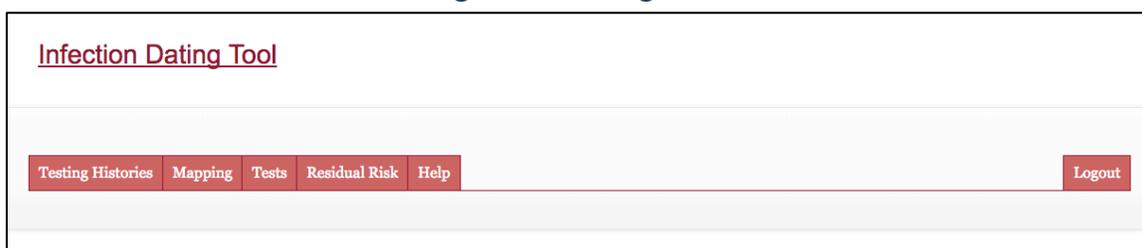


Appendix B: Infection Dating Tool Web Interface

Supplementary material to Grebe E, Facente SN, Bingham J, Pilcher CD, Powrie A, Gerber J, Priede G, Chibawara T, Busch MP, Murphy G, Kassanjee R, Welte A. *Interpreting HIV Diagnostic Histories into Infection Time Estimates: Analytical Framework and Online Tool*.

Once logged in, the system presents users with four primary pages, accessible via links spread in horizontal tabs below the header, as shown in Figure 1. The first three are described in turn below, with the fourth the subject of a separate publication (Welte, et al., forthcoming).

Figure B.1: Navigation^a



^aThe logic and diagnostic test performance data required for infection dating has significant overlap with that required to calculate the residual risk of infectious material being missed by screening algorithms applied to blood products. Therefore, the online tool has a residual risk calculator built into it as well. This aspect of the tool is discussed and presented in a separate article (Welte et al., forthcoming).

Testing Histories

This tab (Figure 2) allows users to locate, view and delete previously uploaded 'testing histories', and to upload new ones. It is also where users trigger the action of processing the uploaded testing histories into 'infection dating estimates', which can then be viewed and downloaded.

Figure B.2: Testing Histories

The screenshot shows the "Testing Histories" page. At the top, there is a navigation bar with tabs for "Testing Histories", "Mapping", "Tests", "Residual Risk", and "Help", and a "Logout" button on the right. Below the navigation bar, there is a "Data file:" section with a "Choose file" button and "No file chosen" text, and an "Upload" button. Below this is a table with the following columns: "Name", "Date Uploaded", "File State", "Mapping", "Process", "View Results", and "Purge".

Name	Date Uploaded	File State	Mapping	Process	View Results	Purge
ExampleData2_cPC35L4	Nov. 20, 2018, 7:53 p.m.	processed	Mapping	Process	View Results	Purge
ExampleData2	Nov. 20, 2018, 7:47 p.m.	processed	Mapping	Process	View Results	Purge
ExampleData_OxvKVad	Nov. 15, 2018, 7:24 p.m.	processed	Mapping	Process	View Results	Purge
ExampleData_6u9HiQD	Nov. 15, 2018, 7:11 p.m.	processed	Mapping	Process	View Results	Purge
Rakai_R15_TestHist	May 17, 2018, 9:44 a.m.	processed	Mapping	Process	View Results	Purge
SABES_HIV_Testing_WjiCQtz	April 20, 2018, 11:40 a.m.	needs_mapping	Mapping			Purge
JHU_testhistory_UECISbG	Jan. 24, 2018, 3:31 p.m.	processed	Mapping	Process	View Results	Purge

Mapping

This tab (Figure 3) allows users to link strings (alphanumeric codes) in their data files to tests in the online database, hence linking records in uploaded files to the applicable diagnostic delays.

Figure B.3: Mapping

Testing Histories Mapping Tests Residual Risk Help Logout

Mapping for ExampleData_Vfz1S9H
Please complete any maps without all three values

Code	Test	Property	
WesternBlotFull	BioRad GS HIV-1 Western blot Fully Reactive	CEPHIA Estimate	Edit
PoCRT	Trinity Biotech Unigold Rapid HIV Test	CEPHIA Estimate	Edit
WesternBlotIndet	BioRad GS HIV-1 Western blot Indeterminate	CEPHIA Estimate	Edit
QualitativeVL	Aptima HIV-1 RNA Qualitative Assay	CEPHIA Estimate	Edit

Mapping completed

Validate Mapping Return to data files

Tests

This tab (Figure B.4a) allows users to view the existing database of diagnostic tests, and to add new ones if necessary. Note that each user sees only the shared developer-maintained list of tests, plus his/her own – not those added by other users. This page further allows the user to select between computing EP-DDI and LP-DDI using naïve diagnostic delay medians, or to utilise the σ parameter and a specified value of α to compute credibility intervals (see Figures B.4b and B.4c).

Figure B.4a: Tests

Calculation parameters: *EP- & LP-DDI will represent 95% Credibility Intervals*

Your tests

Add a new test

Name	Category	
AmplicorIndDBS1000	Viral Load	Edit
Ampliscreen pool of 5	Viral Load	Edit
BioMerieux Vitek WB Fully Reactive	Western blot	Edit
BioMerieux Vitek WB Indeterminate	Western blot	Edit
Generic Viral Load DT42	Viral Load	Edit
ID-NAT ULTRIO	Viral Load	Edit
MP-NAT (pool of 16, LoD50 of 1.7)	Viral Load	Edit
MP-NAT (pool of 8, LoD50 of 1.7)	Viral Load	Edit
PooledNATDT100x5 (effective 500)	Viral Load	Edit
SANBS NAT	Viral Load	Edit

Global tests

Western blot

BioRad GS HIV-1 Western blot Fully Reactive	Edit
BioRad GS HIV-1 Western blot Indeterminate	Edit

1st Gen Lab Assay (Viral Lysate IgG sensitive Antibody)

Murex ICE HIV-1.O.2 EIA	Edit
Unspecified 1st Gen Lab Assay	Edit

Figure B.4b: Naïve estimates using median diagnostic delays

Calculation parameters: *EP- & LP-DDI will be based on Median diagnostic delays*

Viral load growth rate estimate

Fiebig et al. (AIDS 2003): 0.35 log₁₀ copies/ml/day

Calculate DDI bounds:

[Reset to defaults](#) [Submit](#)

Figure B.4c: Computing credibility intervals

Calculation parameters: EP- & LP-DDI will represent 95% Credibility Intervals

Viral load growth rate estimate

Fiebig et al. (AIDS 2003): 0.35 log₁₀ copies/ml/day

Calculate DDI bounds: Significance level (alpha) for credibility intervals

[Reset to defaults](#) [Submit](#)

Results

Processing can be triggered after test codes have been mapped to specific assays in the database. If test property estimates other than the default are preferred, these can be selected on the mapping screen prior to processing. Each file that has been uploaded on the “Testing Histories” tab has a “Mapping” link, and once mapping has been completed, a “Process” link appears. After processing, results can be viewed and downloaded on a per-file basis. Figure B.5a shows EP-DDI and LP-DDI based on median diagnostic delays, and Figure B.5b shows 95% credibility intervals.

Figure B.5a: Results

Testing Histories Mapping Tests Residual Risk Help [Logout](#)

These are your results for: ExampleData2_cPC35L4 [Download Results](#)

Subject	EP DDI	LP DDI	DDI Interval	EDDI	Flags
Subject A	Dec. 16, 2016	Jan. 6, 2017	21	Dec. 26, 2016	All tests reported are on same date EP-DDI & LP-DDI based on median diagnostic delays Subject has a discordant test date
Subject B	Aug. 19, 2016	Jan. 6, 2017	140	Oct. 28, 2016	EP-DDI & LP-DDI based on median diagnostic delays
Subject C	Aug. 28, 2014	Sept. 4, 2014	7	Aug. 31, 2014	EP-DDI & LP-DDI based on median diagnostic delays Subject has a discordant test date EPDDI and LPDDI less than 10 days apart

Figure B.5b: Results (95% CIs)

Testing Histories Mapping Tests Residual Risk Help [Logout](#)

These are your results for: ExampleData2_cPC35L4 [Download Results](#)

Subject	EP DDI	LP DDI	DDI Interval	EDDI	Flags
Subject A	Dec. 11, 2016	Jan. 5, 2017	25	Dec. 23, 2016	All tests reported are on same date EP-DDI & LP-DDI represent 95% Credibility Interval Subject has a discordant test date
Subject B	Aug. 21, 2016	Jan. 3, 2017	135	Oct. 27, 2016	EP-DDI & LP-DDI represent 95% Credibility Interval
Subject C	Aug. 24, 2014	Sept. 5, 2014	12	Aug. 30, 2014	EP-DDI & LP-DDI represent 95% Credibility Interval Subject has a discordant test date