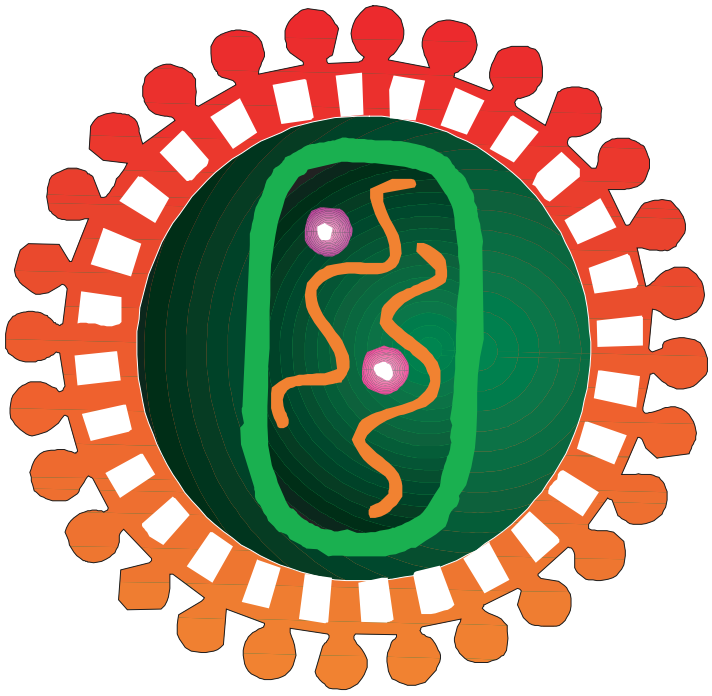
MPEP

HIV Rapid Testing

Report of Sample Shipment Results, December 2005



DEPARTMENT OF HEALTH & HUMAN SERVICES

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

HIV-1 Rapid Testing MPEP December 2005 Report of Results

Report of the December 2005 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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Donor Report

Table 1: HIV Rapid Testing MPEP December 2005

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	18*	Positive (S)	Infected	_____	_____
	A2	14	Positive (S)	Infected	_____	_____
	A3	5	Negative	Uninfected	_____	_____
	A4	10	Positive (W)	Infected	_____	_____
	A5	16	Positive (W)	Infected	_____	_____
	A6	19*	Positive (W)	Infected	_____	_____
B	B1	19	Positive (W)	Infected	_____	_____
	B2	10	Positive (W)	Infected	_____	_____
	B3	14	Positive (S)	Infected	_____	_____
	B4	18	Positive (S)	Infected	_____	_____
	B5	5	Negative	Uninfected	_____	_____
	B6	16	Positive (W)	Infected	_____	_____
C	C1	5	Negative	Uninfected	_____	_____
	C2	18	Positive (S)	Infected	_____	_____
	C3	16	Positive (W)	Infected	_____	_____
	C4	14	Positive (S)	Infected	_____	_____
	C5	19	Positive (W)	Infected	_____	_____
	C6	10	Positive (W)	Infected	_____	_____
D	D1	19	Positive (W)	Infected	_____	_____
	D2	14	Positive (S)	Infected	_____	_____
	D3	10	Positive (W)	Infected	_____	_____
	D4	16	Positive (W)	Infected	_____	_____
	D5	18	Positive (S)	Infected	_____	_____
	D6	5	Negative	Uninfected	_____	_____

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

[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 colorimetric test results for reactive samples.

Report of Results: Overview

Purpose

This report describes the results of the seventh 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 first time, experimental samples designed for long-term stability at ambient temperature were included for evaluation. These samples may have potential for use in proficiency testing and quality control where access to refrigeration is limited.

The six survey samples included these two positive 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 537 testing sites within and outside of the United States. Responses were received from 475 (88.5%) of the testing sites. Of those responding:

- 410 (86.3%) were U.S. testing sites, and
- 65 (13.7%) were non-U.S. testing sites.

Note:
Sixteen testing sites submitted multiple result forms, indicating the use of from one to six different test kits, so that the total number of responses was 493.

Overall Performance

Overall accuracy (percent of correct results) for all samples, by all sites with all kit types, was 99.1% (2897/2924). "Indeterminate" result interpretations were considered to be incorrect, and "Invalid" result interpretations were not included in the analyses. (Eleven invalid results were reported by nine testing sites. These tended to be related to the use of flow-through testing 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)
Frozen Plasma Samples		472	1946	1460	2 (0.1%)	2 (0.1%)	479		3 (0.6%)	99.6%
Experimental Samples	All Test Kits	472	978	958		20** (2.0%)	n/a	n/a	n/a	98.0%
	**All Test Kits EXCEPT Reveal G2	379	791	788		3 (0.4%)	n/a	n/a	n/a	99.6%

* Ind = Indeterminate
** Note: 17/20 false negatives were reported by labs using MedMira Reveal G2 Rapid HIV-1 Antibody Test

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Report of Results: Overview, Continued

MPEP plasma samples, summary results

- The routine MPEP plasma **positive challenges** included one strong positive sample (Donor 14) and two weak positives (Donors 10 and 16).
  - Four incorrect results were reported for the weak positive sample (Donor 16)
  - Overall Accuracy for MPEP plasma positive samples was 99.7% (1460/1464).
  - Accuracy varied with test kit used (94.4% - 100%).
  - The two false negative and two indeterminate results reported for the MPEP plasma samples appeared to be random.
- Three incorrect results were reported on the **negative challenge** (Donor 5).
  - Overall Accuracy was 99.4% (479/482).
  - Incorrect results appeared to be random.

Experimental samples, summary results

- The experimental **positive challenges** included one strong positive sample (Donor 18) and one weak positive sample (Donor 19).
  - Twenty incorrect results were reported on these experimental samples
    - 7 for the strong positive sample (Donor 18) and
    - 13 for the weak positive sample (Donor 19).
  - Most of the false negative results for the experimental samples were reported by laboratories using the MedMira Reveal G2 Rapid HIV-1 Antibody Test (17/20):
    - 12/13 of those were for weak positive experimental sample, Donor 19, and
    - 5/7 of those were for strong positive experimental sample, Donor 18.
  - Accuracy varied with test kit used (90.9 – 100%).
    - Accuracy for experimental samples for all kits except MedMira Reveal G2 was 97.1% - 100%.
  - Overall accuracy for experimental samples was 98.0% (958/978).
    - Overall accuracy for experimental samples for all kits except MedMira Reveal G2 was 99.6% (788/791).

Continued on next page

Report of Results: Overview, Continued

Changes in Specimen Type

- **Oral fluid (oral mucosal transudate) as a specimen type:**
  - was reported used by 98 sites,
  - increased in usage from 58 sites reported to MPEP in June 2005,
  - was used primarily in the U.S. (96/98, 98.0%)
    - by sites identified as community-based organizations (31/96, 32.3%), counseling and testing centers (26/96, 27.1%), or health departments (22/96, 22.9%)
    - for the OraQuick Advance Rapid HIV-1/2 test kit (95/96, 99.0%).
- 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. This means appropriate CLIA standards must be met.
  - 39 used either serum or frozen plasma samples with OraQuick Rapid HIV-1 or OraQuick Advance HIV-1/2 Antibody test kits.
  - one used oral fluid with the OraQuick Rapid HIV-1 Antibody test kit.

Confirmatory testing practices

Twenty 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 December 2005.

The six samples for this shipment were:

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

- two experimental samples:
  - one strong HIV-1 antibody positive, and
  - one weak positive.

Description of challenge samples

All "natural" frozen 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 resulting plasma for all samples was tested to determine HIV-1 antibody reactivity.

The samples for the December 2005 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 selected using the following criteria:
  - reactive by the Genetic Systems rLAV enzyme immunoassay (EIA) kit at a signal-to-cutoff ratio between 3 and 5 for the seroconverter samples and greater than 5 for the strong positive samples, and

  - positive by the APHL/CDC interpretive criteria for Western blot (WB) patterns.

Demographics

Overview

A total number of 475 different testing sites (foreign and domestic) submitted results. Of these:

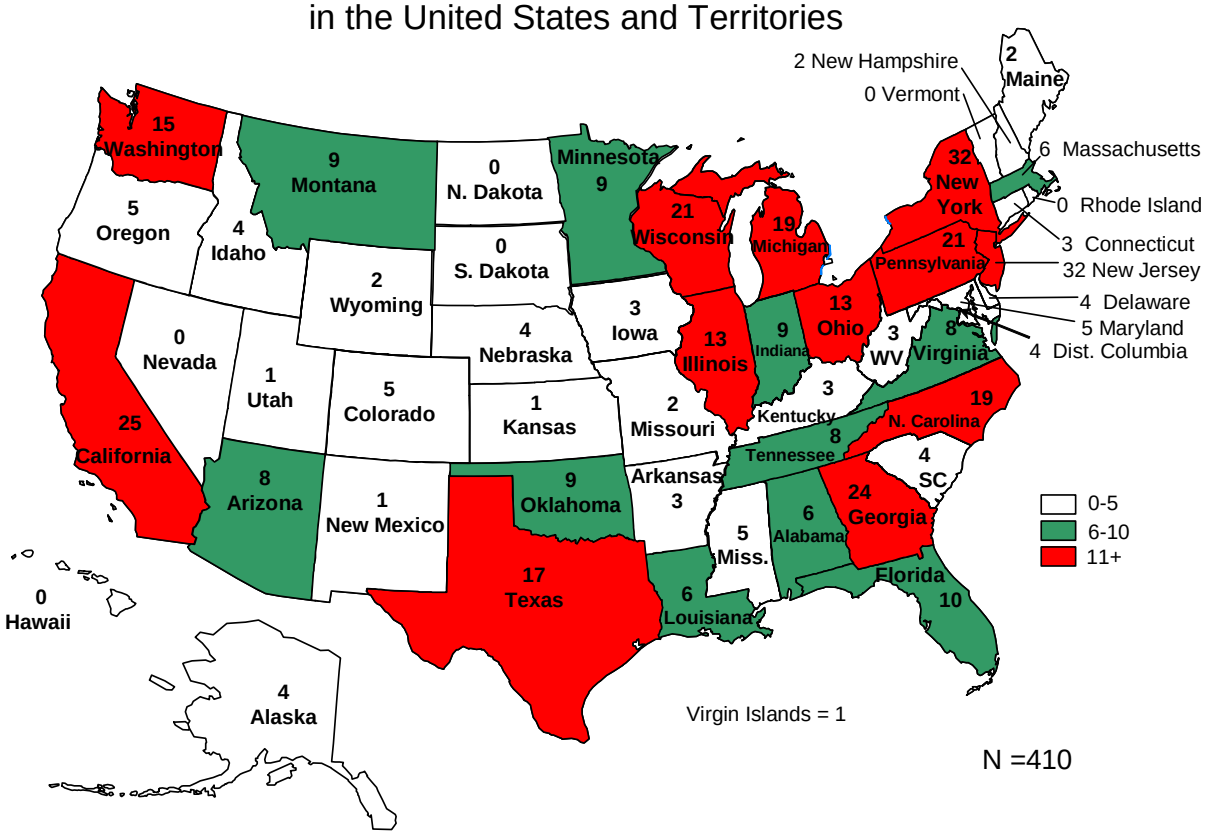
- the 410 domestic testing sites are depicted in ***Figure 1***, and
- the 65 foreign testing sites are listed in ***Table 3***.

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

- The number of foreign participants in the current survey (65) was similar to the previous survey (June 2005, n = 68).
- 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 (410) was greater by ~5% than that of the previous survey (391).
- In the U.S., hospital testing sites predominated.

Figure 1

Number of MPEP HIV Rapid Testing Laboratories Returning Results in the United States and Territories



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Demographics, Continued

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

Table 3

Country	Number	Country	Number
Australia	1	India	3
Bahamas	1	Indonesia	1
Bangladesh	1	Kenya	1
Belgium	1	Malawi	1
Botswana	4	Malaysia	1
Brazil	1	Mali	1
Burkina Faso	2	Nepal	1
Cameroon	2	Niger	1
Canada	1	Nigeria	2
Central African Republic	1	Panama	1
Columbia	1	Philippines	3
Congo	1	Republic of Yemen	1
Cote d'Ivoire	1	Senegal	1
Dominican Republic	1	Slovakia	1
Egypt	1	South Korea	1
El Salvador	1	Suriname	1
Eritrea	1	Taiwan	1
Ethiopia	1	Tanzania	6
Germany	1	Thailand	6
Guyana	1	Uganda	1
Honduras	1	Zambia	1
Hungary	1	Zimbabwe	2

N = 65

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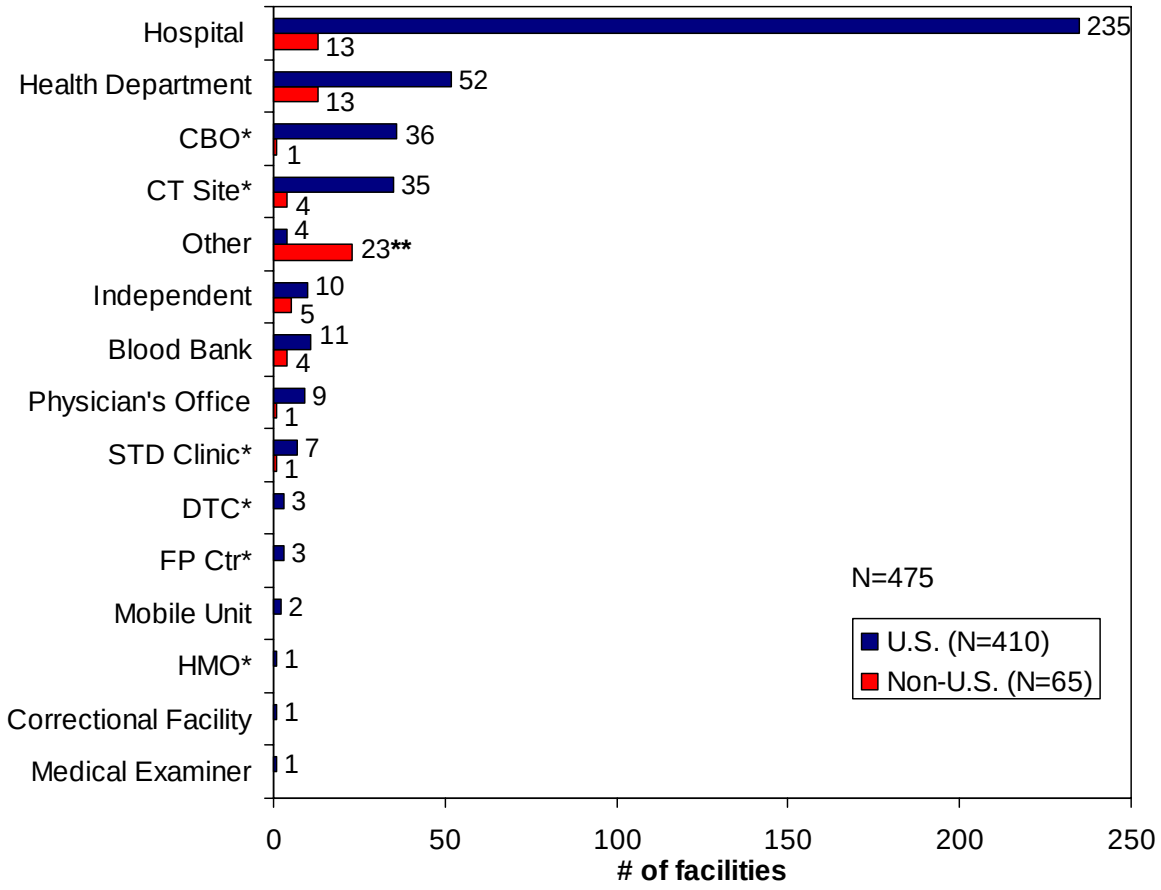
Demographics, Continued

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

(**) 15/23 were laboratories or medical units associated with U.S. embassies.

Detailed Performance Results

Table 4 gives the results by donor for the percent of reactive/positive reported results for MPEP plasma samples positive Donors 10, 14 & 16, experimental positive samples, Donors 18 & 19 and the percent of non-reactive/negative reported results for Donor 5 (the negative donor).

	Reactivity					
Donor Number	**# of Participants**	**# of Results**	**# Pos.**	**# Neg.**	**# Indeter**	**% Correct**
5 (Negative)	472	482	3	479	0	99.4%
10 (Weak Pos)	472	489	489	0	0	100.0%
14 (Strong Pos)	471	489	489	0	0	100.0%
16 (Weak Pos)	472	486	482	2	2	99.2%
18 (Exp* Strong Pos)	472	488	481	7	0	98.6%
19 (Exp* Weak Pos)	472	490	477	13	0	97.3%

*Experimental

MPEP plasma samples, detailed performance results

- MPEP plasma samples: Negative Sample (Donor 5):
  - The three false positive results were reported by two U.S. & one non-U.S. site.
- MPEP plasma samples: Positive Samples:
  - All four errors were reported for weak positive Donor 16.
  - There were two false negatives reported by two U.S. sites.
  - There were two indeterminate results reported by one U.S. & one non-U.S. site.

Experimental samples, detailed performance results

- Experimental: Positive Samples:
  - All 20 false-negative errors on experimental samples were reported by U.S. testing sites (17/20 of these errors were made by laboratories using MedMira Reveal G2).
  - 13/20 false-negative errors were reported for the weak-positive sample (donor 19).
  - 7/20 false-negative errors were reported for the strong-positive sample (donor 18).

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

Table 5a: Results for MPEP plasma 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	Total # of Results	# Correct	% Correct
Oraquick ADVANCE Rapid HIV-1/2 Ab Test (OraSure)	249	750	749	1		99.9%	249	249	1	248		99.6%	999	997	99.8%
OraQuick Rapid HIV-1 Ab (OraSure)	17	51	51			100.0%	17	17	1	16		94.1%	68	67	98.5%
Reveal G2 Rapid HIV-1 Antibody Test (MedMira)	93	277	276	1		99.6%	88	89		89		100.0%	366	365	99.7%
Reveal Rapid HIV-1 Test (MedMira)	3	9	9			100.0%	3	3		3		100.0%	12	12	100.0%
Determine HIV-1/2 (Abbott)	36	108	107		1	99.1%	36	36		36		100.0%	144	143	99.3%
Biotech Uni-Gold Recombigen HIV (Trinity)	39	116	116			100.0%	39	39		39		100.0%	155	155	100.0%
Biotech Uni-Gold (Trinity)	12	36	36			100.0%	12	12		12		100.0%	48	48	100.0%
Biotech Capillus (Trinity)	9	27	27			100.0%	9	8		8		100.0%	35	35	100.0%
Multispot HIV-1/HIV-2 (Bio-Rad)	6	18	17		1	94.4%	6	6		6		100.0%	24	23	95.8%
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%
Serodia HIV (Fujirebio)	3	9	9			100.0%	3	3		3		100.0%	12	12	100.0%
Other	16	48	48			100.0%	16	15	1	14		93.3%	63	62	98.4%

Table 5b gives the accuracy by kit type for experimental 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	Total # of Results	# Correct	% Correct
Oraquick ADVANCE Rapid HIV-1/2 Ab Test (OraSure)	249	499	497	2		99.6%	n/a	n/a	n/a	n/a	n/a	n/a	499	497	99.6%
OraQuick Rapid HIV-1 Ab (OraSure)	17	34	33	1		97.1%	n/a	n/a	n/a	n/a	n/a	n/a	34	33	97.1%
Reveal G2 Rapid HIV-1 Antibody Test (MedMira)	93	187	170	17		90.9%	n/a	n/a	n/a	n/a	n/a	n/a	187	170	90.9%
Reveal Rapid HIV-1 Test (MedMira)	3	6	6			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	6	6	100.0%
Determine HIV-1/2 (Abbott)	36	72	72			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	72	72	100.0%
Biotech Uni-Gold Recombigen HIV (Trinity)	39	78	78			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	78	78	100.0%
Biotech Uni-Gold (Trinity)	12	24	24			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	24	24	100.0%
Biotech Capillus (Trinity)	9	18	18			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	18	18	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	6			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	6	6	100.0%
Serodia HIV (Fujirebio)	3	6	6			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	6	6	100.0%
Other	16	32	32			100.0%	n/a	n/a	n/a	n/a	n/a	n/a	32	32	100.0%

Kit Types Used By Participants

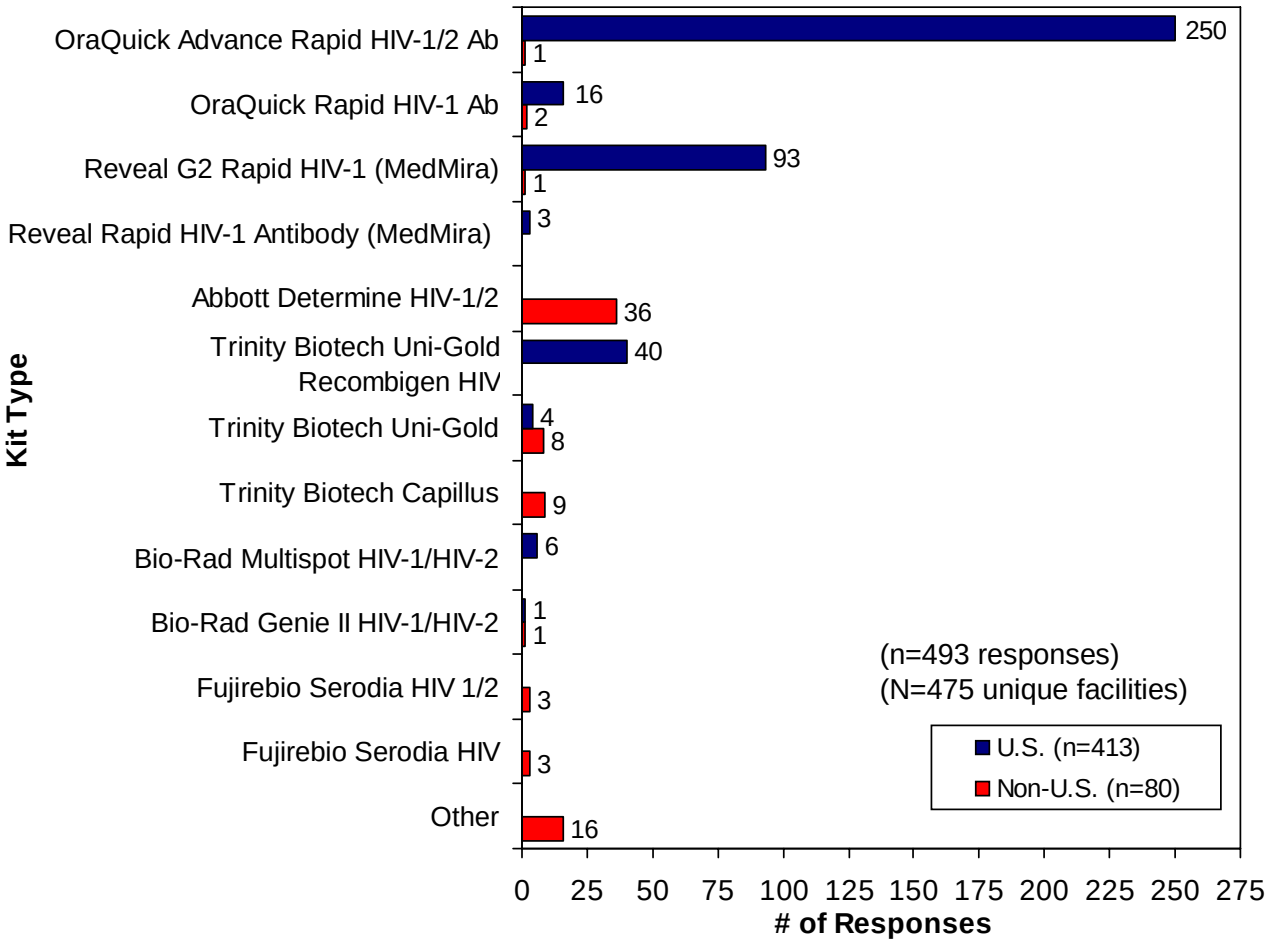
Overview

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 (60.5%; 250/413), as shown in ***Figure 3***:
- The predominant kit type used in non-U.S. testing sites was Abbott Determine HIV-1/2 (45.0%; 36/80).
- 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.

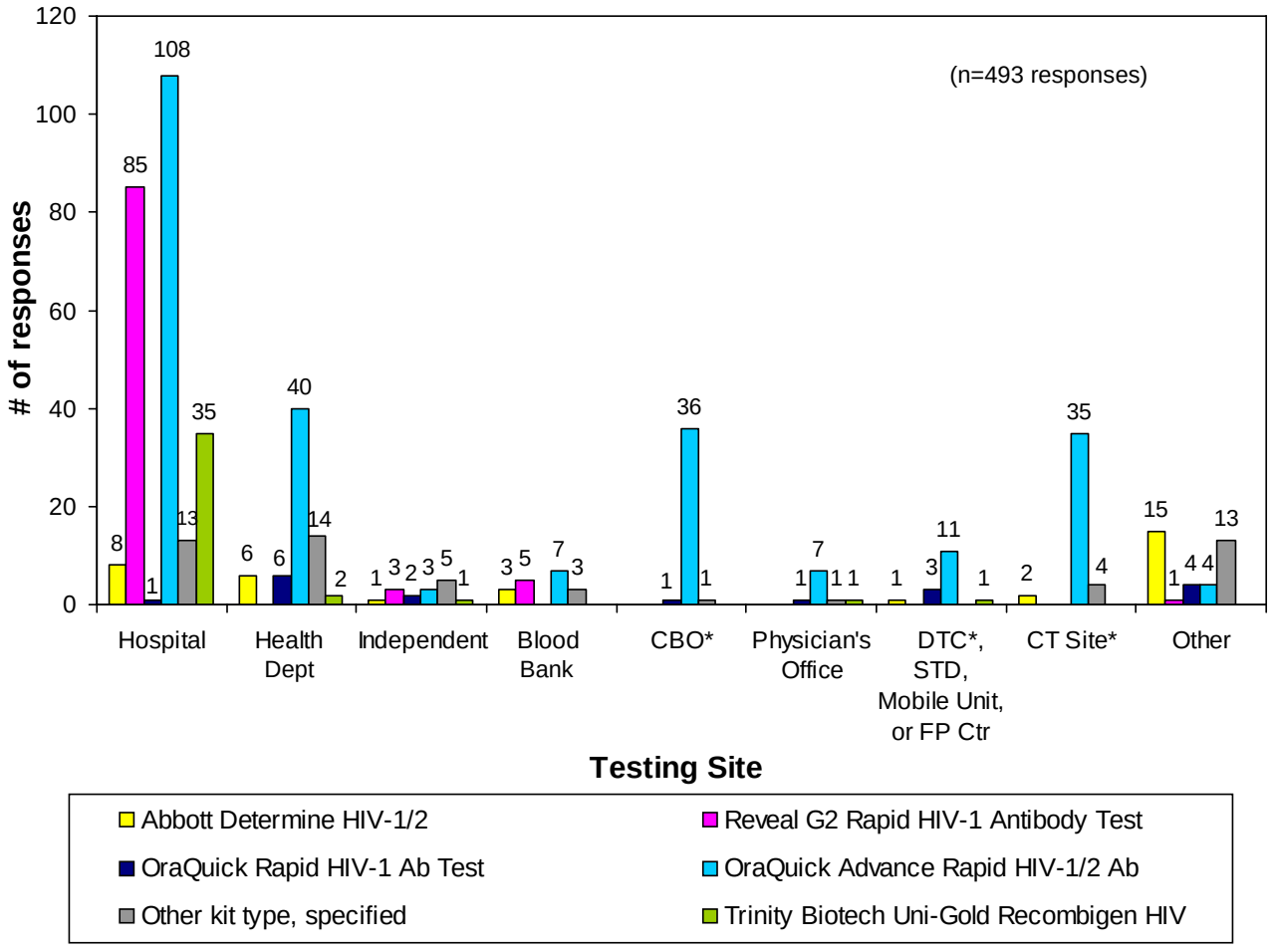
The predominate test kit used was OraQuick ADVANCE Rapid HIV 1/2 Ab Test. The percent of sites using this kit, by type of facility, is as follows:

- hospitals, 43.2%
- health departments, 58.8%
- blood banks, 38.9%
- CBOs*, 94.7%
- physician offices, 70.0%
- outreach sites (DTCs, STD clinics, CT sites, FP Ctrs, mobile units)*, 80.7%

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

Specimen Types Used By Participants

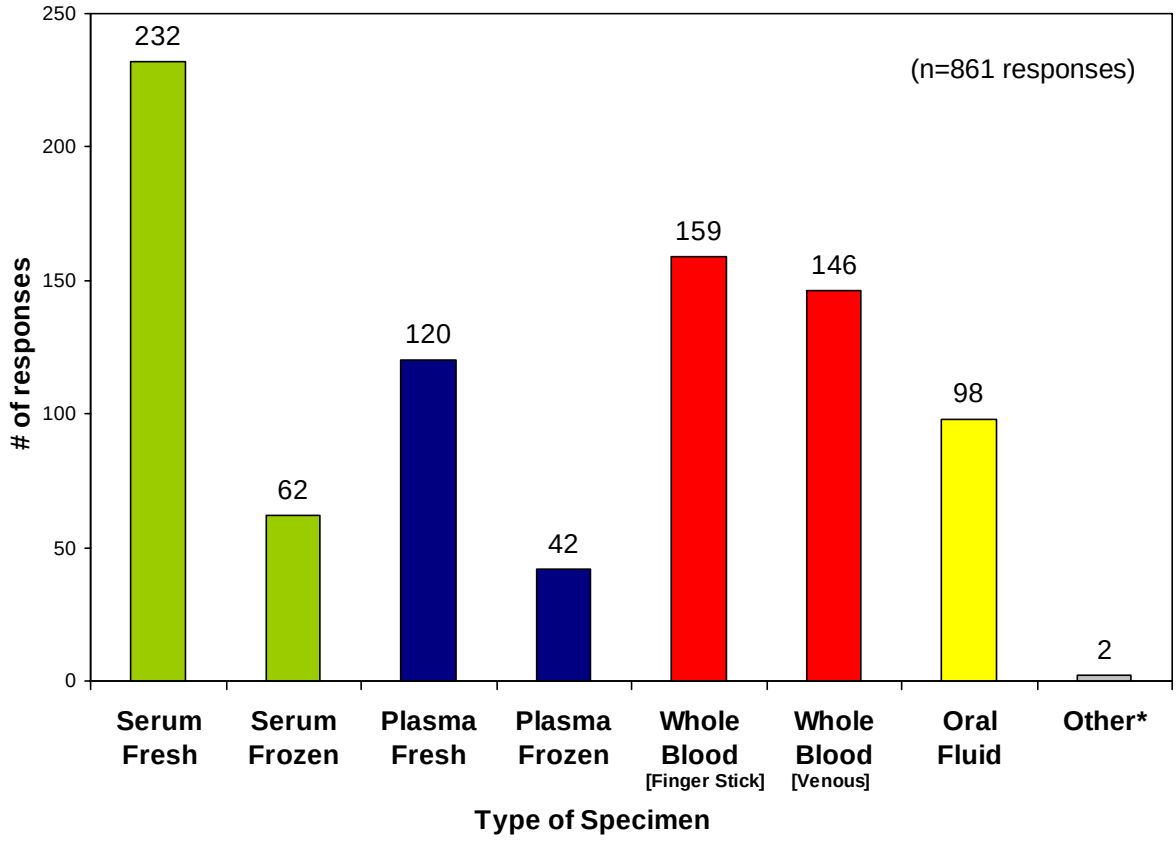
Overview

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 second "Other" specimen type was not specified.

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 increased, with respect to the previous survey, from 58 to 98. This increase reflects the availability of the new OraQuick ADVANCE Rapid HIV- 1/2 Ab test kit which is FDA approved and CLIA waived for both oral fluid and whole blood.

Quality Control (QC)

Overview

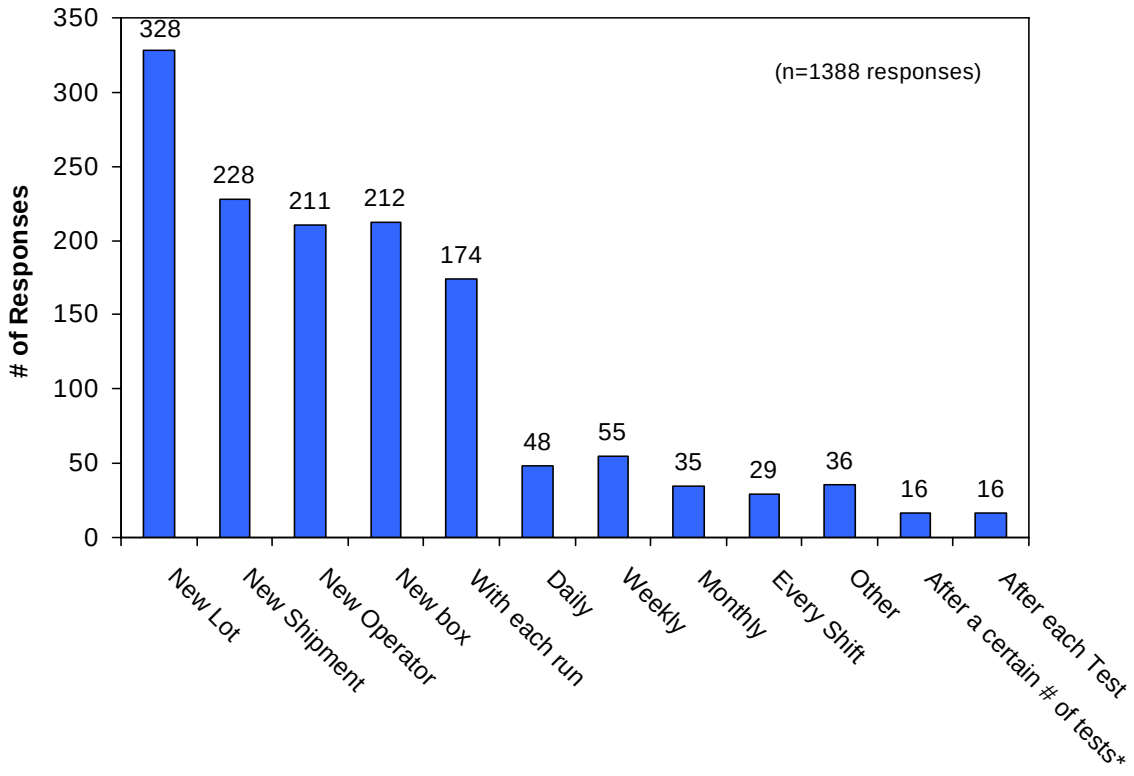
Testing sites were asked if they used quality control (QC) samples, either positive or negative, when performing HIV rapid tests. The frequency of use of quality control materials is shown in ***Figure 6***.

- Of the 475 facilities that returned responses, 472 (99.4%) answered the question regarding use of quality control samples (question #5).
- Most of these facilities (94.3%, 445/472) indicated the use of QC samples for at least one of the kit types they use at their testing site.
- Of the 1230 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 (86.8%, 1068/1230),
    - 40.4% (432/1068) were included in the test kit, and
    - 59.6% (636/1068) were purchased from the kit manufacturer separately.
  - in-house controls (8.6%, 106/1230).
  - "Other" manufacturer (manufacturer not the same as for the test kit) controls (4.6%, 56/1230).

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 21-50)

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 (431/766; 56.3%) indicated that reactive (preliminary positive) specimens were sent to another facility.
- In several cases, EIA was performed alone (28/766; 3.7%) or in combination with other testing (176/766; 23.0%).
- Many responses (121/766; 15.8%) indicated using a second rapid test for confirmatory testing. Of these, 18/121 (14.9%) indicated using a second rapid test with no other type of confirmatory testing.

Twenty-eight 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.

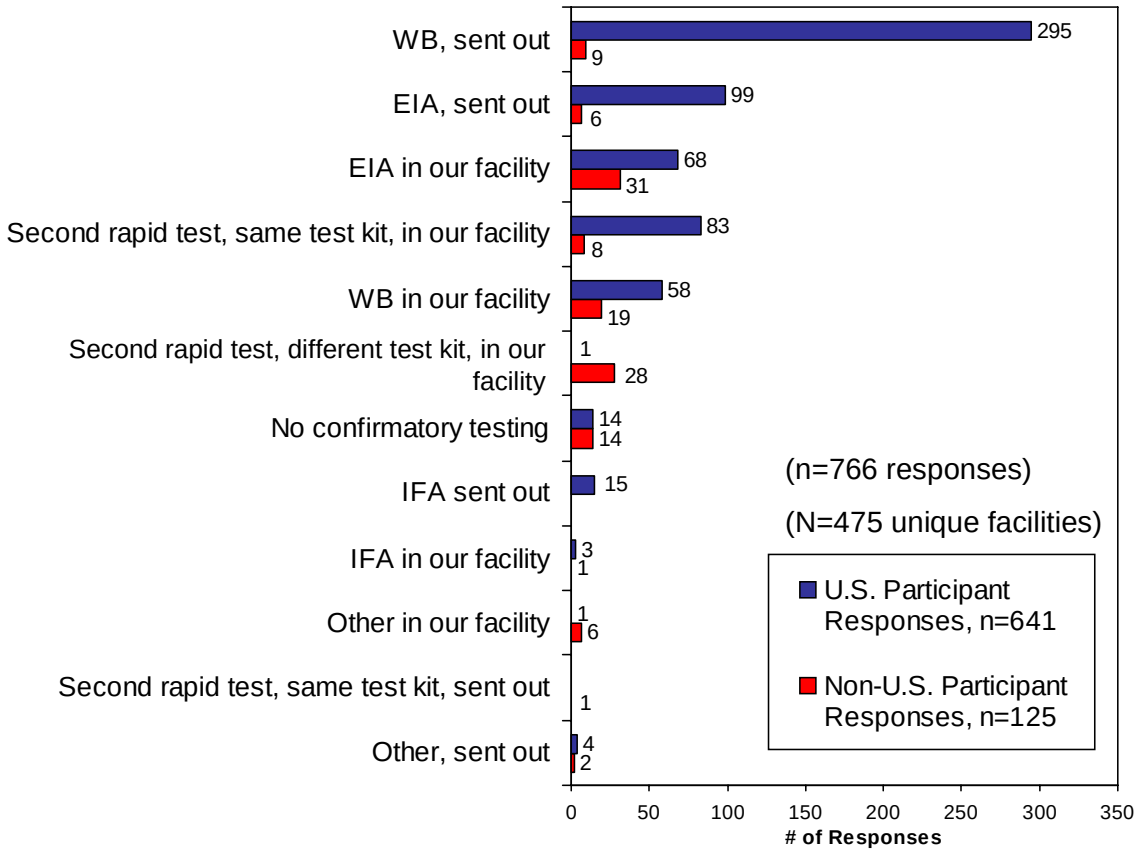
Twenty-five of these 28 responses were reported by sites not using confirmatory testing for ***any*** kit type:

- Thirteen were from U.S. sites.
- Twelve were from non-U.S. sites

The circumstances surrounding the use of HIV rapid tests without confirmatory testing are unclear.

Figure 7:

Types of confirmatory testing



Conclusions and Discussion

Overall performance

Testing sites performed well in this MPEP shipment survey (99.1% correct results). Overall accuracy for:

- all positive samples was 99.0%, and
- the negative sample was (99.4%).

The 24 incorrect results reported for positive samples varied with the type of sample (MPEP plasma vs. experimental), depending on the HIV rapid testing kit used.

- o 4 frozen plasma
- o 20 experimental

The three incorrect results reported for negative samples were apparently random.

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

In this shipment, the MPEP is evaluating a material (experimental samples) that may be able to be used for quality control or proficiency testing and stored at room temperature, thus eliminating the need for refrigeration.

Overall accuracy with all methods for detecting HIV-1 antibody with experimental samples was 98.0% (958/978) vs. 99.7% (1460/1464) for "natural" MPEP plasma samples. Most incorrect results with experimental samples were associated with the weak positive sample (12/20) by testing sites using a kit based on flow-through technology (10/12). When results obtained from participants using this kit (MedMira Reveal G2 Rapid HIV-1 Antibody test) were excluded, testing accuracy was the same ($p = 0.1530$) for positive experimental samples [99.6% (788/791)] compared with "natural" plasma samples [99.7% (1184/1187)].

These observations may reflect some adverse matrix effects for the weak positive experimental samples when tested using flow-through devices. However, in previous MPEP performance evaluation surveys there have been more incorrect or invalid results reported for weak positive samples by sites that used flow-through devices than for sites that used other testing methodologies (http://www.phppo.cdc.gov/mpep/HIV-1rt.aspx). In these surveys, comments reported by sites using flow-through devices have 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, especially for weak positive samples. Sample absorption issues could also have been a factor in results for the experimental samples in the current survey.

The current results were obtained using experimental samples stored and shipped under the same conditions as the "natural" MPEP plasma samples. Further MPEP work will focus on comparing results using experimental samples held at room temperature for three months prior to shipment. Commercially-stabilized samples may prove to be an important alternative to plasma samples or other materials that must be refrigerated for quality control and proficiency testing.

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Specimen types

The number of testing sites reporting the use of oral fluid increased from 58 to 98 responses. Of these, 96 were U.S. testing sites that tended to be community-based organizations (31/96), counseling and testing centers (26/96), or health departments (22/96). The change in specimen types used reflects the availability of the new OraQuick ADVANCE Rapid HIV-1/2 Ab test which is FDA approved for oral fluid.

In this survey, 35 U.S. testing sites reported using serum and/or frozen plasma as specimen types for the OraQuick Rapid HIV-1 or ADVANCE HIV-1/2 Antibody test kits. In addition, one U.S. testing site and 2 non-U.S. testing sites indicated the use of oral fluid for the OraQuick Rapid HIV-1 test. It should be noted that:

- The OraQuick tests are not FDA approved for serum (fresh or frozen) or for frozen plasma specimens.
- The OraQuick ADVANCE Rapid HIV-1/2 Ab test is FDA approved for both oral fluid and whole blood, but the OraQuick Rapid HIV-1 test is not FDA approved for oral fluid use.

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]

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]

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Conclusions and Discussion, Continued

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: December 2005 survey

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

Q: We accidentally tested the wrong HIV Rapid Testing MPEP panel for this survey. Can we still use the results?

A: No.

Determination of correct/incorrect results for each sample survey is based on the results for assigned panels for each participant, and using any other panel is an error.

An essential part of quality assurance (QA) in laboratory testing is to make sure the results reported match the appropriate sample. Testing sites should have processes and procedures in place to prevent specimen mix-ups. MPEP performance evaluation (PE) samples should be handled in the same fashion as that of patient/client samples, including attention to labeling and recording of results.

For more information on proper specimen labeling and other good laboratory testing practices, please see *Good Laboratory Practices for Waived Testing Sites*, [MMWR 54(RR13):1-25] at: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5413a1.htm

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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/