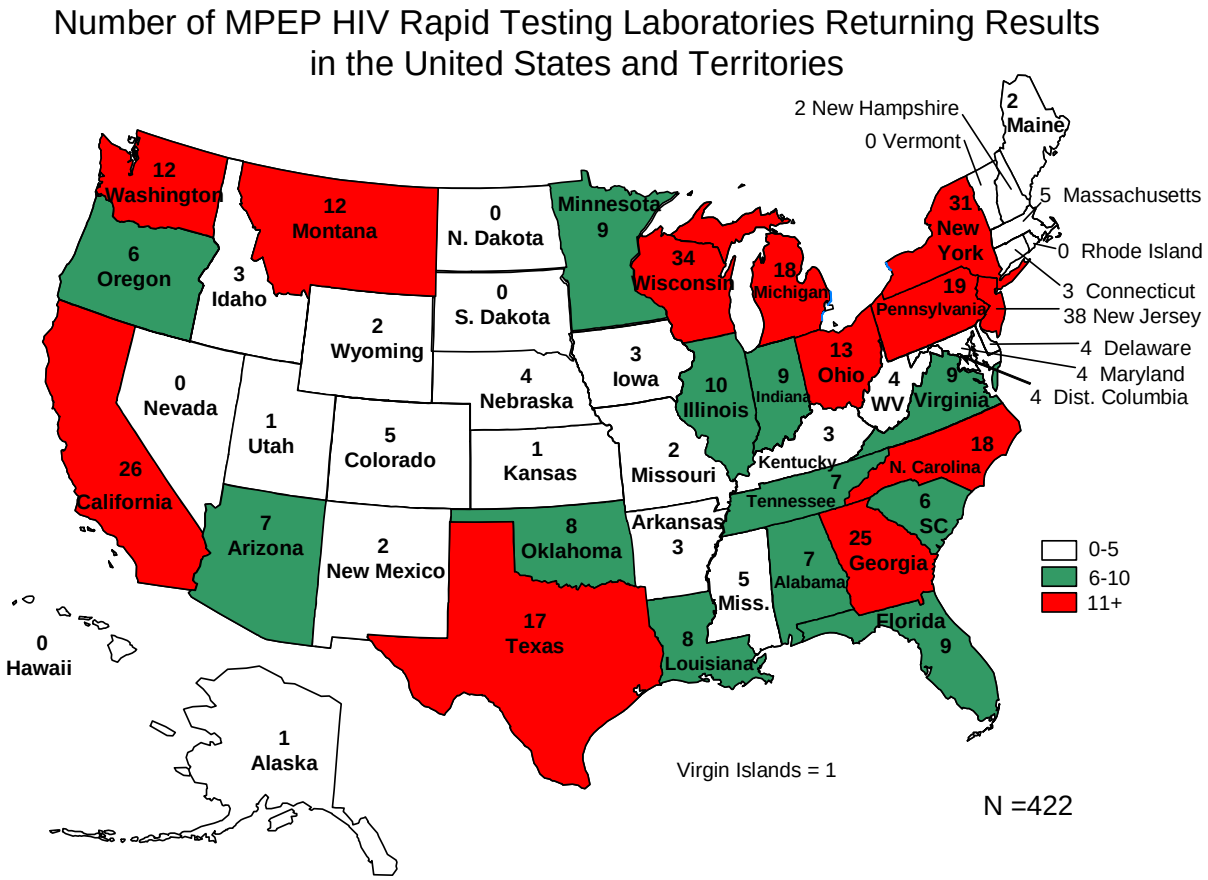
A total number of 483 different testing sites (foreign and domestic) submitted results. Of these:

- the 422 domestic testing sites are depicted in ***Figure 1***, and
- the 61 non-U.S. testing sites are listed in ***Table 3***.

The types of testing site participants responding are depicted in ***Figure 2***:

- The number of non-U.S. participants in the current survey (61) was similar to the previous survey (December 2005, n = 65).
- Non-U.S. participants included over 2/3 of the countries in the Global AIDS Program (GAP).
- The number of U.S. participants in the current survey (422) was greater by ~3% than that of the previous survey (410).
- In the U.S., hospital testing sites predominated.

Figure 1



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Demographics, Continued

The following table shows the breakdown of participants outside the United States.

Table 3

Country	Number	Country	Number
Argentina	1	Kenya	1
Bangladesh	1	Liberia	1
Belgium	1	Malawi	1
Botswana	1	Malaysia	1
Burkina Faso	2	Mali	1
Burundi	1	Nepal	1
Cameroon	1	Nigeria	2
Canada	2	Panama	1
Congo	1	Peru	1
Cote d'Ivoire	1	Philippines	3
Dominican Republic	1	Republic of Yemen	1
Egypt	2	Slovakia	1
El Salvador	1	South Korea	1
Eritrea	1	Suriname	1
Ethiopia	1	Taiwan	1
Germany	1	Tanzania	8
Ghana	1	Thailand	4
Guyana	1	Uganda	1
Honduras	2	Zambia	2
India	2	Zimbabwe	2
Indonesia	1		

N = 61

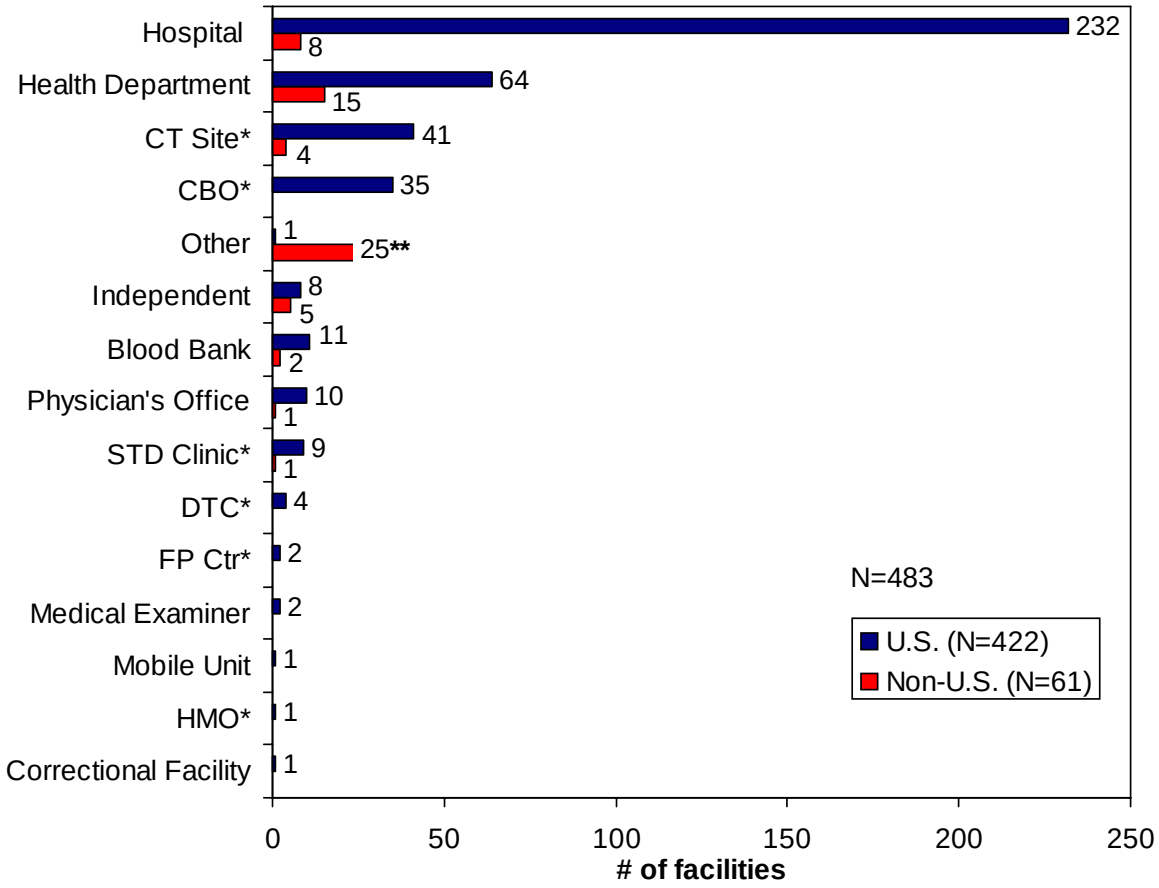
Continued on next page

Demographics, Continued

The types of testing sites for all participants in the current survey are shown in Figure 2, by U.S. and non-U.S. participants.

Figure 2:

Type of Testing sites, by U.S. & non-U.S.



Abbreviations (*):

CBO = Community Based Organization
CT Site = Counseling and Testing site
STD Clinic = Sexually Transmitted Disease Clinic
DTC = Drug Treatment Center
FP Ctr = Family Planning Center
HMO = Health Maintenance Organization

(**) 17/25 were laboratories or medical units associated with U.S. embassies.

Detailed Performance Results

Table 4 gives the results by donor.

Table 4

	Reactivity				
Donor Number	**# of Results**	**# Pos.**	**# Neg.**	**# Indeter**	**% Correct**
5 (Negative)	493	7	482	4	97.8%
10 (Weak Positive)	493	484	5	4	98.2%
14 (Strong Positive)	499	493	5	1	98.8%
16 (Weak Positive)	497	491	6	0	98.8%
18 (Exp* Strong Positive)	498	488	10	0	98.0%
19 (Exp* Weak Positive)	497	479	16	2	96.4%

*Experimental

MPEP plasma samples, detailed performance results

MPEP plasma samples: Negative Sample (Donor 5):

- Seven false positive results were reported. (Three of these were reported by laboratories that missed all samples.)

MPEP routine plasma samples: Positive Samples:

- There were 21 incorrect results on the MPEP plasma positive samples. Of these:
  - 16 were false negative errors, with
    - 5 incorrect results reported for weak positive Donor 10
    - 6 incorrect results reported for weak positive Donor 16
    - 5 incorrect results reported for strong positive Donor 14
  - 9 incorrect results were reported by 3 laboratories that missed all samples.

Experimental samples, detailed performance results

Experimental: Positive Samples:

- There were 28 incorrect results on the experimental positive samples:
  - 26 were false-negative errors,
    - 16 of these were reported for weak positive experimental Donor 19,
    - 10 were reported for experimental strong positive Donor 18, and
    - 6 false-negative errors were reported by 3 laboratories that missed all samples.

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Detailed Performance Results, Continued

Table 5a gives the accuracy by kit type for MPEP plasma samples.

Kit Type (manufacturer)	Reactive/Positive						Non-Reactive/Negative						Totals		
	# of Sites	# of Results	# Reactive	# Non-Reactive	# Indeter	% Correct	# of Sites	# of Results	# Reactive	# Non-Reactive	# Indeter	% Correct	% Correct	# Correct	Total # of Results
Oraquick ADVANCE Rapid HIV-1/2 Ab Test (OraSure)	286	860	848	11*	1	98.6%	286	287	5**	282		98.3%	1147	1130	98.5%
Reveal G2 Rapid HIV-1 Antibody Test (MedMira)	83	242	235	3	4	97.1%	78	78		75	3	96.2%	320	310	96.9%
Determine HIV-1/2 (Abbott)	39	117	115	2		98.3%	39	39	2	36	1	92.3%	156	151	96.8%
Biotech Uni-Gold Recombigen HIV (Trinity)	50	150	150			100.0%	50	49		49		100.0%	199	199	100.0%
Biotech Uni-Gold (Trinity)	6	18	18			100.0%	6	7		7		100.0%	25	25	100.0%
Biotech Capillus (Trinity)	7	21	21			100.0%	6	6		6		100.0%	27	27	100.0%
Multispot HIV-1/HIV-2 (Bio-Rad)	6	18	18			100.0%	6	6		6		100.0%	24	24	100.0%
Genie II HIV-1/HIV-2 (BioRad)	2	6	6			100.0%	2	2		2		100.0%	8	8	100.0%
Serodia HIV 1/2 (Fujirebio)	3	9	9			100.0%	3	3		3		100.0%	12	12	100.0%
HIV 1/2 Stat-Pak (CASSETTE)	1	3	3			100.0%	1	1		1		100.0%	4	4	100.0%
Other	12	45	45			100.0%	12	15		15		100.0%	60	60	100.0%

* 9 of the incorrect results were reported by 3 laboratories that missed all samples.

** 3 of the incorrect results were reported by 3 laboratories that missed all samples.

Table 5b: Results for experimental samples by test kit

Kit Type (manufacturer)	Reactive/Positive						Non-Reactive/Negative						Totals		
	# of Sites	# of Results	# Reactive	# Non-Reactive	# Indeter	% Correct	# of Sites	# of Results	# Reactive	# Non-Reactive	# Indeter	% Correct	% Correct	# Correct	Total # of Results
Oraquick ADVANCE Rapid HIV-1/2 Ab Test (OraSure)	286	574	567	7*	1	98.8%	n/a	n/a	n/a	n/a	n/a	n/a	574	567	98.8%
Reveal G2 Rapid HIV-1 Antibody Test (MedMira)	83	166	150	15	4	90.4%	n/a	n/a	n/a	n/a	n/a	n/a	166	150	90.4%
Determine HIV-1/2 (Abbott)	39	77	77			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	77	77	100.0%
Biotech Uni-Gold Recombigen HIV (Trinity)	50	100	98	1		98.0%	n/a	n/a	n/a	n/a	n/a	n/a	100	98	98.0%
Biotech Uni-Gold (Trinity)	6	12	12			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	12	12	100.0%
Biotech Capillus (Trinity)	7	14	14			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	14	14	100.0%
Multispot HIV-1/HIV-2 (Bio-Rad)	6	12	12			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	12	12	100.0%
Genie II HIV-1/HIV-2 (BioRad)	2	4	4			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	4	4	100.0%
Serodia HIV 1/2 (Fujirebio)	3	6	5	1		83.3%	n/a	n/a	n/a	n/a	n/a	n/a	6	5	83.3%
HIV 1/2 Stat-Pak (CASSETTE)	1	2	2			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	2	2	100.0%
Other	12	28	26	2		92.9%	n/a	n/a	n/a	n/a	n/a	n/a	28	26	92.9%

* 6 of the incorrect results were reported by 3 laboratories that missed all samples.

Kit Types Used By Participants

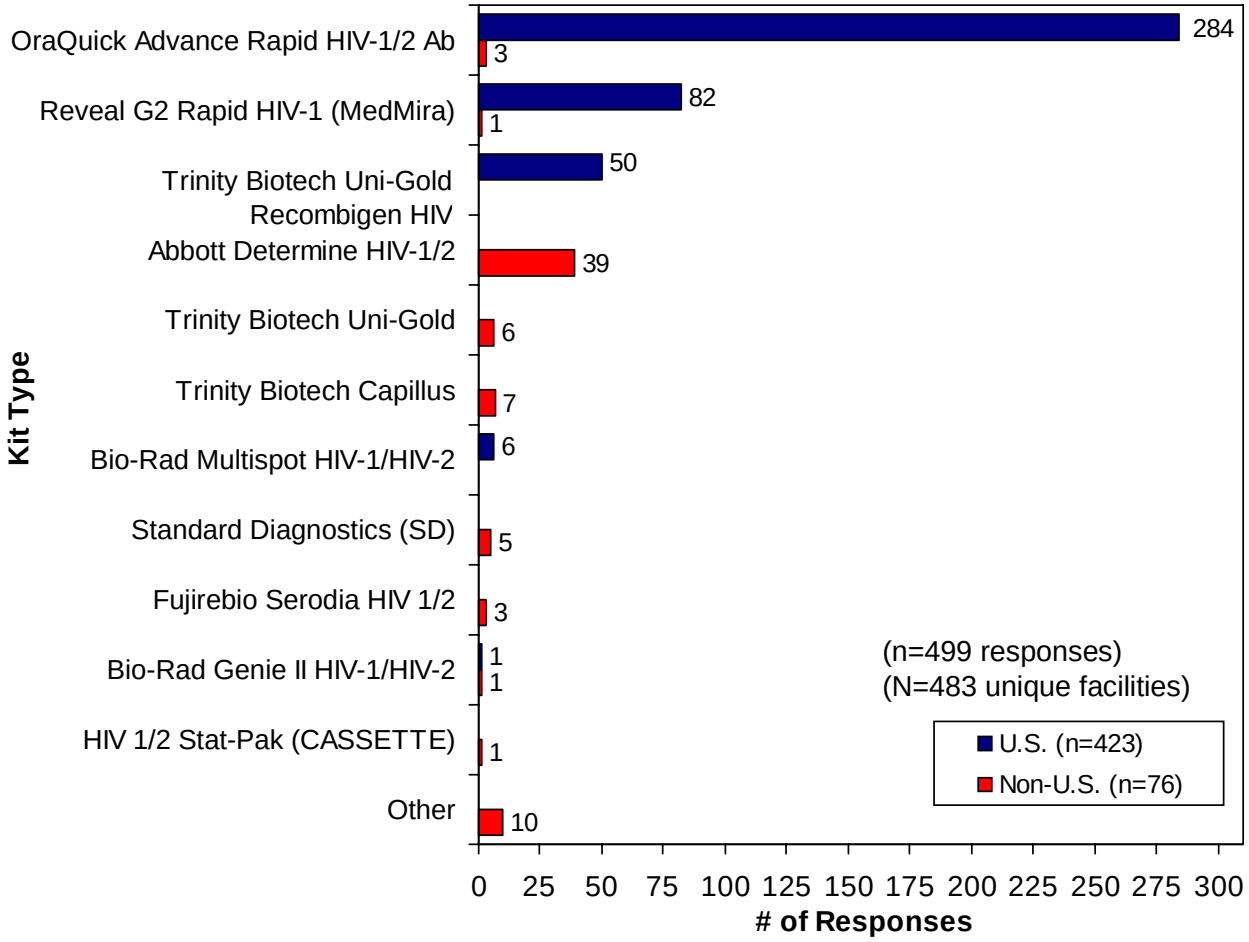
Overview

This section describes the kit types used by participants.

- The predominant kit type used in the U.S. was OraQuick ADVANCE Rapid HIV 1/2 Ab test (67.1%; 284/423, as shown in ***Figure 3***:
- The predominant kit type used in non-U.S. testing sites was Abbott Determine HIV-1/2 test (51.3%; 39/76).
- Kit usage by lab type is shown in ***Figure 4.***

Figure 3:

Kit types



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Kit Types Used By Participants, Continued

The following figure illustrates the usage of the kit types by type of testing site. The methods for which there were twelve or less results are included in the "other kit type" category.

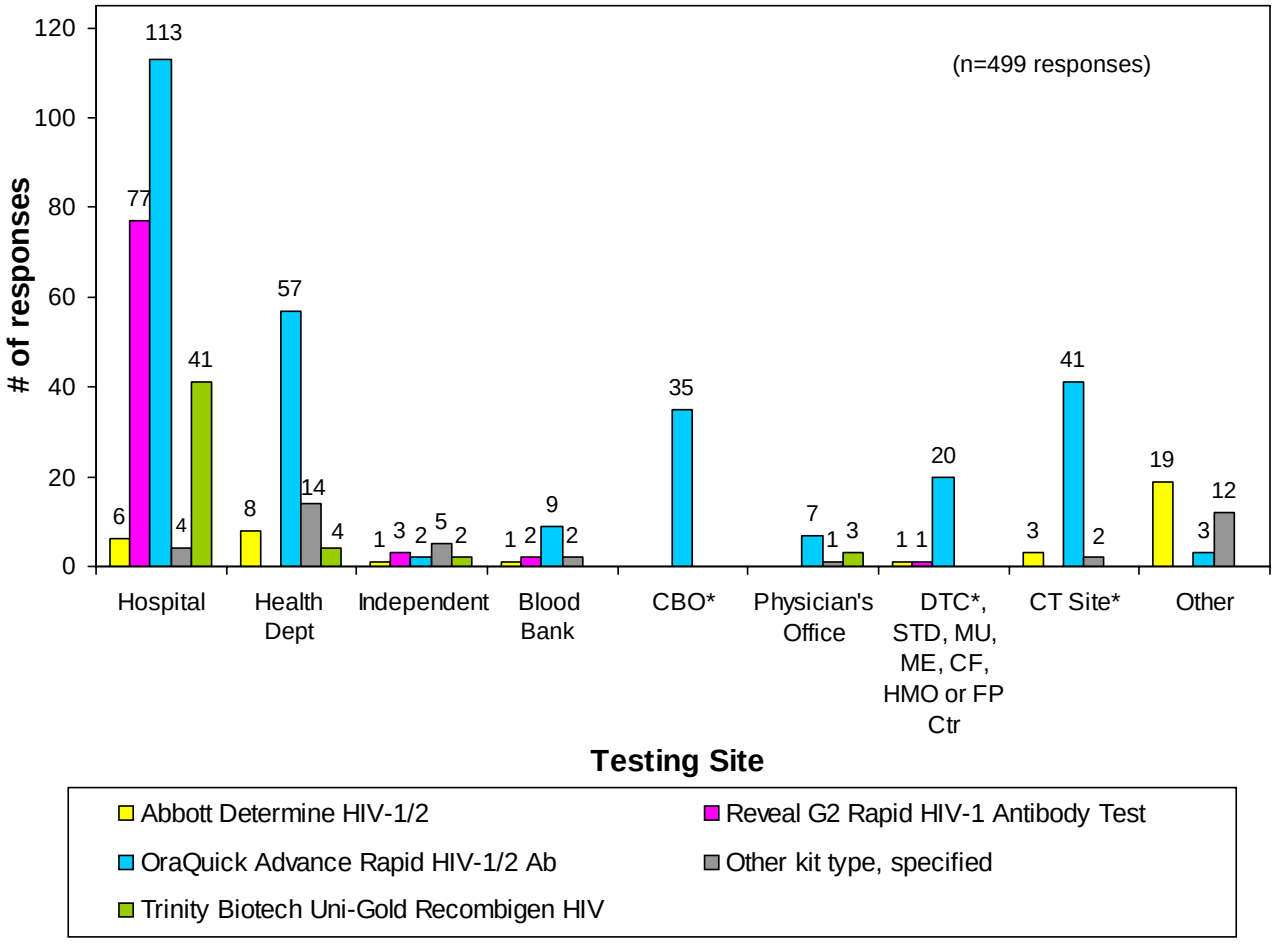
The predominate test kit used was OraQuick ADVANCE Rapid HIV 1/2 Ab Test. The percent of sites using this kit, by type of facility, is as follows:

- hospitals, 46.9%
- health departments, 68.7%
- outreach sites (DTCs, STD clinics, CT sites, FP Ctrs, mobile units)*, 89.7%
- CBOs*, 100%
- blood banks, 64.3%
- physician offices, 63.6%

Note: Some testing sites used more than one type of testing kit.

Figure 4:

Testing site by kit type



*Abbreviations:

CBO = Community Based Organization
DTC = Drug Treatment Center
STD = Sexually Transmitted Disease Clinic
FP Ctr = Family Planning Center
CT Site = Counseling and Testing site
CF = Correctional Facility
ME = Medical Examiner
MU = Mobile Unit
HMO = Health Maintenance Organization

Specimen Types Used By Participants

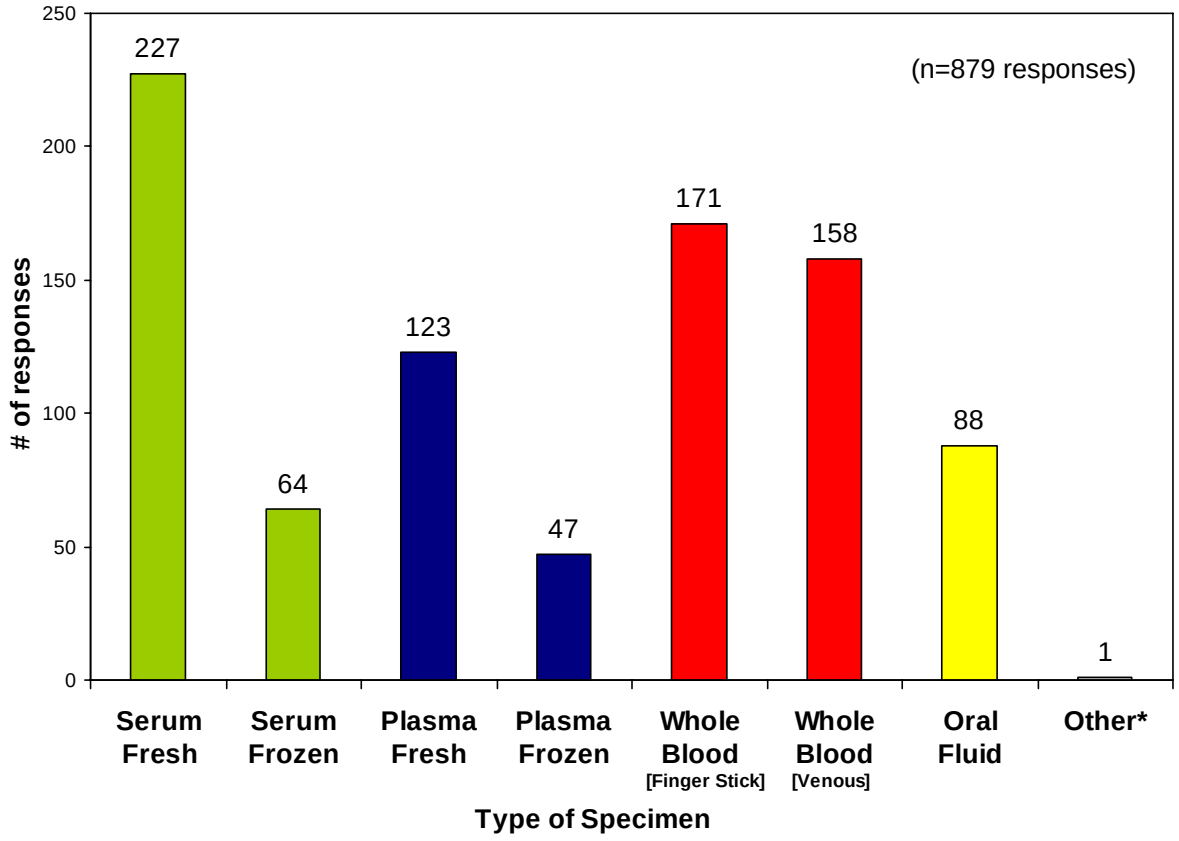
Overview

Participants were asked what type of specimens they normally use for HIV rapid tests.

- The breakdown in specimen types reported is shown in ***Figure 5***.
- Testing sites could report using more than one specimen type.

Figure 5:

Specimen types



* One facility indicated the "Other" specimen type as dried blood spot.

The type of specimen(s) used in performing HIV rapid testing varied by the type of facility and the method of rapid testing (kit type).

The number of reports indicating oral fluid use decreased slightly, with respect to the previous survey, from 98 (20.6%) to 88 (18.2%).

Quality Control (QC)

Overview

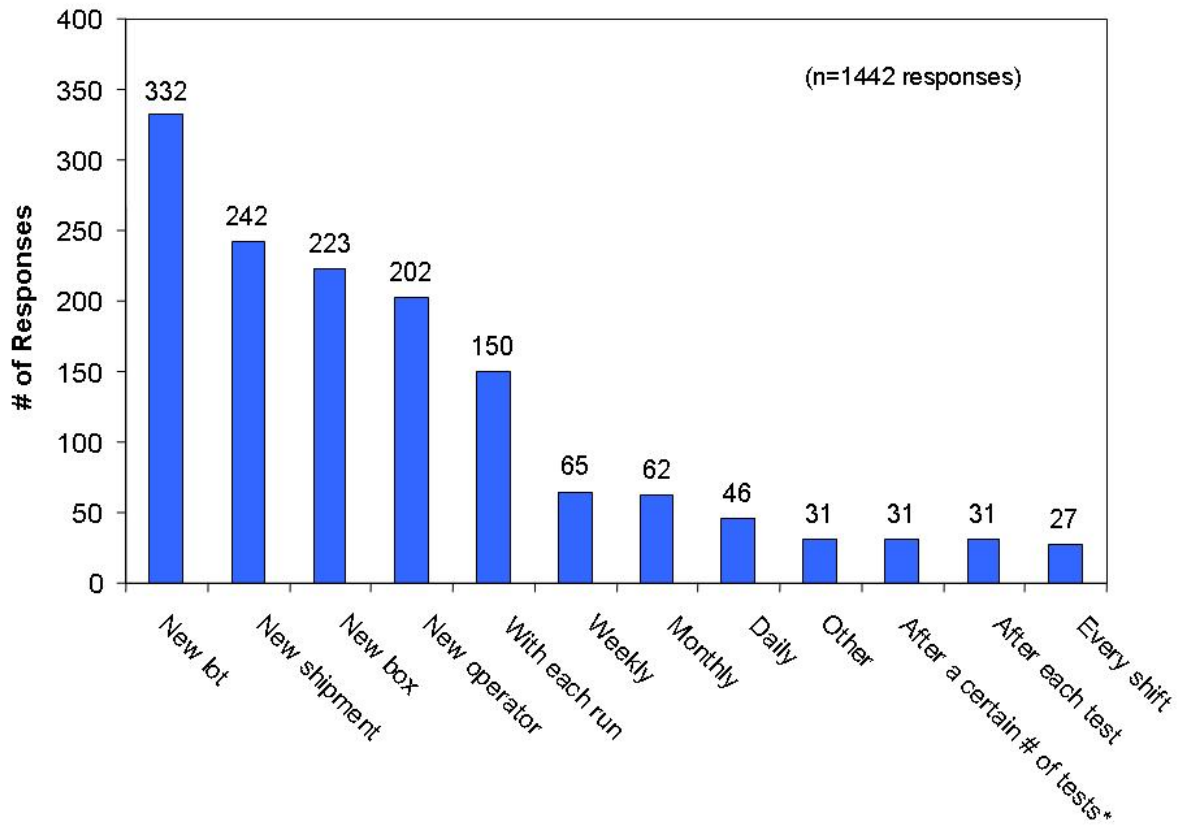
Testing sites were asked if they used quality control (QC) samples, either positive or negative, when performing HIV rapid tests. The frequency of use of quality control materials is shown in ***Figure 6***.

- Of the 483 facilities that returned responses, 455 (94.2%) answered the question regarding use of quality control samples (question #5).
- Most of these facilities (99.6%, 453/455) indicated the use of QC samples for at least one of the kit types they use at their testing site.
- Of the 1260 responses indicating the source(s) from which the QC samples (positive and/or negative) were obtained, the sources identified were as follows:
  - controls obtained from the same manufacturer as the test kit (88.4%, 1114/1260),
    - 37.7% (420/1114) were included in the test kit, and
    - 62.3% (694/1114) were purchased from the kit manufacturer separately.
  - in-house controls (7.6%, 96/1260).
  - "Other" manufacturer (manufacturer not the same as for the test kit) controls (4.0%, 50/1260).

Notes: 1. Testing sites could provide more than one answer.
2. Testing sites reporting the use of multiple kit types answered the question separately for each kit type.

Figure 6:

Frequency of use of quality controls



* The most frequent response was 25 tests (Range 20-30)

Confirmatory Testing

Overview

The types of confirmatory testing reported by laboratories varied as shown in ***Figure 7***.

Note: Testing sites could answer by indicating more than one confirmatory test.

- Most responses (471/803; 58.7%) indicated that reactive (preliminary positive) specimens were sent to another facility.
- In several cases, EIA was performed alone (25/803; 3.1%) or in combination with other testing (181/803; 22.5%).
- Many responses (127/803; 15.8%) indicated using a second rapid test for confirmatory testing. Of these, 14/127 (11.0%) indicated using a second rapid test with no other type of confirmatory testing. (This percentage has decreased somewhat since the last shipment (14.9% in Dec. 2005 vs. 11% in June 2006).

Eighteen responses indicated that no confirmatory testing was required to confirm a positive result for the HIV rapid testing kit listed. ***Note***: Separate report forms are required for each different HIV rapid testing kit used, and participants could have reported different confirmatory testing information on each form.

Fifteen testing sites reported no confirmatory testing use for ***any*** kit type:

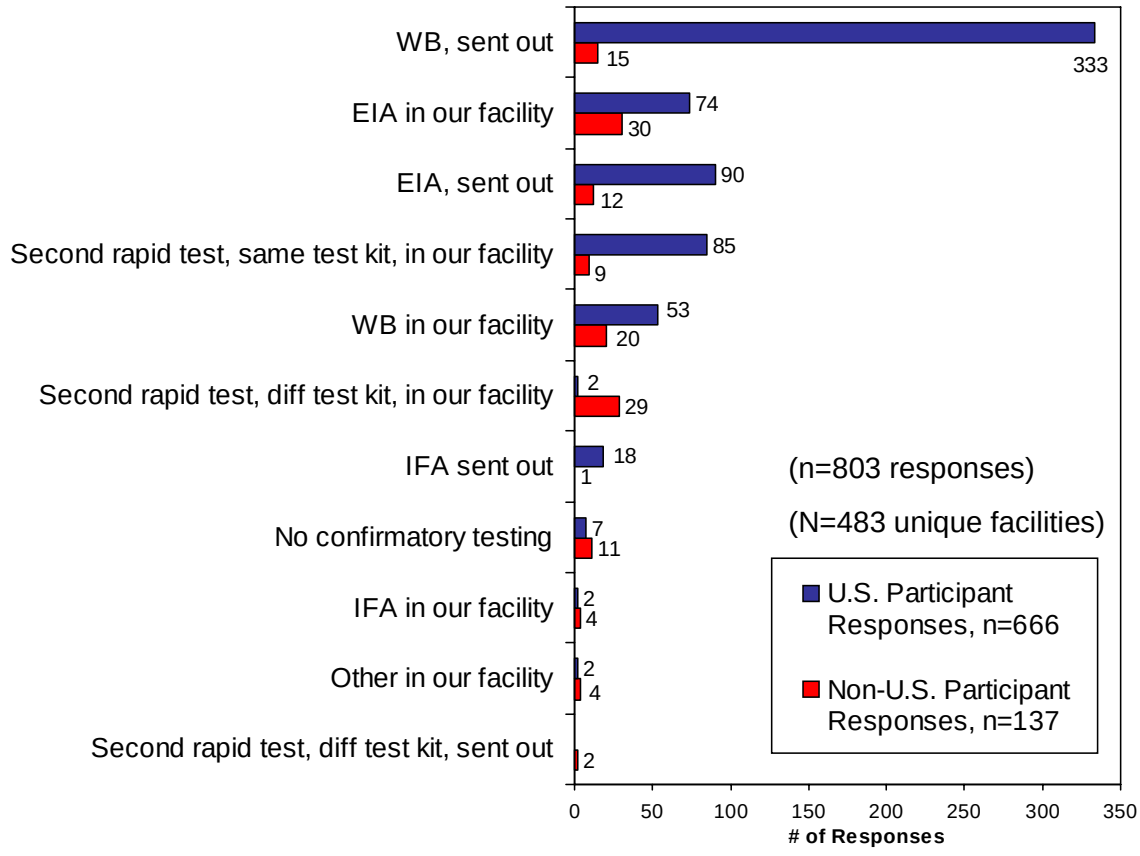
- eight were from non-U.S. sites, and
- seven were from U.S. sites.

Six of these seven U.S. sites indicated that the purpose for which they use HIV rapid testing is for HIV initial testing, such as for patients/clients, needlestick and source patient testing.

The circumstances are unclear regarding the use of HIV rapid tests for initial HIV testing without any confirmatory testing requirement for preliminary positive results.

Figure 7:

Types of confirmatory testing



Conclusions and Discussion

Overall Performance

Overall accuracy in this shipment was 98.0%:

- 98.0% for all 5 positive samples
- 97.8% for the negative sample

The 21 incorrect results reported for positive MPEP plasma samples represent an increase in the number of incorrect results from previous shipments – (1.4% [21/1489] for this shipment vs. 0.3% [4/1464] for the Dec. 2005 shipment). Fifteen incorrect results were reported for weak positive samples.

Twelve of twenty-one (12/21) of these incorrect results were made by laboratories using OraQuick ADVANCE Rapid HIV-1/2 Ab Test resulting in an overall accuracy of 98.6% compared with 99.9% in December 2005. It is important to note that nine of these incorrect results with OraQuick were made by three laboratories that missed all samples.

Seven of twenty-one (7/21) incorrect results for positive samples were reported by laboratories using MedMira Reveal G2 Rapid HIV-1 Antibody Test. Comments indicated that incorrect results with this kit were associated with absorption problems.

The 11 incorrect results reported for negative MPEP plasma samples represent an increase in error rate for negative samples compared with previous shipments. For example, the error rate was 2.2% (11/493) in this shipment compared with 0.6% (3/482) in December 2005. Five of eleven (5/11) of these were reported by laboratories using OraQuick. (Three of the five errors reported with OraQuick were reported by separate laboratories that missed all samples.) Three of eleven (3/11) were reported by laboratories using MedMira Reveal G2.

Performance: MPEP plasma ("natural") & experimental Samples

In this shipment, the MPEP continued its evaluation of the experimental samples that were included in the December 2005 shipment.

Overall accuracy with all methods for detecting HIV-1 antibody with experimental positive samples was 97.2% (967/995) vs. 98.0% (958/978) for the same samples in the previous shipment. This difference in accuracy was not statistically significant (p=0.1878).

The overall error rates for all samples (experimental and 'natural' plasma samples) in this shipment over all kit types, excluding Reveal G2, were 1.4% (12/826) and 1.1% (14/1247), respectively, and were not statistically significant (p=0.5490).

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Performance: MPEP plasma ("natural") & experimental Samples (Continued)

In both shipments, there were comments reported by sites using flow-through devices that indicated difficulty with the absorption phase of testing, which resulted in delayed or decreased absorption of MPEP plasma samples. Difficulty with sample absorption may have impacted results by decreasing the relative concentration of sample antibodies available for the detection phase of testing. This would result in an increase in false negative results. Sample absorption issues were most likely a factor in results for the experimental samples in the current survey.

In this shipment, three laboratories using OraQuick missed all samples. Our analysis of the data indicated that these were most likely due to a systematic clerical error in each case. These errors probably do not reflect kit performance. There was no evidence of shipment problems. A sample mix-up would have been an unlikely explanation since there were five positives and only one negative sample in each panel. The overall accuracy for OraQuick if these results are discounted, was 99.6% for this shipment compared with 99.7% in the December 2005 (p=0.5299).

Clerical errors are one of the most common sources of laboratory error and can have critical impact, particularly in HIV testing. Laboratories that missed all samples in this shipment should re-examine their results reporting procedure and their quality assurance practices.

Specimen Types

The number of testing sites reporting the use of oral fluid decreased slightly from 98 responses (20.6%) in the December 2005 shipment to 88 responses (18.2%) in this shipment. Of these, 86 were U.S. testing sites that tended to be either community-based organizations (25/86), or counseling and testing centers (25/86), or health departments (20/86).

In this survey, 46 U.S. testing sites reported using serum and/or frozen plasma as specimen types for the OraQuick ADVANCE HIV-1/2 Antibody test kits. It should be noted that:

- The OraQuick tests are not FDA approved for serum (fresh or frozen) or for frozen plasma specimens.

Use of non-FDA approved specimen types for either of these test kits is considered a modification of the OraQuick testing procedure and makes these non-waived under the Clinical Laboratory Improvement Amendments (CLIA). U.S. facilities should be aware of the CLIA regulations requiring the establishment of performance specifications when modifying an FDA-approved test (Sec. 493.1253).[5]

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Conclusions and Discussion, Continued

Confirmatory Testing

Some U.S. testing sites continue to use confirmatory testing algorithms that do not include Western blot (WB) or indirect immunofluorescence assay (IFA) as recommended by the CDC. U.S. participants are reminded that:

1) HIV rapid tests (RT) are screening tests and reactive results are considered to be "preliminary positives" that must be confirmed by either a WB or IFA test.[1,3]

2) EIA tests for HIV are also considered to be screening, not confirmatory, tests. Some RT reactive specimens confirmed positive by WB or IFA produce negative results using EIAs.

3) CDC Guidelines recommend that preliminary positive (reactive) HIV rapid tests be confirmed with WB or IFA, even if a subsequent EIA test is nonreactive.[3]

Guidelines

Testing sites are advised to follow appropriate guidelines with respect to performing HIV rapid tests and reporting results.[1,2,3] Attention to recognized guidelines and good testing practices is crucial to patient safety and to the delivery of accurate test results.

For example, the CDC has published quality assurance guidelines for testing using the OraQuick rapid test.[1] These guidelines can be applied to other HIV rapid tests performed in U.S. sites.

The guidelines:

- stress that a testing site must have an adequate quality assurance (QA) program in place before offering rapid HIV testing,
- provide recommendations for a comprehensive QA program,
- include recommendations regarding test verification to ensure that the test kits work as expected in a given testing environment,
- encourage participation in an external quality assessment program, such as the MPEP, and address the logistics for providing confirmatory testing for preliminary positive (reactive) results.[1,3]

References

1. Quality Assurance Guidelines for Testing Using the OraQuick Rapid HIV-1 Antibody Test. Centers for Disease Control and Prevention, U.S. Dept. of Health and Human Services. 2003. http://www.cdc.gov/hiv/rapid_testing/materials/QA-Guide.htm

2. CDC. Revised guidelines for HIV counseling, testing, and referral. MMWR 2001; 50(No. RR-19):1-57. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5019a1.htm

3. Notice to Readers: Protocols for Confirmation of Reactive Rapid HIV Tests. MMWR 2004; 53(10): 221-222. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5310a7.htm

4. Notice to Readers: Approval of a New Rapid Test for HIV Antibody. MMWR 2002; 51(46): 1051-1052. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5146a5.htm

5. Code of Federal Regulations: Laboratory Requirements, 42 C.F.R. Chapter IV, Part 493 (2003). http://www.phppo.cdc.gov/clia/regs/toc.aspx

Topical Issues in HIV Rapid Testing

Introduction

The HIV Rapid Testing Model Performance Evaluation Program (HIV-RT MPEP) strives to be a resource for facilities using HIV rapid testing kits. This section of the HIV-RT MPEP Report of Results, "Topical Issues in HIV Rapid Testing," is intended to address that part of our mission. We are including:

- ***Frequently Asked Questions (FAQs)*** by HIV RT MPEP participants to share with all participants our responses to some recent queries,
- ***CDC websites*** to provide participants with access to timely relevant material published online by the CDC, and
- ***HIV Rapid Testing Resources*** as a link to long-term references.

FAQs: June 2006 survey

This section provides answers to some of our participants' frequently asked questions (FAQs).

Q: May we use as QC material the positive and/or negative MPEP samples left over from the panels you send us?

A: No, this is an inappropriate use of MPEP samples.

Our samples are validated only for the purpose of performance evaluation (PE) in HIV rapid testing. While we recognize that extra sample volume (i.e. not used to do the test for the survey shipment) in our panels has been, and will continue to be used effectively for training/practice purposes, the "left-over" sample material is not designed to be used in the very important role of Quality Control (QC) samples.

Appropriate QC material can be purchased from a number of commercial sources.

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Topical Issues in HIV Rapid Testing, Continued

Highlights of previous FAQs

Q: Are we following CDC guidelines when we send out a specimen to a reference lab for the confirmation of a reactive (preliminary positive) HIV rapid test?
A: Before referring specimens, testing sites in the U.S. should confer with the reference laboratory to ensure that either a WB or IFA will be done to confirm all preliminary positive (reactive) HIV rapid test results. CDC emphasizes that reactive rapid HIV tests must be confirmed with either WB or IFA, even if a subsequent EIA is nonreactive.

Q: What types of specimens can be used in performing HIV rapid testing?
A: The type(s) of specimens (e.g. whole blood, serum, plasma, oral fluid, etc.) that are appropriate to use for HIV rapid testing depends on the test kit used. Each manufacturer includes information regarding approved specimen type(s) in the package insert for their HIV rapid testing kit.

Q: Can I read my HIV rapid test results as soon as the control line/spot appears?
A: You need to wait the minimum time as specified in the directions given by the manufacturer (as found in the package insert) before reading the result for a client/patient.

Even if the within-device control line/spot can be seen, positive specimens may need the full minimum time for the color to develop properly. Please note that you should not read results after the specified maximum time limit.

To view other FAQs in previous HIV RT MPEP reports, please visit our website at:
http://www.phppo.cdc.gov/mpep/HIV-1rt.aspx

CDC websites

Quick Facts: Rapid Testing April 2003 - April 2004
http://www.cdc.gov/hiv/rapid_testing/materials/QuickFact_April2004.htm

MMWR: Notice to Readers: Protocols for Confirmation of Reactive Rapid HIV Tests
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5310a7.htm

Quality Assurance Guidelines for Testing Using the OraQuick® Rapid HIV-1 Antibody Test
http://www.cdc.gov/hiv/rapid_testing/materials/QA-Guide.htm

International Laboratory-related Resource and Activity Directory
http://www.phppo.cdc.gov/dls/ila/default.aspx

MMWR: Good Laboratory Practices for Waived Testing Sites
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5413a1.htm

HIV rapid testing resources

HIV Rapid Testing MPEP website: http://www.phppo.cdc.gov/mpep/HIV-1rt.aspx

Model Performance Evaluation Program (MPEP) Home page: http://www.phppo.cdc.gov/mpep/

Food and Drug Administration (FDA) Licensed / Approved HIV, HTLV and Hepatitis Tests
http://www.fda.gov/cber/products/testkits.htm

The National Center for HIV, STD, and TB Prevention (NCHSTP)
Divisions of HIV/AIDS Prevention (DHAP) website: http://www.cdc.gov/hiv/dhap.htm

The National Center for HIV, STD, and TB Prevention (NCHSTP) Home page
http://www.cdc.gov/nchstp/od/nchstp.html

The World Health Organization: http://www.who.int/en/