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*A Fuzzy Logic Framework
for Integrating Multiple Learned Models*

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Bobi Kai Den Hartog

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A FUZZY LOGIC FRAMEWORK FOR INTEGRATING MULTIPLE LEARNED MODELS

Bobi Kai Den Hartog

ABSTRACT

The Artificial Intelligence field of *Integrating Multiple Learned Models (IMLM)* explores ways to combine results from sets of trained programs.

Aroclor Interpretation is an ill-conditioned problem in which trained programs must operate in *scenarios* outside their training ranges because it is intractable to train them completely. Consequently, they fail in ways related to the scenarios.

We developed a general-purpose IMLM solution, the *Combiner*, and applied it to Aroclor Interpretation. The Combiner's first step, *Scenario Identification (SI)*, learns rules from very sparse, synthetic training data consisting of results from a suite of trained programs called *Methods*. SI produces fuzzy belief weights for each scenario by approximately matching the rules. The Combiner's second step, *Aroclor Presence Detection (AP)*, classifies each of three Aroclors as *present* or *absent* in a sample. The third step, *Aroclor Quantification (AQ)*, produces quantitative values for the concentration of each Aroclor in a sample. AP and AQ use automatically learned empirical biases for each of the Methods in each scenario. Through fuzzy logic, AP and AQ combine scenario weights, automatically learned biases for each of the Methods in each scenario, and Methods' results to determine results for a sample.

The Combiner is a general purpose IMLM solution. Its unique scenario-based architecture provides a clean method of including application-specific knowledge from human experts. Once scenario elements are defined, all rule sets are automatically learned.

The Combiner is a powerful logic tool for evidence accrual. It solves the "chicken-and-egg" dilemma caused when relying on scenario-dependent programs to determine the scenario for a sample. It handles heterogeneous inputs and delivers heterogeneous outputs.

Because of its straightforward approach, the rules and reasons the Combiner reaches its conclusions are easily available for accountability and tracability. Scenario weights are never explicitly needed by an operator, but are available and deliver a wealth of additional information about the real-world conditions affecting a sample.

This dissertation documents the Combiner and its superior performance against Multicategory Classification, Dempster-Shafer, and the best Method in the Aroclor Interpretation suite.

1. Introduction

1.1 The Need For Automated Environmental Data Interpretation

The United States Department of Energy (DOE) faces a daunting environmental remediation problem. This problem is large in both the number of sites contaminated and in the number of potential contaminants. The *environmental remediation (ER) process* seeks to contain or clean every contaminated site. This process starts by *characterizing a site*: that is, by detecting and quantifying the materials contaminating the water, air, soil, plants, wildlife or anything else present. Characterization detects specific contaminants, called *target analytes* in samples from the site. To do this, laboratories rely on instruments, Environmental Protection Agency (EPA) approved analysis methods and skilled human interpretation. Characterization is necessary, expensive and time-consuming. In 1995, the DOE needed two million characterizations. With increasing emphasis on restoring the environment, the combined DOE and Department of Defense (DoD) ER forecasts are for 50 million sample characterizations annually by the year 2000 [1]. In 1995, laboratory costs for characterizing sites accounted for \$30 billion of the \$160 billion ER business. By the year 2000, characterization costs will comprise \$55 billion of the predicted \$220 billion annual ER industry total [2]. While laboratory customers face rising bills, the laboratories face rising volumes and a wide variety of contaminants. The DOE ER effort alone must handle organic, metal, and radionuclide contamination, each with widely varying laboratory requirements.

The *Contaminant Analysis Automation (CAA)* Project [3] is the DOE's response to its increasing characterization needs. The first characterization process automated by CAA detects complex mixtures of *polychlorinated biphenyls (PCBs)* called *Aroclors*^{TM*}.

Monsanto Corporation sold Aroclors from 1929 to 1978. They have become an environmental concern as carcinogens.

1.2 Automated Sample Characterization

CAA automates the chemistry laboratory process. Figure 1 shows the three discrete steps in this process. This section describes the general laboratory process, the CAA generic laboratory process, and the Aroclor-specific CAA laboratory process.

Figure 1: CAA seeks to automate all three laboratory steps

* Aroclor is a registered trademark of Monsanto Corporation.

1.2.1 General Laboratory Process To Characterize Environmental Samples

Whether processed manually or by automation, characterizing an environmental sample progresses through three steps. These steps are:

- 1) *sample preparation*, which chemically and physically prepares the sample for chemical measurement;
- 2) *sample analysis*, which produces raw data from the prepared sample;
- 3) *data interpretation*, which converts raw data into a quantitative assessment of the contaminants present in the processed sample.

1.2.2 Generic Automated Laboratory Process

In the automated laboratory, equipment called *Standard Laboratory Modules (SLMs)* [4] accomplish the sample preparation step. SLMs produce the material for the sample analysis step. Generally more sophisticated and specialized than SLMs, *Analytic Instrument Modules (AIMs)* execute the sample analysis. Automated *Data Interpretation Modules (DIMs)* [5] complete the final step of the laboratory process. DIMs interpret the data produced by the AIMs and report the character of the sample. SLMs, AIMs and DIMs can be mixed and matched to specifically suit a target analysis. A reusable infrastructure supports the analysis-specific SLMs, AIMs, and DIMs, as shown in Figure 2.

Figure 2: CAA plugs analysis-specific modules into a reusable infrastructure

The reusable infrastructure supplies communications protocols as well as laboratory necessities. Software includes a user interface, a task sequence controller and a database for holding methods and results. Connections are available to add a commercial laboratory information management system (LIMS).

The CAA design separates the permanent parts from analysis-specific parts. As a consequence, switching among different target analytes becomes a matter of swapping analysis-specific parts. Similarly, the control software comprehends and executes instructions that are specific to an analysis, even though the control software remains permanent. This "plug-and-play" design minimizes the disruption of work when switching among target analytes.

By doing three things, CAA optimizes the volume of samples characterized: (1) it operates around the clock, (2) it reduces disruption during analysis changes, (3) it reduces

the *turn-around* time for characterizing a sample. The turn-around time measures how long it takes to receive the laboratory report from the time that someone collects the sample at an ER site. The CAA laboratory is in a movable trailer so that it travels to the characterization site. This reduces turn-around time for its samples by eliminating the traditional transportation delays and risks. Given an adequate supply of samples, reducing the turn-around time for a sample increases the volume of samples characterized.

1.2.3 Automated Laboratory Process For Characterizing Aroclors

In CAA's Aroclor analysis, the laboratory receives a sample of potentially contaminated soil. Sample preparation SLMs convert the soil into a liquid sample. A gas chromatograph AIM measures materials in the liquid and produces data as a chromatogram. The Aroclor DIM interprets the signals in the chromatogram and makes its report. In August of 1995, the CAA laboratory-in-a-trailer drove from Los Alamos National Laboratory (LANL) to Albuquerque, New Mexico. There, SciBus Analytical, Incorporated [6] and LANL demonstrated the sample preparation and the sample analysis steps for Aroclors [7]. LANL also demonstrated a preliminary version of the Aroclor DIM, containing five automated pattern recognition methods but without a Combiner. Further research, presented in this paper, developed the Combiner and completed the DIM.

Since the 1995 demonstration, the relationship between SciBus Analytical, Inc. has been replaced with a relationship with Advanced Power Technologies, Inc. and the project name has changed to *Chemical Analysis Automation*. CAA kept the preliminary DIM

and progress has continued independently at Los Alamos on the DIM using the Combiner presented in this paper. The Los Alamos DIM and Combiner have received interest only from the chemistry world [8], as well as facilities security applications and pharmaceutical researchers. CAA continues to test the Witherspoon site, 48 acres of landfill near Knoxville, Tennessee. This site is a DOE ER problem since it was licensed to receive depleted uranium during its active lifetime. Despite their collaborative design and function, there is no longer any relationship between CAA and the DIM.

1.3 Automated Data Interpretation Modules: The DIM

Difficulty of automation increases as the sample passes from step to step in the laboratory. The expertise and training of the persons traditionally performing these steps reflect this difficulty. As the ultimate step, the DIM faces uncertainty in how to do its task for a particular set of analytes, and, at the same time, the DIM requires much knowledge about its task. Furthermore, the DIM's internal framework must be flexible, since CAA is reusable for many analyses.

Manually, experts detect and quantify Aroclors in a gas chromatogram by relying on their experience and judgment. Nonetheless, errors in manual quantification of Aroclors in gas chromatograms typically range from 20% to 600% [9]. Humans are not alone in this trouble. The problem also defies accurate analysis by each of the DIM's five automated pattern recognition methods. For automation, the DIM needs to emulate the experience and judgment of the experts who currently do this work, though they cannot describe deterministically what they do. Furthermore, human experts often differ in their interpretations – as do the automated methods. The ill-formed nature of Aroclor

interpretation resists current, single-model classification methods. The DIM needs more advanced techniques to make sense of often-differing results from these methods. The Combiner presented in this research succeeds in combining uncertain results from a suite of pattern recognition methods.

2. Environmental Chemistry Background

This chapter presents some details of the traditional process of Aroclor Interpretation, the data that it produces, how to interpret that data, and the problems met with along the way. Using a batch of chromatograms, this chapter shows how and why the DIM's five automated interpretation methods fail. These failures motivate the need and show the basis for the Combiner.

2.1 The Aroclor Interpretation Problem

The EPA publishes guidelines which govern all Aroclor interpretation in the U.S., whether it is manual or automated. These guidelines are contained in *EPA SW-846 Method 8080* [10]. Specifically, they prescribe procedures "for the detection and reporting of Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography". CAA targeted three specific analytes covered by these guidelines. These three target analytes are *Aroclor 1242*, *Aroclor 1254* and *Aroclor 1260*. The differences in their names refer to the differing weight percentage of chlorine in each Aroclor.

Gas chromatography with electron capture detection (GC/EC) [11][12] separates the components of the physical sample and measures them in two dimensions. The x-axis represents retention time of a component in the gas chromatography column. It indicates the identity of the component since components "fall out" in the gas chromatograph's

column according to their molecular weight. The y-axis corresponds to the amount of the component in the sample. Each component creates a peak in the graph.

Because Aroclors are mixtures of PCBs, the chromatogram for a pure, single Aroclor contains 50 to 70 of 209 possible peaks. **Figure 3** shows representative chromatograms for Aroclor 1242, Aroclor 1254, and Aroclor 1260, respectively. The peaks at the right and left extremes of each chromatogram are not part of the Aroclor signals. These peaks are retention time markers, obtained by injecting materials with known retention times and areas into the sample. They are useful in comparing two chromatograms.

Figure 3: Chromatograms of Aroclors 1242, 1254 and 1260

An *unknown* is a chromatogram or sample with unknown contents. Before processing a batch of unknowns, operators produce a set of fifteen *standard chromatograms* (or *standards*). These standards are chromatograms of known material and concentration.

By comparing the chromatogram of an unknown to the fifteen standard chromatograms, a chemist estimates the quantity of each of the three Aroclors believed present. Laboratory administrators and chemists choose the standard concentrations based on the expected concentrations in the environmental samples. The standard concentrations establish the *calibration range* for the laboratory. In interpreting an environmental sample, concentration values outside the batch's calibration range are considered unreliable.

It has proven difficult to achieve accuracy in Aroclor data interpretation [9].

Complications arise all through the process:

1. An uncatalogable variety of materials occurs in samples taken from the real world. All materials produce either a *specific response* or a *nonspecific response* in a gas chromatograph. A specific response creates a peak. A nonspecific response distorts the baseline of a chromatogram, creating a "hump" on which the peaks seem to sit. Figure 4 shows this distortion for oil contamination. For the rest of this paper, the term *contamination* refers to any material other than the target analyte that produces a chromatograph response. This is contrary to the more natural view that Aroclors are contamination. For purposes of this paper, contamination from now on refers to signal effects rather than environmental ones. Two cases of contamination are of particular importance to the Aroclor problem:
 - a) The presence of multiple Aroclors in a single sample causes their signals to interfere with one another. This is because the chromatograms of the

Aroclors overlap along the retention time axis. The peaks of an Aroclor that overlap into a second Aroclor's time range act as specific contamination when trying to interpret the second Aroclor. So, too, the second Aroclor's peaks act as specific contamination when trying to interpret the first Aroclor.

- b) Sites containing Aroclors often also contain oil. Oil produces both specific and nonspecific responses in the chromatogram. These oil responses can distort, or obscure, or even emulate the Aroclor signal. The chromatograms shown in **Figure 4** illustrate the confounding effects of oil contamination on an Aroclor signal. The oil-contaminated chromatogram shows added peaks and a distorted baseline caused by the oil.

2. There are errors in the detection process. These errors stem from many sources and can be difficult or impossible to quantify. For example:

- a) The standards may be inaccurate or contaminated;
- b) There can be undetected instrument error or drift in the gas chromatograph;
- c) The mathematical separation of the components in the chromatogram is imprecise;
- d) There can be inaccuracies in model-building for both automated and manual pattern recognition methods.

3. The very nature of the Aroclor problem presents difficulties. For example:
 - a) As already discussed, peaks in Aroclor 1254's signal overlap the time ranges for peaks in the other two Aroclors;
 - b) Weathering over time can degrade an Aroclor lying in soil, causing its chromatogram to differ from a standard of fresh Aroclor;
 - c) Aroclor formulas varied during the many decades they were being produced. This means that standard chromatograms created from modern formulas may at best be only close approximations to those of a vintage Aroclor.
4. Experts solve this problem as best they can, but this expert knowledge is hard to quantify. Interpretation of Aroclors in gas chromatograms is the realm of experienced analysts, yet it is difficult to extract fixed rules from these analysts, or even a rule set that is not self-contradictory.
5. Calibration and training sets do not cover all prediction conditions. Training sets do not present contamination, weathering, different Aroclor formulas, or mixtures of Aroclors, among other conditions. A long memory of all the conditions one has seen is an advantage for an experienced human analyst. The automated methods and inexperienced analyst have only the pure standards against which to compare an unknown sample.

Figure 4: Chromatograms of Aroclor 1242 with and without oil contamination

Reducing the impact of these problems is crucial to interpreting Aroclors successfully.

Our approach succeeds by using both existing techniques and new key ones that come from the Combiner.

2.2 Prerequisites For Automated Data Interpretation

Successful data interpretation requires:

- (1) analyzable data;
- (2) assurance that nothing has contaminated the laboratory and samples are still running within the range of a valid calibration;

- (3) a way to interpret and report the contents of the data.

The following sections consider each of these requirements in turn.

2.2.1 Is The Data Analyzable?

For an AIM to be trustworthy, it must be able to give some estimate of whether it is producing analyzable data or not. An overly concentrated sample may leave some of its material in the laboratory equipment, thus cross-contaminating it. The data interpretation step can detect an overly concentrated sample, but the delay in detection caused by waiting until that step increases the number of other samples that may have been cross-contaminated. Many other conditions can also cause results to be unanalyzable.

Figure 5 outlines an *Analysis Assessment System (AAS)*. When made a part of the gas chromatograph AIM, the AAS continually tests the output of the AIM for signs of irregularities. The AAS studies a sample's chromatogram and forms a table of symptoms found, such as peak tailing or clipping. The AAS examines the symptom table through its expert system [13] to diagnose whether the AIM is running reliably.

Figure 5: AAS architecture

In Aroclor analysis, an on-board AAS senses errors and stops work without losing samples or ruining instruments. A malfunctioning or contaminated gas chromatography

AIM renders its output chromatograms useless, but an auto-loading instrument will continue to run samples from its tray and so it will waste the samples. The AAS can prevent costly delays or possibly the complete loss of samples. The AAS also supports automated data interpretation by ensuring that by a properly operating AIM generated the data.

2.2.2 Is The Laboratory Within Control Limits?

To generate data which is useful, a laboratory must be working within its control limits and without contamination. Samples of known content are processed through the laboratory at intervals to check performance. Section 2.1 introduced the *standard* and *unknown* chromatogram types. This section introduces two more types. Samples called *blanks* contain no materials. Samples called *controls* contain materials in known concentrations. The DIM assists with Quality Assurance and Quality Control by reporting the contents of blanks and controls and by detecting overly concentrated samples. The human chemist and the controller software monitor the reports to ensure that a calibration is still valid and that contamination of the laboratory has not occurred.

2.2.3 What Is In The Data?

Once the AAS confirms that the Gas Chromatograph AIM is running correctly, and the chemist and controller verify that the laboratory is in calibration, the DIM begins processing the data. First, the DIM passes the chromatogram to a *Reducer* that removes the baseline and retention time markers. Next, the DIM passes the reduced chromatogram to several pattern recognition *Methods*. Each Method examines the

chromatogram and produces an estimate, or *opinion* of the contents of the sample. The Aroclor DIM contains five pattern recognition methods that, like the experts, can disagree in their opinions.

The Combiner synthesizes a *final result* from the opinions of the Methods. The Combiner's task is to make sense of these potentially contradictory opinions.

The Combiner passes the final result to the *answer object*. The answer object archives data and converts return codes according to the sample type. It also passes the final result and return code to the system controller. An example of return code conversion is if the DIM finds that a blank contains an Aroclor, then the DIM reports to the task sequence controller that the laboratory is at risk of being contaminated. The DIM user can then view the opinions from the Methods, the results and explanations from Combiner; the answer object; and the original chromatogram.

Figure 6 outlines the overall DIM architecture. For the Aroclor DIM, the Combiner module receives opinions from five Methods. These five Methods are *Multiple Linear Regression (MLR)*, *Neural Network (NN)*, *Principle Components Regression (PCR)*, *Peak Area Analysis (PA)* and *Neural Network for Identification (NNI)*.

Figure 6: Simplified DIM architecture

2.3 Individual Pattern Recognition Methods

The Aroclor DIM relies on five pattern recognition Methods. Like human chemists, the Methods compare the sample chromatogram to the standard chromatograms to produce their estimates. The digitized chromatograms used by the Methods contain approximately 14,000 data points each.

Multiple Linear Regression (MLR) does not receive explicit calibration or training. Instead, it uses full chromatograms in its computations. MLR dynamically mixes the standards for comparison with each unknown. MLR returns quantity estimates for each Aroclor.

Neural Network (NN) and Neural Network for Identification (NNI) are two unrelated algorithms, although they share names and the same author. For each Aroclor, the NNI peak interpolation algorithm returns the probability (0-100%) that NNI believes the Aroclor is present. NN is a probabilistic network that returns quantity and quantity-error estimates for each Aroclor [14].

Principle Components Regression (PCR) selects orthogonal subsets of peaks called *factors* from the standards. It compares these factors to each unknown chromatogram. PCR uses assistance from the chemist during its training to determine when to stop adding factors to its models. These factors capture most of the linear variation among the standard concentrations for an Aroclor. This Method discounts signals that are constant or scale nonlinearly across the standards as noise. PCR returns quantity and quantity-error estimates for each Aroclor [5].

Peak Area (PA) analysis emulates the method traditionally used by a chemist. A chemist calibrates (trains) PA for each new set of standards. The chemist indicates to PA which peaks the chemist believes are proportionally sensitive to changes in an Aroclor's concentration. PA measures the areas of these peaks and their proportions relative to one another for each Aroclor's standards. For each Aroclor, PA produces a composite profile called a *model* by examining the selected peaks in each standard. A theoretical composite of the standards forms the basis of this

model, and it is an average concentration. PA analyzes an unknown in several steps. First, the selected peaks in the unknown must have the characteristic relative areas PA summarized in its model. Second, to quantify the amount of Aroclor present, PA compares the areas of the unknown to the values in the model, and scales accordingly. Lastly, the Method checks the quality of its quantification estimate against each selected peak. If the variation in scaling is too large, PA disqualifies its answer and returns "0". Quantity error measurements also come from this internal goodness-of-fit check. PA returns quantity and quantity-error estimates for each Aroclor [15].

2.4 Calibration Control Samples

Batch 0 is a set of standards created at the Oak Ridge National Laboratory. Chemists created 15 standard samples each containing a single pure Aroclor in concentrations of 0.05, 0.10, 0.20, 0.40 and 0.80 $\mu\text{g/ml}$, for Aroclors 1242, 1254, and 1260 respectively.

Batch 1 is a set of test samples, also created at Oak Ridge National Laboratory. This Batch contains seventy-five samples, each of known material and concentration. These *test* samples, and their chromatograms, simulate unknowns. Some samples in Batch 1 contain oil. The Aroclor AIM produces a chromatogram for each sample in Batches 0 and 1. The five DIM Methods analyze each chromatogram, producing four quantity estimates and one identity estimate (from NNI) for each of the three Aroclors. The following section discusses the quality of these estimates.

2.4.1 Aroclor Quantity Estimates

A chemist translates quantity estimates that are smaller than a *Minimum Detection Limit (MDL)* to zero. The MDL is 50% of the smallest standard concentration. For Batch 1, $.5 \times .05 \mu\text{g/ml}$ results in an MDL of $.025 \mu\text{g/ml}$. The *Upper Detection Limit (UDL)* is 10% greater than the largest standard concentration. For Batch 1, $1.1 \times .80 \mu\text{g/ml}$ results in an UDL of $.88 \mu\text{g/ml}$.

Figure 7 shows the quantity ranges and interpretations for Batch 1. A quantity estimate less than (or equal to) the MDL is Below Detection Limits (BDL). A quantity estimate greater than (or equal to) the UDL is Above Detection Limits (ADL). Quantity estimates that are neither BDL nor ADL are Within Detection Limits (WDL).

Figure 7: Quantity ranges for Batch 1

2.4.2 Aroclor Identity Estimates

For each Aroclor, Method NNI returns an identity estimate, which is an integer between 0 and 100. This number reflects NNI's strength of belief. NNI answers the question, "Is

the Aroclor present?" **Figure 8** shows identity ranges and their classifications, as does the following list.

- 1) Values from zero to 40 mean No. NNI concludes that the Aroclor is absent.
- 2) Values from 70 to 100 mean Yes. NNI concludes that the Aroclor is present.
- 3) Values from 41 to 69 mean Maybe. NNI cannot state whether the Aroclor is absent or present.

Figure 8: NNI Identification ranges for Batch 1

2.5 Performance Of Pattern Recognition Methods

2.5.1 Investigating Legitimate Disagreements Among Method Opinions

Like human experts, the Methods can disagree and still be valid. **Example 1** demonstrates this phenomenon, and this section begins to reveal why this happens.

Sample	Sample Type	MLR	NN	PCR	PA	NNI
A	Single, pure Aroclor	0.10	0.10	0.11	0.10	1.00
B	NonAroclor materials and one Aroclor	0.03	0.26	3.05	0.35	0.11

Example 1: Method agreement and disagreement

Example 1 shows the Methods' opinions for Aroclor 1260 in two samples. For sample A, the five Methods agree that Aroclor 1260 is present. The amount of 1260 in this sample is .100 µg/ml, which corresponds with the reported quantities. Recall that NNI's value of 1.0 indicates a 100% belief that the Aroclor is present.

In contrast, opinions for Sample B range from extremely high concentration of 1260 from PCR to no 1260 at all from MLR and NNI. NNI's value of .11 is interpreted as "absent". These contrary opinions come from properly written and trained Methods. The problem is that they are operating outside their training domain. The next section discusses this problem in further detail.

2.5.2 Effect Of Operating Inside Or Outside The Methods' Training Domain

Like their human chemist counterparts, the Methods have only the fifteen standards to use for training. Batch 0 is the Method training set. The samples in the Method training set contain only single, pure Aroclors in concentrations that are within the calibration range. The conditions varied within the training set establish the *training domain*. The concentration of a single pure Aroclor is the only condition varied within Batch 0, and it only varies within the calibration range.

This section explores the effect of operating outside the Methods' training domain. The

DIM Methods processed each sample in Batch 1. Each sample received three *judgments* from each Method, one for each Aroclor. For clarity, this demonstration ignores any error estimates from the Methods. This analysis classified each opinion as present or absent according to the following definitions. BDL and No indicate absent. WDL, ADL, Yes, and Maybe indicate present. Counting Maybe response as present instead of absent is important. This biases the reporting toward False Positives instead of False Negatives. False Positives falsely report an Aroclor present when it is not really in the sample. False Negatives falsely report an Aroclor absent when it is in fact present. In Aroclor Interpretation, a False Negative has the potential to mark as safe what is instead an environmentally dangerous site. A False Positive merely causes further testing.

Batch 1 contained 27 samples that were inside the batch's training domain. This means that conditions in these samples varied from the training domain only in the trained variable, which was the concentration of a single pure Aroclor within the calibration range. **Figure 9** illustrates the individual Methods' accuracy on these samples from inside the training domain.

Figure 9: Method performances inside the training domain (Batch 1, ignoring error estimates)

As detailed in Section 2.1, unknowns can be many things other than a single uncontaminated Aroclor within the calibration range. The real-world variety of unknowns makes up the Aroclor Interpretation *testing domain*, a superset of the Methods' training domain. **Figure 10** shows the relationship of these domains, and the types of samples found in them.

Figure 10: Sample types in the training domain and in the testing domain

When faced with environmental samples from throughout the testing domain, the Methods must predict in the presence of no Aroclor, of single Aroclors, or of multiple Aroclors, or with an Aroclor signal above detection limits. Additionally, there may be materials present that cause nonrandom signals in the chromatograms.

Batch 1 contained 75 samples, each of which was analyzed for three Aroclors. Table 1 shows the distribution of samples and types in the Batch 1. Batch 1 did not equally represent the various types in the testing domain.

Sample Type	Number	Percentage
Blanks	5	8%
Single, pure WDL Aroclors	27	36%
Single, pure ADL Aroclors	0	0%
Multiple Aroclors, none ADL	21	28%
Multiple Aroclors, at least one ADL	0	0%
NonAroclor materials only	2	3%
NonAroclor materials and one WDL Aroclor	6	8%
NonAroclor materials and one ADL Aroclor	0	0%
NonAroclor materials and multiple Aroclors, none ADL	14	18%
NonAroclor materials and multiple Aroclors, at least one ADL	0	0%
Total	75	100%

Table 1: Sample type distribution in Batch 1

Figure 11 shows Method performances on samples outside the training domain. Because these samples are outside the training and calibration domains for the Methods, both the results and their error measurements are suspect. The Methods can often produce reasonable results in these conditions but are not guaranteed to do so. Due to the lack of guarantee for a Method's accuracy, Method estimates are referred to as *opinions*.

Figure 11: Method performances outside the training domain (Batch 1, ignoring error estimates)

No single Method was accurate on every sample type. Our approach uses the fallible Methods in aggregate to use their opinions intelligently and produce confident results.

2.5.3 Inflexibility Of The Training Domain Restriction

An environmental laboratory must be recalibrated at specific intervals or whenever a deviation is noticed. To recalibrate, a chemist must prepare five samples of known concentrations for each Aroclor. The samples are processed through the GC/ECD and each produces a chromatogram. These fifteen standard chromatograms are expensive in both time and components due to their frequency and accuracy. The chemist will use these new standards to compare subsequent chromatograms from unknown samples; similarly, the five Methods must also be retrained with new standards any time they are generated. Practical constraints pressure the automators to work within this minimum calibration, that is, to only train on the fifteen traditional standards.

The conditions outside the training domain in Batch 1, the results of which are illustrated in **Figure 11**, reflect only a tiny portion of all possible distortions to an Aroclor signal in a chromatogram. It is computationally intractable to recreate and use the entire testing domain conditions for calibration and training. **Figure 10** is partitioned into only ten subsets, but every material on the planet in combinations and under every weathering condition can be found in it. This real-world variety of unknowable contamination in a chromatogram is the reason the DIM needs multiple models and an intelligent way to combine their results in Aroclor interpretation.

2.5.4 Using Multiple Methods To Detect Failures And Extract Information

Simple performance measurements, such as shown in **Figure 9** and **Figure 11**, do not tell how, or even when, to combine the Methods' opinions. However, the diversity of types of

failures gives clues that no Method could give when working alone. With enough knowledge relating Method failure modes to the conditions in the sample, an intelligent Combiner can pry sample type information from these opinions. Learning about the sample types is one key to using multiple models for Aroclor interpretation. The second key is its dual, using information relating Method result quality to sample type in order to unravel clues about a sample's contents.

The Aroclor Interpretation Problem has three characteristics that allow multiple models to be used synergistically.

- All Methods can fail. Had all Methods worked accurately on all sample types, the reliability needs and vulnerabilities would not be significant enough to require redundancy, let alone a Combiner: any one Method would have provided adequate results. Instead, the Methods sometimes fail.
- Methods fail somewhat deterministically. Each Method operated with a similar degree of accuracy on any two samples of the same sample type. There is some generally consistently displayed relationship between sample type and failure mode. These descriptions of "generally consistently" and "somewhat deterministically" are the first clues that there is cause-and-effect structure underlying the Aroclor Interpretation problem, but that this structure is not rigid enough to quantify precisely.

- Methods fail divergently. If all Methods performed with the same accuracy on each sample type, no new information could be gained by aggregating their opinions. To show the difference between convergent and divergent behavior, **Table 2** summarizes the correlation among Methods' opinions in two ways. **Table 2(a)** shows high correlation among the Methods' opinions for samples that were inside the training domain. This indicates that the opinions among the Methods were tracking well with one another. This is to be expected since each Method works fairly well within the training domain. **Table 2(b)** shows low correlation among the Methods' opinions for samples that were outside the training domain. This indicates that the opinions among the Methods did not track with one another: for example, no nonrandom relationship between MLR's opinions and PCR's opinions could be determined. When these Methods failed, they failed in Method-specific ways. The calculations follow the Table.

	MLR	NN	PCR	PA	NNI		MLR	NN	PCR	PA	NNI
MLR	1.00					MLR	1.00				
NN	0.99	1.00				NN	0.20	1.00			
PCR	1.00	0.99	1.00			PCR	0.00	0.29	1.00		
PA	0.60	0.62	0.59	1.00		PA	0.77	0.09	-0.18	1.00	
NNI	0.70	0.69	0.72	0.32	1.00	NNI	0.59	-0.21	-0.37	0.60	1.00

(a) (b)

Table 2: Correlation between methods a) inside training domain b) outside training domain (Aroclor quantification, Batch 1)

The correlation of one Method's opinions with another Method's opinions was calculated on a sample by sample, Aroclor by Aroclor basis, using *linear correlation calculations* shown in Equation (1) to produce *Pearson's r* [16].

$$r = \frac{\sum_i (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \bar{x})^2} \sqrt{\sum_i (y_i - \bar{y})^2}} \quad (1)$$

A vector of results from one Method is x and a vector of results from another Method becomes y . For sample i , x_i and y_i represent the first Method's result and the second Method's result for the same sample. Linear correlation coefficients measure the degree to which variations in one parameter are reflected by changes in the other; they determine nothing about cause-and-effect.

Correlation coefficients range from $[-1,1]$. Positive correlation (correlation greater than zero) indicates that increases in the first parameter correspond to increases in the second parameter. Negative correlation, indicated by correlation coefficients less than zero, indicates that increases in the first parameter correspond to decreases in the second. The strength of a correlation increases with its difference from zero. Values near either extreme of the range show tight coupling of the parameters' behaviors over the sample set. Values near zero mean that knowledge of the first parameter's value gives very little insight into the value of the second parameter.

The mathematics of Equation (1) can be interpreted as first subtracting a vector's average value from each value in the vector, so that only variations are studied. Subtracting the

average means that the variation in the remaining values is distributed around zero. Two vectors of random positive and negative numbers "average out" toward zero when multiplied in the numerator. This means that the more x_i s that are near their corresponding y_i , the closer the entire equation evaluates to positive 1. Also, the more x_i s that are near the additive inverse of the corresponding y_i (that is, $y_i * -1$), the closer the entire equation evaluates to negative 1. Equation (1) was implemented using Matlab's *corrcoef* function [17].

2.5.5 Extracting Information From Simple Rules

Returning to **Example 1**, even the crude information extracted so far improves the quality of the interpretations. The following rules can be abstracted for determining basic sample type.

Rule 1: Agreement among methods suggests that the sample is within the training domain.

Rule 2: Disagreement among methods suggests that the sample is outside the training domain.

Rules can also be expressed relating Method result quality to sample.

Rule 3: For a sample within the training domain, every method's results are pretty good.

Rule 4: For a sample outside the training domain, no method's result is guaranteed.

Example 1 can be analyzed first for sample type (via **Rule 1** and **Rule 2**) and then for result quality estimation (via **Rule 3** and **Rule 4**). Agreement among Methods for sample A's results suggests a likelihood that the sample was within the training domain (Rule 1). Within the training domain, all Methods work fairly accurately (**Rule 3**). Since this sample appears to be inside the training domain, the Methods were working correctly, and their opinions can be used to produce a fairly confident answer.

Disagreement among Methods for sample B in **Example 1**, however, is a symptom that some condition not indigenous to the training domain has occurred. The sample lies outside the Methods' training domain (**Rule 2**). All that can be concluded from this rudimentary rule set is that the stated results are not necessarily reliable (**Rule 4**).

2.5.6 An Example Of More Advanced Information

To further characterize Method failure types, Method results from Batch 1 were reclassified as:

- 1) *False Positive (FP)*, which incorrectly indicates the presence of an Aroclor
(Method result of Yes, WDL or ADL) in a sample not containing that Aroclor;
- 2) *False Negative (FN)*, which incorrectly indicates the absence of Aroclor
(Method result of No or BDL) in a sample containing that Aroclor;
- 3) *True Positive (TP)* which correctly indicates the presence of an Aroclor
(Method result of Yes, WDL or ADL) in a sample containing that Aroclor;

4) *True Negative (TN)* which correctly indicates the absence of an Aroclor

(Method result of No or BDL) in a sample not containing that Aroclor; and

5) *Maybe* which indicates the Method result was Maybe.

Figure 12 shows the failure modes for Batch 1, for samples both inside and outside the training domain.

Figure 12: Method performance modes (Batch 1)

Batch 1 did not equally represent sample type, resulting in possibly disproportionate weighting of performance modes. With that imbalance in mind, Figure 12 represents performance mode information, which in turn can be translated into the reliability of

opinions for an unknown sample. For example, NNI often returns false negatives, thus the intelligent Combiner can observe that:

Rule 5: For a sample outside the training domain, Method NNI produces frequent False Negatives.

Reevaluating the Method opinions for Sample B in **Example 1** with **Rule 5's** information, the NNI opinion voting against the presence of Aroclor 1260 can be discounted. This leaves, using the limited rules available, belief in the presence of Aroclor 1260. In reality, Sample B did contain .100 µg/ml of Aroclor 1260, in the presence of oil contamination.

2.5.7 Summary And Preview

Example 1 gave a simple overview of the value of studying and quantifying the behaviors of the DIM Methods. A rudimentary ad-hoc rule set was also derived to illustrate how the Methods' behavior may be exploited.

Additional knowledge must be developed and incorporated in order to draw conclusions of use to an environmental chemistry laboratory. Figure 13 shows a preview of the Combiner and its components to be developed in detail in later chapters. The Combiner's first step is Scenario Identification (SI), which calculates a test sample's position in the testing domain. The testing domain is partitioned into scenarios. For each Method, its accuracy differs among scenarios. To analyze a test sample with the Combiner, first the SI step assigns a belief to each scenario in the testing domain, called the scenario weight,

that reflects the likelihood that the test sample belongs in that scenario. Next, the Combiner uses the scenario weight to compose the most confident and accurate result possible, by knowing the accuracy of Methods in the scenarios, in the Aroclor Presence (AP) Detection step and Aroclor Quantification (AQ) step. Together, the AP and AQ steps complete the characterization of the test sample by identifying and quantifying any Aroclors that are present.

Figure 13 : Preview of Combiner Architecture

The purpose of this dissertation is to explore disagreement among the pattern recognition Methods and develop a means, called the Combiner, to exploit the information contained in it in an algorithmic way. The Combiner succeeds in identifying correct data from fallible Methods to produce confident results.

3. Computer Science Background

This chapter presents the Aroclor interpretation problem's rich connections to many subjects. The first section shows Aroclor interpretation as a *multivariate calibration* problem. Next, three existing approaches to operations done by the Combiner are presented. Finally, we present new resources from artificial intelligence that lead to a more intelligent Combiner.

3.1 Aroclor Interpretation As A Multivariate Calibration Problem

Whether done by a human or a mechanized operator, Aroclor interpretation is a *multivariate calibration* problem. Multivariate calibration problems have two phases. The first phase is *calibration*. The operator analyzes a set of control samples. Then the operator, knowing the contents of the control samples, builds models based on the analyzed data. The second phase is *prediction*. In this feature, the operator compares features of data from an unknown sample to the calibrated models [18].

Two factors are key to the success of a multivariate calibration system. First, the extent to which the unknown samples, or "real world", match the control samples used in calibration. Second, eliminating or quantifying errors in both phases.

The Aroclor interpretation problem cannot satisfy either requirement. Section 2.1 summarizes the intractability of making the training domain match the testing domain for the Aroclor interpretation problem. This means that the first requirement is unsatisfied for Aroclor interpretation.

The second requirement is to identify and remove errors in the process. On samples outside the training domain, Methods may not accurately report values or errors. This means the second requirement is also unsatisfied. Other factors also prevent satisfying the second requirement. One such factor is the lack of "ground truth" even in the standards. There is no check of the actual concentration of a standard. When a chemist says a standard is .200 $\mu\text{g/ml}$ concentration, the operator reports anything that matches that standard as .200 $\mu\text{g/ml}$ without error. A variety of stubborn error sources keeps chemists and automators from eliminating or measuring all sources of error in this nontrivial chemical process [19]. Thus, the second requirement cannot be satisfied either.

The Aroclor interpretation problem is not alone in its ill-formed nature. Solutions to many similarly ill-formed but naturally occurring problems would be welcome. To quote Thomas [18], "However, for many emerging analytical methods (e.g.,...environmental materials), it might not be possible to control such factors. The ability to overcome these obstacles will largely influence the success or failure of a calibration method in a given application".

Our approach to the DIM compensates for the Aroclor interpretation problem's stubbornness by loosely meeting these requirements. By using fuzzy logic and by extending the DIM training domain, the DIM matches every unknown to the DIM training domain, at least to some degree. Fuzzy logic and automated learning allow the DIM to weight its belief in each opinion for an unknown sample, based on similar known samples. Beliefs range from zero to one, including partial values. The DIM intelligently uses the poor-quality information that is available in this ill formed problem.

3.2 Historical Approaches

The Combiner does its work in three steps: 1) Scenario Identification (SI); 2) Aroclor Presence Detection (AP) and 3) Aroclor Quantification (AQ). These are shown in Figure 13. This section presents existing techniques for each step. Later chapters compare the performances of these competitors and the DIM.

3.2.1 Multicategory Classification (MCC)

The Combiner needs rules to assign an unknown sample to a scenario in the DIM training domain. For traditional expert systems, a human expert defines dependencies, using classical "If A then B" rules. There is no such expert in the Aroclor Interpretation domain. Instead, automated learning from a control batch reveals the rules.

One Method of generating classification equations is *Multicategory Classification* (MCC) [20]. MCC is a reward-and-punishment scheme to develop a set of weights for input vectors, one set for each possible category. When given an unknown input vector, the set of weights producing the highest output value determines the input vector's category.

This reward-and-punishment algorithm assigns weights to each element of the vectors to be classified. Initially, the decision functions - which consist of a vector for each possible category, and containing one element for each element in each input vector - set all weights to zero. These weights become decision functions through the following steps: An input vector is multiplied with each class's decision function. The decision function with the highest result indicates classification in the class associated with that decision function.

When the decision functions do not correctly predict a proper classification, the weights are readjusted. This is done by subtracting the misclassified input vector from the class decision function for each class that is not its correct class, and adding it to the class decision function for the proper class. This process iterates until all input vectors are correctly classified in a single pass or until an iteration limit is surpassed. Convergence indicates that the class decision functions produced can be used to separate the space represented by the input training set.

3.2.2 Dempster-Shafer

Reacting to multiple sources of non-identical data is a less well-studied branch of data validation. Rauch describes *analytic redundancy* as "...multiple sensors measuring diverse quantities related by a mathematical model" and uses results gained from analytic redundancy for diagnosis of and response to faults [21]. *Data fusion* can be used to exploit analytic redundancy in establishing the value of a result from multiple, not-necessarily-identical, sources if certain conditions hold [22]. A traditional data fusion method to combine sensor data is the *Dempster-Shafer generalized Bayesian approach* [23]. This method uses information about each source, specifically, the probability that it is correct, so that a form of weighted combining can be done. By disconnecting belief that an outcome is true from belief that it is false, Dempster-Shafer steps out of the restricted, binary yes-or-no logic of majority voting and other simpler techniques.

Belief for a proposition s is called the *support* of s , and is represented as the probability mass $M(s)$. Belief against a proposition s is called the *dubity* of that proposition, and is represented as the probability mass $M(\bar{s})$. A *frame of discernment* describes all possible

combinations of propositions or outcomes. Once all possible outcomes are listed and their probability masses established for one source, the remaining probability mass for that source is assigned to the outcome called *uncertainty* or θ . The probability mass assigned to uncertainty is $M(\theta)$. The sum of the probability masses for all outcomes $M(s) + M(\bar{s}) + M(\theta)$ is equal to 1.

Dempster-Shafer combines probability masses by using support, dubiety, uncertainty, and by using the sum of support and uncertainty called the *plausibility* of a proposition.

Figure 14 illustrates the Bayesian belief that all probabilities must add up to one, as shown in the top line graphical equation. Since evidence provides support and dubiety, and Bayes probability requires the total probabilities to sum to one, Dempster-Shafer surmises that the probability not accounted for by evidence is the uncertainty for the event. To calculate the highest probability that a proposition or event occurred, the second graphical equation shows the composition of plausibility as all the probability that does not consist of evidence directly against the proposition.

Figure 14: The relationship among support, plausibility and uncertainty interval in the Dempster-Shafer algorithm

To formulate the Aroclor interpretation problem for Dempster-Shafer, it is simplified to detecting whether or not each Aroclor is present in a sample. Thus, for each Aroclor each Method gives its belief for s if its opinion is positive or its belief for $\bar{s}$ if its opinion is negative. The strength of each belief is based on error measurements from the Methods. Probability not assigned to $M(s)$ or $M(\bar{s})$ is assigned to $M(\theta)$. Subscripts indicate the source for each probability mass.

The following paragraphs demonstrate how to apply DS to the Aroclor interpretation problem. First, Method MLR's results and Method NN's results are combined into a new virtual source called M1. M1's Uncertainty, $M_{M1}(\theta)$, is given by:

$$M_{M1}(\theta) = M_{MLR}(\theta) * M_{NN}(\theta) \quad (2)$$

M1's support for s , $M_{M1}(s)$, is obtained by combining the support and uncertainties of the two Methods in the following manner:

$$M_{M1}(s) = M_{MLR}(s) * M_{NN}(s) + M_{MLR}(s) * M_{NN}(\theta) + M_{MLR}(\theta) * M_{NN}(s) \quad (3)$$

M1's dubiety for s , $M_{M1}(\bar{s})$, is obtained analogously.

$$M_{M1}(\bar{s}) = M_{MLR}(\bar{s}) * M_{NN}(\bar{s}) + M_{MLR}(\bar{s}) * M_{NN}(\theta) + M_{MLR}(\theta) * M_{NN}(\bar{s}) \quad (4)$$

Second, the combined MLR and NN result, which is the virtual source M1, is combined with another Method, e.g., NNI. Finally, after two more pair-wise combinations, the probability masses for the combined five opinions is generated. The order in which sources are combined is irrelevant.

Dempster-Shafer's positive feature is that it does not require additional training.

However, two negative features point back to the lack of guaranteed performances by the underlying Methods. The first is that Dempster-Shafer is sensitive to the membership of the underlying suite. The second is that Dempster-Shafer is sensitive to the accuracies of the underlying suite. Due to the flexible configuration desired of the DIM Combiner, and the lack of guaranteed performances by the underlying pattern recognition Methods, Dempster-Shafer is too brittle to use for the DIM Combiner.

3.2.3 Majority Voting

Voting is a common form of validating nominally identical binary data, that is, data reporting either the presence or absence of a feature. For majority voting to conclude the correct result, a majority of the input data must be correct. Failures are not necessarily uncorrelated among the Aroclor pattern recognition Methods, so the correctness of a majority is not guaranteed in all situations.

Validating multiple reports of a quantity requires use of a fault-tolerant convergence algorithm. Again, a majority of the input data must be correct, or a faulty input must be obviously wrong. Examination of any one reported Aroclor quantity or identity does not contain enough information to indict the report as faulty. Thus, the Aroclor problem does not meet the criteria for using fault-tolerant convergence algorithms.

3.3 New Approaches

AI techniques such as expert systems allow some automated systems to monitor and diagnose conditions, as in the Research Animal Holding Facility aboard the Space Shuttle [24]. The Aroclor interpretation problem, however, lacks accurate human experts or mathematical models for the process.

Various surges in the field of artificial intelligence bring new insights and tools to pry apart the Aroclor interpretation problem. Some of these are approximate reasoning using fuzzy logic, integrating multiple models, anomaly detection and automated learning. The latter two techniques have produced the fields of data mining and knowledge discovery. The following sections introduce each of these fields.

3.3.1 Approximate Reasoning

Traditional solutions to combining results require rigid, well-formed behavior in a problem; as previously seen, the Aroclor problem does not fit into this category. However, the Aroclor interpretation problem has some underlying structure through which humans determine approximate answers. For the intelligent Combiner, the

implementers of the DIM turned to a model advanced as a more human-like alternative for uncertain but structured problems. This model is called *approximate reasoning*.

Approximate reasoning uses fuzzy logic instead of binary logic for its underlying mathematics [25]. Fuzzy logic is a mathematical way to capture vague information. By assigning truth in continuous degrees from 0 to 1, fuzzy logic can naturally emulate linguistic qualifiers such as "near" or "very". This multivalued logic is based on the concept of partial set membership from fuzzy set theory.

An overview is in order for the readers not familiar with fuzzy systems. A representative fuzzy logic system can be viewed in three parts [26]: 1) Fuzzification: Mapping a "crisp" number into a fuzzy variable; 2) Reasoning: Manipulating the fuzzy data; and 3) Defuzzification: Converting a fuzzy output into a crisp number. Fuzzy logic differs from binary logic in its underlying mathematics. The following section demonstrates the differences between fuzzy set theory and binary set theory, and motivates fuzzy logic's suitability for the Aroclor Interpretation problem.

3.3.1.1 Fuzzy Set Membership

To contrast the difference between binary set membership and fuzzy set membership, we examine the concept "near". Pair-wise agreement for two results, x and y , is based on the membership definition for a set, $Near$ and the difference $d = |x - y|$ between two values x and y .

The most restricted definition of nearness is strict digit-by-digit equality. A definition for the set N_E (Near by Equality) is shown in Equation (5).

$$N_E = \{(x, y) \ni |x - y| = 0\}$$

(5)

A set can be equivalently defined by its membership function. The membership function μ_{N_E} for set N_E is shown in Equation

(6).

$$\mu_{N_E}(x, y) = \begin{cases} 1 & \text{if } |x - y| = 0 \\ 0 & \text{otherwise} \end{cases}$$

(6)

Simple differences in rounding Methods or computational precision among techniques can be enough to make N_E of no practical value. To ignore trivial differences, a threshold distance ε can be used to disregard some amount of difference: Method opinions differing by less than ε from one another would be considered near one another and agreeing. Equation (7) shows this relaxed definition of N_T (Near by Threshold). Its membership function, μ_{N_T} follows in Equation (8).

$$N_T = \{(x, y) \ni |x - y| \leq \varepsilon\} \text{ for some threshold distance } \varepsilon$$

(7)

$$\mu_{N_T}(x, y) = \begin{cases} 1 & \text{if } |x - y| \leq \varepsilon \\ 0 & \text{otherwise} \end{cases}$$

(8)

This method avoids the unrealistic demand for exact equality and is an easily understood method of determining whether two numbers agree. Obviously, μ_{N_T} is highly sensitive to the value of ε . This sensitivity is demonstrated in Figure 15(a). Two pairs of methods result in two absolute differences, called a and b . Values a and b are close to one another: but because one falls inside the threshold distance and one falls outside, their

membership function values are very different, causing an abrupt boundary condition change. Moving ε merely changes the locus of the nonlinear response, not the impact of the nonlinear behavior. Thus μ_{N_F} is a very chaotic function in that an infinitesimal change in the inputs can cause a massive change in the outputs.

Figure 15(b) shows a more robust, fuzzy interpretation of nearness, N_F (Near by Fuzzy Measure). Fuzzy logic allows the degree of membership in the set N_F to be any real number in the range from 0 to 1, inclusive. Therefore, two values such as a and b which are close on the value axis will have values close to one another on the membership value axis. μ_{N_F} is shown in Equation (9).

$$\mu_{N_F}(x, y) = \max(1 - |x - y|, 0) \quad (9)$$

This smoothing of chaotic boundary conditions is the key to the success of fuzzy logic controllers [27].

Figure 15: Difference in boundary condition changes: (a) crisp “near” has abrupt discontinuous change (b) fuzzy “near” has a graded change

3.3.1.2 Fuzzy Set Operations, Implications And Conversions

The fuzzy sets formed by continuous valued membership functions have a variety of possible forms. In the translation (called fuzzification) between crisp value represented by a single scalar and fuzzy variable, the fuzzy center of mass corresponds to the crisp value. The remaining variation in the shape of the fuzzy set describes the degree of belief one holds in the various possible values. The shape of a fuzzy set has only a few requirements. It should be convex, it should contain at least one element with membership function 0, and at least one element with membership function 1 [25]. These requirements enable fuzzy logical operators to combine these sets. Fuzzy set membership functions may be linear (linear growth or decay), sigmoidal (to represent a Poisson process), or bell shaped (a fuzzy number, or the idea of "near" a value). Triangular or trapezoidal shapes, like bell shapes, are useful for "smearing" an uncertain value through a widened range of possible values. The selection of shapes, beyond the natural ones associated with the above mentioned types, is an implementation option.

Fuzzy set theory also defines fuzzy extensions to the operations of *intersection*, *union* and *complement*. In a given universe, fuzzy set theory uses min as the intersection of two fuzzy sets, max as the union of two fuzzy sets, and not as the one's complement of a fuzzy set. **Figure 16** shows two fuzzy sets and their intersection and union; **Figure 17** shows the complement of a single fuzzy set.

Figure 16: Demonstrations of fuzzy sets A and B, their conjunction ($A*B$), and disjunction ($A+B$)

Figure 17: Demonstration of fuzzy set A and its complement ($\text{not}(A)$)

Implication and modus ponens are generalized to remain the basis of fuzzy reasoning just as they are in Aristotelian reasoning. Fuzzy implication combines two or more antecedent fuzzy sets producing a consequent fuzzy set. In the case with one antecedent fuzzy set A and one consequent fuzzy set B , fuzzy reasoning works as follows. In the system knowledge, a rule $A \Rightarrow B$ for sets A and B is defined. When a crisp number a , is presented as input it is necessary to interpret a 's instance of A in the set B . **Figure 15(b)** shows graphically how the membership function, $\mu_A(a)$, for a crisp value a is determined visually. First, a line is run straight up from the element value a it intersects the boundary that describes the fuzzy set. Next, a line is projected from that intersection

point onto the y-axis to get the result. $\mu_A(a)$ is the membership function for that element of the universe. This expresses the grade of membership for a in A . Once $\mu_A(a)$ is found, the process is continued in the consequent set; starting on the y-axis, the commonest approach is to *clip* the consequent set by truncating all membership functions with values greater than $\mu_A(a)$ to $\mu_A(a)$. This can change the relative distribution of the mass in the fuzzy consequent, thereby altering that consequent value [28].

In fuzzy logic, three types of logical operator must be chosen. First, the method of weighting multiple antecedents must be chosen. Second, the method of conferring the overall antecedent weight to the consequent variable must be chosen. Lastly, the method of combining multiple consequent variable sets must be chosen. These are described in turn.

With two or more antecedent variables, popular approaches for weighting the entire antecedent for a rule are 1) *min* and 2) *mult*. For each antecedent variable A_i , the membership grade $\mu_{A_i}(a_i)$ for its crisp value in instance a_i is calculated on the basis of its membership in fuzzy set A_i . The *min* part of the algorithm selects $\mu_{BIG} = \min_i (\mu_{A_i}(a_i))$. If using *mult*, $\mu_{BIG} = \pi_i (\mu_{A_i}(a_i))$, where π represents the product over all i . The choice of *min* or *mult* is empirical and depends on the application. In some applications, it is preferable to use *min* to reflect the most extreme case in the antecedent conditions: binary launch decisions, for example, should only be triggered if all antecedent conditions are above some minimum safety threshold. In other applications, it is preferable to use the

mult operator to reflect all antecedent conditions and not just the most extreme in the overall antecedent firing weight.

The second selection of fuzzy operator determines how the antecedent firing weight is conferred to the consequent variable. The consequent fuzzy variable is modified by the rule weight either by 1) min or 2) mult. Again the choice also depends on the applications. For min, the consequent fuzzy set is clipped at the μ_{BIG} membership function value. Since the output fuzzy set $\mu_{NEW}(b) = \min(\mu_{BIG}, \mu_B(b))$ is the minimum of μ_{BIG} and $\mu_B(b)$ at each element b in the output, this is referred to as the min step. This weighting of the consequent set may lose information regarding the distribution of the belief since the shape of the clipped portion is lost. For mult, the consequent fuzzy set is shaped by multiplication so that $\mu_{NEW}(b) = \mu_{BIG} * \mu_B(b)$. This technique retains all information regarding the distribution of belief in the consequent variable, while proportionally weighting it by the firing weight of the rule.

Lastly, a third choice of operator must be made when multiple rules create individually modified instances of the same consequent variable. These rules fire, creating multiple weighted consequent fuzzy sets for a situation, and the third choice of operator determines how to combine these weighted consequents. Two common ways of combining multiple consequent fuzzy sets are sum and max. For sum, every weighted consequent fuzzy set for a rule is added to create the overall output fuzzy set. For max, only the maximum over all the output fuzzy sets for each point becomes the overall output fuzzy variable.

The defuzzification process is the reverse of the fuzzification process. In the most popular defuzzification method, the center of mass of the consequent fuzzy set is found. The x-axis value of the center of mass becomes the defuzzified crisp value for that fuzzy set.

Combining fuzzy logic with automated learning results in *adaptive fuzzy* methods. For example, an adaptive channel hopping system for avoiding interception of radio messages is automatically calibrated to a new key code for each operation [29].

3.3.2 Integrating Multiple Learned Models

A current trend to avoid the underlying and hard-to-meet assumptions of the Bayesian approach is to learn and use information about the individual "personalities" of each method or each sensor. *Integrating Multiple Learned Models (IMLM)*, grew out of a variety of applications. Often these applications, like Aroclor interpretation or locating volcanoes on Venus [30] have no absolute truth or infallible experts on which to rely. Information characterizing the biases of the methods and experts is used to build a better final result.

Many words can be used for the same concepts, e.g. *method* or *sensor* may describe a source of input. The name BLC is used consistently throughout the rest of this paper comes from integrating multiple learned model jargon, and is derived from *Base Level Classifier* [31]. A BLC is any signal processing "box" that accepts input and returns an opinion of what is in the input. Alternatively, a BLC's "personality" is called its *performance characteristic*, a phrase less anthropomorphic than "personality". The performance characteristic includes strengths, weaknesses and unique "quirks". The

goals of integrating multiple learned models are to identify the performance characteristics of BLCs, then determine how best to combine their opinions.

Combining results has evolved from simple voting, to disagreement, to the comprehension that there is information in disagreement, and on to the automatic discovery and use of disagreements or anomalies. It is recognized that not every BLC performs correctly over the complete input domain. By observing how a BLC works in various parts of the problem space, one can over what part of the domain are its strengths and weaknesses. One can view the problem space by displaying the axes of the variables that produce performance differences in the BLCs. These identified variables form the elements of a world model called a *scenario*. To integrate multiple learned models, subdomains must be identified and BLCs evaluated for their relative effectiveness in each subdomain. Typically, a BLC has its *accuracy*: how correctly it performs, estimated in each subdomain. The collection of subdomains in which a BLC performs accurately is called the BLC's *coverage*.

One approach trained a "gateway" neural network to classify an incoming problem to a subdomain and pass it to the most qualified expert neural networks for that subdomain [32]. This noniterative method depends on clean data and complete training, solving a scaled-down version of the DIM's problem. Other work in combining results has focused on weighting combinations of regressions (by regression), also acknowledging differing behavior in different sub domains [33].

The amount of the total input space covered by a collection of BLCs is called the *coverage of the BLC set*. Ideally, the coverage of a BLC set would be the entire problem space. The degree of complementary coverage among the individual BLCs is referred to as their *diversity*. Two BLCs can have various diversity relationships in scenario space (**Figure 18**). Shaded regions indicate areas of good coverage.

Figure 18: Varying levels of diversity among BLCs

In the intelligent Combiner, each BLC is evaluated in several subdomains. The learned coverage and diversity information is used in producing a final result.

3.3.3 Anomaly Detection

Increasing lately in interest, Anomaly Detection has been applied to the detection of fraud in Medicare applications and the presence of intruders in computer systems [34]. Two general approaches exist to anomaly detection:

Consistency-based solutions check a behavior against the *usual* behaviors [35]. The main problems with this approach are 1) that a series of small, usual tasks can combine to make

an undesirable but undetectable behavior, and 2) that it is hard to state exactly what the detector is checking.

Pattern-based solutions check a behavior against a set of *known bad* behaviors. Virus checkers use this approach. So does the previously mentioned Analysis Assessment System through its symptom descriptions [36]. This approach's weakness is that only those items in the check-set are checked: novel bad behavior is not detected.

The basic assumption triggering interest in anomaly detection is that *anomalies carry information*. In combining disagreeing views or contradictions for the same sample, the focus is on anomalies. Anomalies can be revealed through either disagreement with a consistency-based consensus of averaged behavior, or through pattern-based exposure of a known relationship. The Aroclor Interpretation problem contains information, but the individual Methods' opinions cannot be combined based on statistical averaging or consistency. By using approximate pattern-checking, against automatically learned patterns, the intelligent Combiner exploits the information carried in the anomalous Method results.

4. DIM Architecture Overview

Our approach to the Aroclor Interpretation problem is one example of integrating multiple learned models. The module responsible for integrating the models is called a *Combiner*. The research presented in this paper is the development and verification of the Combiner for integrating the results of multiple trained pattern recognition Methods for Aroclor Interpretation. This mapping, illustrated in **Figure 19**, shows the Combiner's external connections to the Base Level Classifiers (BLCs), assumptions and final results.

Figure 19: Generic architecture for integrating multiple learned models

Exploiting the underlying structure of a problem space (the conditions that cause variation among the BLCs opinions) allows a Combiner to select BLCs that are most accurate for a particular input sample. However, to select appropriate BLCs, a sample's scenario must be identified. Previously published scenario-based selection of sensors relied on a human to determine the scenario values [37].

In analyzing an unknown sample, the Combiner operates in steps as shown in Figure 20. First, the DIM Combiner exploits the relative behavior of the BLCs' opinions in order to determine likely scenario(s) for the sample through the *Scenario Identification (SI) Rule Set*. Second, the Combiner uses the estimated scenarios to estimate the relative accuracy of each BLC's opinions. The DIM Combiner uses two rule sets for this step, one for each of the two questions to be answered for each Aroclor in a sample. The first question is "Is the Aroclor present in this sample?". The *Aroclor Presence (AP) Rule Set* contains the BLC-weighting rules for determining presence and absence of Aroclors. The second question, "How much of the Aroclor is present?", is harder to answer. The *Aroclor Quantification (AQ) Rule Set* describes the quantification accuracy of each BLC in each scenario. The Combiner learns these three rule sets during automated training.

Figure 20: Fuzzy Combiner architecture

The framework shown in Figure 20 is customized for any particular application by quantifying domain-specific knowledge in terms of scenario components, the scenario-identification rule set(s) and the BLC-weighting rule set(s).

The following sections describe the customized components for Aroclor Interpretation and how they are developed.

4.1 The Scenario

The scenario is a set of conditions that cause variations in the BLCs accuracies. For Aroclor Interpretation, the scenario variables are illustrated in **Figure 21** and listed below with descriptions:

- the absence or presence of specific contamination, (*Contamination Descriptor*), which ranges from Uncontaminated to Contaminated.
- the Number of Aroclors Present (*Presence Descriptor*), which can be zero (None), one (Single), or more than one (Multiple), and
- the Presence of at least one Aroclor in a concentration Above Detectable Limits (ADL) in the sample, (*Overconcentration Descriptor*), which ranges from None-Over to At-Least-1-Over.

Belief in each element is a real number between 0 and 1, inclusive. Furthermore, the sum of the belief of the elements can be greater or less than one without loss of validity.

Fuzzy logic allows the capture of belief for and against None, Single and Multiple

without having to balance belief for one with belief against another. Figure 21 shows the five continuous-scaled dimensions of the Aroclor scenario set.

Figure 21: Scenario set for Aroclor Interpretation

Scenario instances are presented as the five-tuple *Contamination Descriptor*, *None*, *Single*, *Multiple*, *Overconcentration Descriptor*. The *Presence Descriptor* values are measured independently, so that evidence can be accrued independently for each value. This is contracted to the format $C_c N_n S_s M_m O_o$ in which each subscript shows the degree of belief in the corresponding dimension. C_0 is Uncontaminated, C_1 is Contaminated; N_1 is None, S_1 is Single, M_1 is Multiple; and O_0 is None-Over while O_1 is At-Least-1-Over. For example, since the calibration standard samples are all Uncontaminated Single None-Over Aroclors, each has the scenario $C_0 N_0 S_1 M_0 O_0$.

In actual real-world scenarios, all subscripts are either one or zero, and only ten of the 32 possible scenarios occur. The remaining 22 scenario combinations are impossible due to internal contradictions: 20 specify more than 1 of {None, Single, Multiple}; and two specify both {None, At-Least-1-Over}. In *estimated* or believed scenarios, however, intermediate belief values reflect the impacts of incomplete and contradictory information.

4.2 Rule Sets For Aroclor Interpretation

To customize the DIM for Aroclor Interpretation, the Combiner rule sets must be defined.

The actual values in each rule set are learned during automated training.

4.2.1 Training

The Combiner consists of three subprocesses. Each subprocess learns during training.

The *Scenario Identification (SI)* Subprocess discovers the relationships between patterns of the Methods' opinions and a sample's membership in the possible scenarios, and stores these in the *SI Rule Set* during training.

The *Aroclor Presence (AP)* Subprocess calculates the likelihood that a present opinion is correct or incorrect based on the relative frequency of False Positives to True Positives for each Method and each scenario during training. Similarly, the likelihood that an absent opinion is correct or incorrect is calculated based on the relative frequency of False Negatives to True Negatives for each Method in each scenario. These values, called *modality confidences*, are placed into the *AP Rule Set*.

The *Aroclor Quantification (AQ)* Subprocess quantifies the average error of each quantification Method, as well as the standard deviation of their errors, in each scenario. These values are *quantification accuracies*.

4.2.2 Testing

During testing, the SI subprocess examines a suite of opinions and determines the likelihood the sample is in each of the possible scenarios based on the SI Rule Set. These

results are *scenario weights*.

During testing, the AP subprocess examines BLC opinions and determines the evidence for the absence and presence of each Aroclor. The AP step weights each Method's opinion by the modality confidence and scenario weight, and combines these weighted opinions to determine the belief in the absence and the presence of an individual Aroclor. If there is too little difference between the evidence for absence and the evidence for presence, the AP subprocess declares the result indeterminate. The indeterminate result is a flag for a human chemist to study the situation further.

During testing, the AQ subprocess summarizes the quantity information, using relative accuracies learned according to Method and scenario.

The Combiner relies heavily on training throughout all possible scenario spaces, and for each new series of batches. Laboratory practice restricts the training samples available. However, if no laboratory effort is required, the training set can be extended. The need and the method for extending the training set (and for generating testing sets) are presented in the next chapter.

5. Synthesis Of Chromatographic Data

5.1 The Need For Synthetic Data

In Section 2.5.3, the training data available for Methods and the Combiner from genuine chemistry samples was limited to only the fifteen calibration standard chromatograms. Recalling the scenario defined in Section 4.1, and the reprise of opinion classifications shown in Figure 22, each calibration standard belongs in scenario $C_0N_0S_1M_0O_0$, the Uncontaminated Single None-Over Aroclors.

Figure 22: Opinion descriptions

To investigate the behavior of Methods in the testing space beyond the training domain, synthetic chromatograms are created based on the fifteen calibration standard genuine chromatograms. Synthesis allows the addition of quantifiable specific contamination, and the examination of Aroclor quantities and multiple Aroclor combinations not included in the original testing space. The Method Training Domain, containing the fifteen genuine $C_0N_0S_1M_0O_0$ standards, is artificially extended with synthetic data to become the

Combiner training domain, which representatively, but not comprehensively, covers the Aroclor testing domain of all ten possible scenarios. This extension is done automatically, so that the Combiner can be given fifteen genuine standards for each laboratory recalibration, automatically combine these into a new synthetic training set, and retrain itself without human intervention. The following sections describe the method for constructing synthetic chromatograms from the genuine chromatograms, and show the validity of using synthetic data in this research.

5.2 Construction Method

The purpose of synthesizing chromatograms is to investigate scenario spaces beyond the Method training domain. A valid *synthetic* chromatogram must produce Method opinions comparable to equivalent *genuine* chromatograms, where available. To produce similar responses from the Methods, the physical components of the synthetic chromatogram must match the physical components of the equivalent genuine chromatogram. Synthetics must be in ample, diverse supply for adequate training and testing. To do this, a *Chromatogram Generator* randomly samples from the entire specified scenario space to produce synthetic chromatograms within a requested scenario. Figure 23 illustrates the Synthetic Chromatogram Generator and its process. First, a scenario is specified as input. Second, the Random Sampler produces a theoretical combination randomly chosen from the entire range possible for that scenario. Third, the Component List Maker translates the theoretical combination of Aroclor concentrations and contamination into a list of Components and Operations on those components. Finally, the Constructor uses elements from the Component Library, discussed in the next

section, in the combination specified by the Component and Operation List, and produces a synthetic chromatogram.

Figure 23: Synthetic Chromatogram Generator Overview

5.2.1 Physical Components Of Chromatograms

For Aroclor Interpretation, a *complete chromatogram* is a combination of four components:

- R = the retention time markers added during sample preparation and used for chromatogram normalization and content recovery measurements;

- A = Aroclor content; $A_{x,a}$ indicates Aroclor x in concentration a ; $A_{x,a,y,b}$ indicates Aroclor x in concentration a , Aroclor y in concentration b , and so forth;
- N = nonspecific contamination, including the chromatogram's baseline;
- S = the specific contamination.

Equation (10) is an algebraic representation of the components of a chromatogram C .

This algebraic view is the key to chromatogram synthesis.

$$C = R + A + N + S \quad (10)$$

Throughout the field of chromatogram interpretation it is assumed that Aroclor concentration is proportional to the strength of the corresponding GC signal throughout the calibration range. This relationship, known as Beers' Law [38], allows both automated Methods and human chemists to interpolate knowledgeably in estimating nonstandard concentrations of Aroclors. Gas chromatographs may be calibrated with linear or quadratic concentration curves. For Aroclor Interpretation, chemists have selected the linear fit. This linear relationship between concentration and signal also allows us to synthesize chromatograms through pointwise addition and subtraction of the 14,000 values in each digitized chromatogram. These synthesized chromatograms reflect the concentrations made by adding and subtracting the concentrations of their component chromatograms. Equation (11) contains the formula for creating chromatogram D , the Aroclor content of which is twice that of chromatogram C :

$$D = R + 2 * A + N + S \quad (11)$$

Equation (11) shows the importance of separating the Aroclor signal (A) from the other components R, N and S. In the DIM, each incoming chromatogram is *complete*, containing any or all of the R, A, N and S components. The complete chromatogram is passed through the DIM's *Reducer*, which approximately removes any R and N components, and produces a *reduced* chromatogram for use by the Methods. Since standards are assumed pure, without N or S contamination, a reduced standard nominally contains only the A component of the original complete chromatogram, thereby separating the Aroclor signal for use by the Constructor.

The Constructor adds and subtracts chromatogram components taken from the Component Library to make the desired chromatogram. The Component Library contains Complete Standard Chromatograms, Reduced Standard Chromatograms, and a *Noise Engine*.

The Complete Standards are the fifteen standard chromatograms of the Method Training Set, and by definition do not contain specific contamination, S. The Complete Standards, therefore, contain R, A and N Components. Reducing stretches or contracts a chromatogram to align its retention time markers with expected ones, then removes the chromatogram's baseline (the N component) and removes the retention time markers (the R component). This normalizes the chromatogram for comparison with the rest of its batch-mates and creates Reduced Standards which contain an approximation of the A signal contained in the corresponding Complete Standard Chromatogram.

Figure 24: Detail of Component Type Combination

Figure 24 shows the Constructor converting a Component and Operation List into a Synthetic Chromatogram. For illustration purposes, the List is simplified to show only Components, and all the Operations are additions.

The Component and Operation List in Figure 24 indicates that the Constructor is to create a Contaminated chromatogram containing .15 µg/ml of Aroclor 1242. The Constructor adds the complete chromatogram for Aroclor 1242 at .100 µg/ml to a reduced chromatogram for Aroclor 1242 at .050 µg/ml. The Complete Standard Chromatogram contributes R and N components, as well as $A_{1242,.100}$. The Reduced Standard Chromatogram contributes only an $A_{1242,.050}$ signal. The Noise Engine adds noise peaks,

producing a synthetic chromatogram for Aroclor 1242 at .150 µg/ml with contamination.

The Figure also notes the types of Components in the Library as well as the Synthesized Chromatogram. Of course, not only RANS, which comprise scenarios $C_1N_0S_1M_0O_0$, $C_1N_0S_1M_0O_1$, $C_1N_0S_0M_1O_0$ and $C_1N_0S_0M_1O_1$, can be generated. Adding and subtracting the Components produces all four combinations of Components:

- To create RAN (scenarios $C_0N_0S_1M_0O_0$, $C_0N_0S_1M_0O_1$, $C_0N_0S_0M_1O_0$ and $C_0N_0S_0M_1O_1$) add a Complete Standard (RAN) to as many Reduced Standards (A) as needed to obtain the desired Aroclor concentration.
- To create RANS (scenarios $C_1N_0S_1M_0O_0$, $C_1N_0S_1M_0O_1$, $C_1N_0S_0M_1O_0$ and $C_1N_0S_0M_1O_1$) create a RAN and fire the noise engine.
- To create RN (scenario $C_0N_1S_0M_0O_0$) create any RAN, then subtract Reduced Standard chromatograms (A) until the estimated Aroclor content is completely removed.
- To create RNS (scenario $C_1N_1S_0M_0O_0$) create an RN and fire the noise engine.

These four combinations of Component types create chromatograms in all ten crisp subsections of the scenario space that are legitimate for synthesizing chromatograms.

A short digression is in order to explain the seeming overkill in generating chromatograms with scenarios $C_0N_1S_0M_0O_0$ and $C_1N_1S_0M_0O_0$, the Aroclor-free chromatograms. One of the greatest limitations of the original training set is the

proportionally small number of Aroclor-free samples, with or without contamination.

Replicating these Aroclor-free samples, or any other small set of genuine chromatograms, would falsely expand the training set. Instead, when asked to produce an Aroclor-free sample chromatogram, the Synthetic Chromatogram Generator generates any possible Aroclor chromatogram, adds specific noise if so requested, and then approximately removes the Aroclor and levels the baseline.

A second note is also due. While Figure 24, and Equations (10) and (11) rely on the assumption of linearity, the algebra shown in these demonstrations is theoretical. Neither the pattern recognition Methods nor the preprocessor can perfectly separate an Aroclor signal from a chromatogram. If it were possible to ascertain exactly the amount of Aroclor signal in a chromatogram in all conditions, the Aroclor Interpretation problem would be solved directly. Thus the conclusion that a reduced chromatogram contains the sample's entire Aroclor signal and none of its baseline or retention time markers is not entirely accurate. A reduced chromatogram *approximates* the sample's entire Aroclor signal and none of its baseline or retention time markers. This approximation carries through all of the subsequent vector addition and subtraction done as the Constructor does its work.

The final note for this section details the Noise Engine. The Noise Engine generates a random number of peaks at random locations within the retention time markers to simulate Specific contamination. The ranges for the number of peaks, peak heights, and locations are set by a chemist in order to best simulate contamination. The chemist selects amplitudes of the added peaks to simulate the GC detector response to specific

contamination. The peak location range is selected so that peaks will appear within the simulated retention time of the gas chromatogram. Chromatogram signals outside the expected retention times of the target analytes are ignored, for both synthetic and genuine chromatograms. The resulting vector of synthetic specific contamination is in chromatogram format and can be added to other chromatograms. The Noise Engine is nondeterministic, so it is unrealistic to compare two Contaminated chromatograms even if their Aroclor content is the same.

5.3 Generating Diversity Without Bias

In order to generate fair training and testing data, scenario selections are passed to the Random Sampler. The Random Sampler selects randomly from concentrations, and in the case of Multiples, numbers of Aroclors, in a sample to cover the scenario space. No two passes of the Chromatogram Generator result in the same synthetic chromatograms, even if using the same Requested Scenario and Component Library. In this way, ample diverse data is produced, and the Sampler assures it is unbiased as to its position in the scenario space.

The Component List Maker translates the Theoretical Sample Contents into the Component and Operation List as shown Figure 24. The Component List Maker uses the "largest fit first" algorithm to add Aroclor concentrations from the Library Components. This algorithm stops when the total is less than the desired amount, and no more standard concentrations can be added without exceeding the desired amount. Thus, the Theoretical Sample Contents are rounded down to the nearest multiple of the lowest standard concentration, for these batches, .050 $\mu\text{g/ml}$. No singularities were observed at this

discretization granularity.

5.4 Validating The Synthetic Chromatogram Generator

To verify that the Synthetic Chromatogram Generator produces legitimate chromatograms, several synthetic batches were created and compared to genuine chromatograms of the same content. The synthetic chromatograms must produce results from the DIM Methods that are consistent with, though not necessarily identical to, those from genuine chromatograms with the same content. Two tests were performed and their results are discussed in the following section. The batches used for validation are listed below and summarized in Table 3.

- Batch 0 is a set of genuine chromatograms in the fifteen standard concentrations, created at Oak Ridge National Laboratory. The fifteen standard concentrations are 0.05, 0.10, 0.20, 0.40 and 0.80 $\mu\text{g/ml}$, for each of Aroclor 1242, 1254, 1260. These are all WDL, Single, Uncontaminated samples. All subsequent Batches used Batch 0 as the training standard.
- Batch 1 is a genuine batch created at Oak Ridge National Laboratory. It contains BDL and WDL samples, None, Single and Multiple samples, Uncontaminated and some Contaminated samples. Batch 1's standards are Batch 0. For humans, Methods, or the Combiner to interpret results from Batch 1, each must be trained on the associated standards, Batch 0.
- Batch 2 is a synthetic batch. It replicates the Batch 0 samples, therefore containing only Single, Uncontaminated WDL Aroclor samples. Several of the Batch 0 sample

compositions were synthesized in two ways, resulting in 21 samples.

- Batch 3 is a synthetic batch and is a sample-by-sample duplication of Uncontaminated samples in Batch 1. This batch contains Uncontaminated BDL, Uncontaminated Single WDL and Uncontaminated Multiple WDL samples. Contaminated samples could not be duplicated due to the random nature of the Noise Engine.

Batch number	Genuine or synthetic	Associated standards	Number of samples	Type of data	Report appendix	Scenarios included
0	genuine	(self)	15	Method training		$C_0N_0S_1M_0O_0$
1	genuine	Batch 0	75	Method testing		$C_0N_0S_1M_0O_0$ $C_1N_0S_1M_0O_0$ $C_0N_1S_0M_0O_0$ $C_1N_1S_0M_0O_0$ $C_0N_0S_0M_1O_0$ $C_1N_0S_0M_1O_0$
2	synthetic	Batch 0	21	synthesis validation	C	$C_0N_0S_1M_0O_0$
3	synthetic	Batch 0	54	synthesis validation	D	$C_0N_0S_1M_0O_0$ $C_0N_1S_0M_0O_0$ $C_0N_0S_0M_1O_0$

Table 3: Batch descriptions

The batch composition of each validation batch and the results of each validation test are discussed next. From these tests we conclude that synthesis creates legitimate chromatograms.

5.4.1 Validation Of Batch 2

The Component List for Batch 2 is generated manually, to synthesize the 21 desired chromatograms for Batch 2, using Batch 0. To obtain chromatograms of precise content

for validation, the Random Sampler and Component List Maker of Figure 23 are bypassed. Twelve synthetics are of the four highest standard concentrations of the three Aroclors, created by using a Complete Standard and a Reduced Standard each containing half the desired Aroclor concentration. The remaining nine synthetics are of the three highest standard concentrations of the three Aroclors. They are created by using a Complete Standard containing half the desired Aroclor concentration and 2 Reduced Standards each containing one quarter of the desired Aroclor concentration. The chromatograms and their formulas are shown in Table 4. The resulting synthetics are passed through the DIM's preprocessor and Methods. The Method results are plotted and compared to the results of the genuine chromatograms.

Genuine and Synthetic Chromatograms are named as follows:

Type(1242,*a*,1254,*b*,1260,*c*,Contamination_value,id)

Type is either *Syn* or *Gen*; *a*, *b* and *c* represent the concentration of their respective Aroclors, and Contamination_value is 1 if the chromatogram is contaminated, zero otherwise. An Aroclor and its concentration may be omitted if the concentration is zero.

Id is an arbitrary unique identifier for the chromatogram, used to distinguish chromatograms with nominally the same content.

Syn(1242,100,1001) = *Gen*(1242,050,001) Complete + *Gen*(1242,050,001) Reduced
Syn(1242,200,1002) = *Gen*(1242,100,002) Complete + *Gen*(1242,100,002) Reduced
Syn(1242,400,1003) = *Gen*(1242,200,003) Complete + *Gen*(1242,200,003) Reduced
Syn(1242,800,1004) = *Gen*(1242,400,004) Complete + *Gen*(1242,400,004) Reduced
Syn(1254,100,1005) = *Gen*(1254,050,006) Complete + *Gen*(1254,050,006) Reduced
Syn(1254,200,1006) = *Gen*(1254,100,007) Complete + *Gen*(1254,100,007) Reduced
Syn(1254,400,1007) = *Gen*(1254,200,008) Complete + *Gen*(1254,200,008) Reduced
Syn(1254,800,1009) = *Gen*(1254,400,009) Complete + *Gen*(1254,400,009) Reduced

$Syn(1260,100,1009) = Gen(1260,050,011) \text{ Complete} + Gen(1260,050,011) \text{ Reduced}$
 $Syn(1260,200,1010) = Gen(1260,100,012) \text{ Complete} + Gen(1260,100,012) \text{ Reduced}$
 $Syn(1260,400,1011) = Gen(1260,200,013) \text{ Complete} + Gen(1260,200,013) \text{ Reduced}$
 $Syn(1260,800,1012) = Gen(1260,400,014) \text{ Complete} + Gen(1260,400,014) \text{ Reduced}$
 $Syn(1242,200,1013) = Gen(1242,100,002) \text{ Complete} + 2 * Gen(1242,050,001) \text{ Reduced}$
 $Syn(1242,400,1014) = Gen(1242,200,003) \text{ Complete} + 2 * Gen(1242,100,002) \text{ Reduced}$
 $Syn(1242,800,1015) = Gen(1242,400,004) \text{ Complete} + 2 * Gen(1242,200,003) \text{ Reduced}$
 $Syn(1254,200,1016) = Gen(1254,100,007) \text{ Complete} + 2 * Gen(1254,050,006) \text{ Reduced}$
 $Syn(1254,400,1017) = Gen(1254,200,008) \text{ Complete} + 2 * Gen(1254,100,007) \text{ Reduced}$
 $Syn(1254,800,1018) = Gen(1254,400,009) \text{ Complete} + 2 * Gen(1254,200,008) \text{ Reduced}$
 $Syn(1260,200,1019) = Gen(1260,100,012) \text{ Complete} + 2 * Gen(1260,050,011) \text{ Reduced}$
 $Syn(1260,400,1020) = Gen(1260,200,013) \text{ Complete} + 2 * Gen(1260,100,012) \text{ Reduced}$
 $Syn(1260,800,1021) = Gen(1260,400,014) \text{ Complete} + 2 * Gen(1260,200,013) \text{ Reduced}$

Table 4: Component and Operation List for Batch 2 Synthetics

Figures illustrating the synthetics under construction are shown in Appendix A. These figures show each synthesized chromatogram as well as its foundation genuine chromatogram and the signal(s) added during synthesis.

Synthesis is validated graphically and numerically. Each synthesized chromatogram is graphed in comparison with the genuine chromatogram containing the same Aroclor in nominally the same concentration. These figures are in Appendix B. Each synthesized chromatogram and a genuine chromatogram with the same Aroclor content are shown individually, along with their point-by-point difference. The difference plot rises above zero when the genuine chromatogram's amplitude is larger than the synthetic's amplitude for the same retention time data point. The difference plot dips below zero when the genuine chromatogram's amplitude is less than the synthetic's.

Numerical results of Method performances on the genuine chromatograms and their synthetic duplicates are shown in Appendix C.

5.4.1.1 Validation By Quantitative Methods

There are three *judgements* made for each sample, one judgement for each Aroclor. Since all 21 samples in Batch 2 contain only one Aroclor each, there are 21 Aroclor-containing judgements and 42 judgements containing zero Aroclors.

Absent-Aroclor judgments. Figure 25 shows the arithmetic difference between performances on synthetic and genuine chromatograms by the Methods on judgements containing zero Aroclors. This figure demonstrates the ability of a Method to recognize the absence of an Aroclor in a sample containing another Aroclor, showing the Methods' imperviousness to bleedover. Bleedover from a present Aroclor into an absent Aroclor's signal range may cause incorrect reports by Methods.

Figure 25: Batch 2 summary of zero-Aroclor judgements

For each Method, the differences in the Methods' opinions between synthetic and genuine zero-Aroclor judgments are sorted into increasing order. MLR's opinions on synthetic zero-Aroclor judgements identically match its opinions on the corresponding judgement in a genuine standard. The negative arithmetic difference for NN indicates the Method gives non-BDL opinions for some zero-Aroclor judgements on genuine standards while giving BDL opinions for the corresponding judgement in the corresponding synthetic chromatogram. NN and PCR overestimate some of the judgements, all by less than .06 $\mu\text{g/ml}$.

PA's apparently poor performance in terms of arithmetic difference is due to large bleed-overs. NN, PA, and PCR are susceptible to "bleeding-over", which is falsely reporting

the presence of an absent Aroclor when another Aroclor is present in a sample.

PA's performance on zero-Aroclor judgements on the synthetic chromatograms of Batch 2 parallels its profile of performance on the corresponding genuine judgements, shown in Figure 26. The values are sorted pair-wise by judgment, in order of increasing difference between an opinion for the synthetic chromatogram and the opinion for the corresponding genuine judgment. PA's opinions on the synthetics are higher but correlated to its opinions on the genuine chromatogram judgements. PA's tendency toward producing False Positives, including extreme False Positives due to bleed-over does not invalidate the synthetic chromatograms. The error is extreme for both the synthetics and genuine chromatograms.

Figure 26: Batch 2 PA performance on synthetics parallels its performance on genuine zero-Aroclor judgements

Quantification of Present Aroclors. Figure 27 - Figure 30 display, for each quantification Method, the judgments for synthetic and genuine chromatograms containing Aroclors. Data for each figure is sorted pair-wise by judgment, in order of increasing known concentration, then in order of increasing difference.

Opinions on synthetic and genuine chromatograms correlated well for all four quantitative Methods. MLR, NN, and PCR opinions on synthetics are higher or equal to their opinions on the corresponding genuine judgement. PA's opinions for synthetics are sometimes lower, and sometimes higher or equal to, their opinions for the judgement's genuine counterpart.

Figure 28: NN Performance on Batch 2 (Synthetic) and Batch 0 (Genuine) Aroclor-containing judgments

Figure 29: PA Performance on Batch 2 (Synthetic) and Batch 0 (Genuine) Aroclor-containing judgments

Figure 30: PCR Performance on Batch 2 (Synthetic) and Batch 0 (Genuine) Aroclor-containing judgments

The quantification Methods show performances on synthetic chromatograms that are consistent with their performances on corresponding genuine chromatograms. The fifth Method, NNI, reports a probability that a given Aroclor is present, rather than a quantification estimate and its performance is discussed next.

5.4.1.2 Validation By Identification Method

NNI's performance on Batch 2 is shown in Figure 31. Probabilities < 40% indicate No Aroclor is present, probabilities above 70% indicate Yes, the Aroclor is present, and intermediate probabilities signify that NNI is unable to determine absence or presence of

the Aroclor in question, called Maybe. All judgements that were scored as Yes on the genuine chromatogram are scored as Yes on the corresponding synthetic chromatogram. Similarly, for all No judgments by NNI for the genuine chromatograms, the corresponding synthetic chromatogram scores No. For Batches 0 and 2, NNI reports no Maybes from either synthetic or genuine chromatograms. NNI's performance on synthetic chromatograms is thus consistent with its performance on genuine chromatograms.

Figure 31: Batch 2 NNI performance on synthetics parallels its performance on genuine judgements

While Method performances on synthetic chromatograms in Batch 2 do not exactly match

the Method performances on the corresponding genuine chromatograms, the Methods produce opinions that are sufficiently similar to consider these synthesized chromatograms valid for training and testing the Combiner. More validation is needed outside the domain of Batch 2, which contained only a few Uncontaminated Single None-Over Aroclors. In the next section, a more diverse synthetic Batch is discussed and found valid.

5.4.2 Validation Of Batch 3

Batch 3 consists of 54 synthetic chromatograms, the composition of which duplicate the composition of the 54 Uncontaminated genuine chromatograms in Batch 1. For all Methods, the performance on the synthetic Aroclor-free samples (None), Single and Multiple Aroclors of Batch 3 is consistent with performance on the corresponding genuine chromatograms of Batch 1. This section describes the composition and generation of these synthetics and shows the validity of using synthetics instead of genuine chromatograms in all scenarios that can be replicated.

To obtain chromatograms of precise content for validation, the Random Sampler is bypassed. Batch 1 contains 22 contaminated genuine chromatograms in scenarios $C_1N_1S_0M_0O_0$, $C_1N_0S_1M_0O_0$ and $C_1N_0S_0M_1O_0$. These remaining contaminated samples from Batch 1 are not duplicated in Batch 3 since the nondeterministic injection of noise into the synthetics is unable to precisely reproduce the contamination present in Batch 1 samples. Batch 1's Aroclor signals are all WDL (None-Over), therefore the ADL scenarios ($C_0N_0S_1M_0O_1$, $C_1N_0S_1M_0O_1$, $C_0N_0S_0M_1O_1$ and $C_1N_0S_0M_1O_1$) are not represented in Batch 3 either.

The three scenarios represented in Batch 3 are $C_0N_1S_0M_0O_0$, $C_0N_0S_1M_0O_0$ and $C_0N_0S_0M_1O_0$. Each is described in turn as results are first given for quantification methods, then for the identification method.

5.4.2.1 Validation By Quantification Methods

Aroclor-free samples. The first scenario represented in Batch 3 is $C_0N_1S_0M_0O_0$, the Uncontaminated Aroclor-free samples. Deliberate randomness in the Generator's method slightly varies the empty tests without changing their $C_0N_1S_0M_0O_0$ character. Method performances on synthetic chromatograms are compared to performances on the genuine blanks in Batch 1 and are shown in Figure 32. All Methods worked identically on synthetic and genuine chromatograms in $C_0N_1S_0M_0O_0$ for Batch 3. Note that since all values are zero, those for MLR and PA are hidden behind other values on the graph. This precise performance is due to the absence of *any* Aroclor signal in the chromatogram, so there is no possibility for bleedover to confuse a Method into producing a non-zero opinion.

Figure 32: Batch 3 summary of performances on genuine and synthetic judgements in $C_0N_1S_0M_0O_0$ (MLR and PA results hidden behind NN and PCR values)

Samples containing a single Aroclor. The second scenario represented in Batch 3 is $C_0N_0S_1M_0O_0$, an Uncontaminated Single None-Over Aroclor. Figure 33 - Figure 36 show each Method's performance on genuine and synthetic chromatograms in $C_0N_0S_1M_0O_0$. Data for each of these figures is sorted, pair-wise by judgment, in order of increasing known concentration. The values for synthetic chromatograms are consistent with the values produced for genuine chromatograms for all Methods. This concurs with performances on Batch 2, all samples of which were in this scenario.

Figure 33: MLR Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing a single Aroclor $C_0N_0S_1M_0O_0$

Figure 35: PA Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing a single Aroclor $C_0N_0S_1M_0O_0$

Figure 36: PCR Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing a single Aroclor $C_0N_0S_1M_0O$

Samples containing multiple Aroclors. The final scenario in Batch 3 is $C_0N_0S_0M_1O_0$.

The performance on synthetic chromatograms in $C_0N_0S_0M_1O_0$ by each quantitative Method correlated well to its performances on the corresponding genuine judgements, shown in Figure 37 - Figure 40.

Figure 37: MLR Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing multiple Aroclors $C_0N_0S_0M_1O_0$

Figure 38: NN Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing multiple Aroclors $C_0N_0S_0M_1O_0$

Figure 39: PA Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing multiple Aroclors $C_0N_0S_0M_1O_0$

Figure 40: PCR Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing multiple Aroclors $C_0N_0S_0M_1O_0$

The quantification Methods show sufficient consistency in interpreting synthetic, compared to genuine, chromatograms to consider the synthetics valid.

5.4.2.2 Validation By Identification Method

The identification Method also shows this validity. The three scenarios are presented and discussed next for NNI.

Figure 41 shows that all blank synthetic and genuine chromatograms received No reports from NNI, indicating it found no Aroclors present.

Figure 41: NNI Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples that contain no Aroclors $C_0N_1S_0M_0O_0$

NNI performed similarly on synthetic and genuine chromatograms in $C_0N_0S_1M_0O_0$.

Figure 42 shows that two synthetic judgements received weak Yes (~ 73%) scores while their genuine counterparts received weak No (28%, 38%) scores, while the classification of every other synthetic remains the same as that of its genuine counterpart.

Figure 42: NNI Performance on Batch 3 (Synthetic) and Batch 1 (Genuine) for judgments on samples containing a single Aroclor $C_0N_0S_1M_0O_0$

NNI's performance in $C_0N_0S_1M_0O_0$ is shown in Figure 43. Notably, several weak No and weak Yes scores slip into Maybe classification, while their numerical scores still reflect correspondence between the synthetic judgement and the genuine judgement.

holds, as expected by Beers law [38], when synthesizing At-Least-1-Over samples. This approach was due to the unavailability of overly-concentrated samples in the genuine sample sets. Batch 5 is the Combiner Training Set (CTS), and Batches 6 and 7 are used to test the Combiner. Batches 5, 6 and 7 are described in later sections. Appendices C, D, E, F, G and H contain the numerical reports from Batches 2, 3, 4, 5, 6, and 7, respectively.

Batch number	Genuine or synthetic	Associated standards	Number of samples	Type of data	Report appendix	Scenarios included
0	genuine	(self)	15	Method training		$C_0N_0S_1M_0O_0$
1	genuine	Batch 0	75	Method testing		$C_0N_0S_1M_0O_0$ $C_1N_0S_1M_0O_0$ $C_0N_1S_0M_0O_0$ $C_1N_1S_0M_0O_0$ $C_0N_0S_0M_1O_0$ $C_1N_0S_0M_1O_0$
2	synthetic	Batch 0	21	synthesis validation	C	$C_0N_0S_1M_0O_0$
3	synthetic	Batch 0	54	synthesis validation	D	$C_0N_0S_1M_0O_0$ $C_0N_1S_0M_0O_0$ $C_0N_0S_0M_1O_0$
4	synthetic	Batch 0	200	synthesis validation	E	$C_0N_0S_1M_0O_0$ $C_0N_0S_1M_0O_1$
5	synthetic	Batch 0	200	Combiner training	F	all
6	synthetic	Batch 0	399	Combiner testing	G	all
7	synthetic	Batch 0	400	Combiner testing	H	all

Table 5: Batch descriptions

Batch 6 contains one less sample than expected. Sample 243ftest, scenario $C_1N_0S_0M_1O_1$, caused MLR to stall in the “check” iteration step. Because of this bug in MLR, the sample was removed.

6. DIM Architecture and Components

Recall that the Combiner overview shown in Figure 20 includes the Scenario Identification (SI) step, which uses the learned SI Rule Set; the Aroclor Presence Detection (AP) step, which uses the learned AP Rule Set; and the Aroclor Quantification (AQ) step, which uses the learned AQ Rule Set. This section presents the development and use of the SI, AP and AQ Rule Sets.

6.1 Scenario Identification Rules

The goal of Scenario Identification is to determine, for each scenario, the degree of belief that the test sample is in that scenario. To do this, the SI process must translate Method opinions into crisp classes in order to learn rules relating opinion patterns to scenarios. Each Method opinion for a test sample is matched against each SI rule, to determine to which scenarios it may belong.

The Combiner's SI subprocess automatically learns and classifies samples into scenarios in a way superior to Multicategory Classification (MCC). The Combiner automatically learns relationships, linear or otherwise, between opinion patterns and scenario membership, making it superior to published human-dependent classifiers [37].

Furthermore, it can approximately fit a test sample into as many scenarios as it needs, meaning that it can work on sparse, representative training. This makes the Combiner superior to published neural network classifiers [32].

Before the sections explain the training, testing and performance of the SI subprocess, the

next section shows the basis for relating patterns of opinions to scenarios.

6.1.1 Visualizing Scenarios As Patterns Of Opinions

The Combiner identifies the possible scenarios for a test sample by examining the Method opinions for the sample. Recognizing patterns in these opinions is the key to identifying a test sample's scenario. Two ways to visualize these patterns of relationship are shown in Figure 44, showing five opinions regarding one Aroclor in a test sample.

Figure 44: Demonstration of Line Chart and Radar Plot Formats

A set of Method opinions for an individual Aroclor in a test sample is shown in traditional line chart format on the left of the figure. In the line chart, the x-axis serves only to separate the views by Method. The y-axis measures the strength of each view. Another way to show multiple views of the same sample is called a *radar plot*, as demonstrated on the right side of Figure 44.

Analogous to a polar coordinates system, a radar plot is formed by compressing the x-axis into a single point, radiating a spoke from this origin for each Method and mapping each

opinion on a separate spoke. For example, the vertical spoke in the radar plot in Figure 44 shows MLR's opinion. The radar plot illustrates all five Method opinions and creates a spatial view of the relationships among the opinions. On this plot the peculiarities of relative Method behaviors become vivid. In the next subsection, the entire Combiner Training Set (CTS) is shown in this revealing format.

6.1.1.1 The Combiner Training Set

The five Methods examine a test sample and produce a set of five opinions for each of the three individual Aroclors.

The Combiner Training Set (CTS) for the ten legitimate scenarios is shown in Figure 45a and Figure 45b. The CTS plots are laid out on the page to reflect the axes of the scenario space. These three axes are:

- the *Contamination* axis, with values ranging between Contaminated and Uncontaminated
- the *Presence* axis, with values in degrees of None, Single, and Multiple
- the *Overconcentration* axis, with values ranging between None-Over, and At-Least-1-Over, reflecting the presence of at least one Aroclor that is ADL.

The CTS plots are separated first by *Contamination*. The five CTS plots in Figure 45a are Uncontaminated. The five in Figure 45b correspond position-to-position to their Figure 45a counterparts, but are Contaminated.

Within each Figure, the plots are presented from left to right in *Presence* order (None, Single and Multiple) and from top to bottom in *Overconcentration* order (None-Over and At-Least-1-Over).

The plots in these figures have been normalized in scale to one another to allow direct comparison. Exact values are not as important as the pattern's shape.

Figure 45a: The Combiner Training Set for Uncontaminated scenarios

Figure 45b: The Combiner Training Set for Contaminated scenarios

Each scenario contains 20 test samples. Each sample is analyzed for three individual Aroclors. Thus, each radar plot in Figure 45 is composed of 60 sets of opinions in the given scenario. The aggregate “shape” formed by this composition gives a snapshot of the relative Method behaviors in the scenario. Remarkably obvious separation occurs when viewing radar charts for the ten legitimate scenarios.

Figure 45 reveals the key to scenario identification, which is analyzing patterns of the ways Methods respond in different scenarios. One example of a pattern is the “spike” formed by PA in scenarios containing multiple Aroclors. Features such as PCR’s spike in three but not the fourth At-Least-1-Over scenario make it impossible to manually extract rules from these plots. Thus, the Combiner needs automated learning techniques in order

to 1) solve the Aroclor Interpretation problem and 2) provide a general purpose IMLM combiner. To use this information with an unknown sample, its information (like that shown in the radar plot of Figure 44) is compared to the information shown in Figure 45. By matching the unknown's shape to the CTS shapes, the Combiner estimates a degree of belief for each legitimate scenario. This degree of belief reflects the belief that the unknown sample could belong in the given scenario.

6.1.2 Training The SI Subprocess

The Combiner automatically learns the information shown in the radar plots of Figure 45. For each CTS sample, this information ties the pattern of opinions to the known scenario. Each CTS sample produces five opinions for each of the three Aroclors. Then, the following steps occur to train the SI Subprocess:

- Translation. The Combiner automatically translates the fifteen numerical opinions into crisp classifications.
- Ordering. The Combiner places the classified opinions into a certain order. This creates a pattern of opinions.
- Counting. The Combiner counts the number of times each pattern is seen in each scenario. These counts, with their associated patterns, are stored as SI rules.

The rest of this section describes the training of the SI subprocess in detail.

Translation. The Combiner automatically translates the fifteen numerical opinions into crisp classifications. While Figure 45 uses the continuously valued opinions, the SI subprocess quantizes the opinions to form discrete rules, (later, the use of fuzzy logic returns the SI subprocess to a continuous information domain). The Combiner puts each CTS opinion in a category. Quantity opinions translate to the categories BDL, WDL and ADL. Identity opinions correspond to the categories No, Maybe, or Yes. Categorizing the opinions reduces the infinite space based on the continuous opinion values to only 3 possible values for each of the fifteen opinions. This still creates 3^{15} possible divisions of the opinion space, but this is remarkably more tractable. Figure 46 recalls the crisp quantity classifications originally presented in Subsection 2.4.1. Additionally, the Combiner clamps quantities above 4.0 $\mu\text{g/ml}$ at 4.0 $\mu\text{g/ml}$. Figure 46 also shows the crisp identity classifications originally discussed in Subsection 2.4.2.

Figure 46: Crisp Quantity and Identity Classifications

Ordering. The Combiner places the classified opinions into a certain order, which creates a pattern of opinions. Appendix I shows the patterns of opinions in the Rules. The

sequence of the opinions changes only by Aroclor, not by Method. Thus, for five opinions for one Aroclor, they stay in the sequence shown in the example: MLR, NN, PCR, PA, NNI. The Combiner rearranges the Aroclor sequence in order to exploit symmetries in the training patterns.

Fortunately, scenario classification does not depend on the identity of an individual Aroclor. This means that a sample with one WDL uncontaminated Aroclor produces a pattern homologous to another sample with a different WDL uncontaminated Aroclor. By switching the Aroclor order of the opinions, the second pattern matches the first. The second pattern is a *homologue* of the first. For each set of homologues, the one with the lowest sorted order from left to right is arbitrarily designated as the primary homologue and used for the SI rule set.

Two hundred CTS samples produced 127 primary homologues. Exploiting this minor issue reduces the number of rules by reducing the number of antecedent patterns (from 3^{15}), and, more importantly, allows the matching of a test sample to a homologue, rather than to an identical match, in the training set. Mapping homologues to a representative case increases the chances of matching a test sample's pattern to one of the patterns seen in the CTS, that is, the SI rule set. As shown later, identifying partial matches is critical to the SI subprocess.

Counting. The Combiner counts the number of times each pattern is seen in each of the 10 legitimate scenarios in order to produce the 10 consequents for each SI rule. The consequents of each rule are the *learned likelihoods of membership* in each scenario for

the antecedent pattern. The learned likelihood of membership in a scenario is the number of times the pattern appeared in that scenario. The complete set of 127 SI rules, each with fifteen antecedents and ten consequents, appears in Appendix I.

6.1.3 Testing the SI Subprocess

After the Methods analyze a test sample, they produce fifteen opinions. Then, the following steps occur to identify the scenario for a test sample:

- Ordering. The Combiner places the opinions into their best-fit homologue order.
- Translation. The Combiner translates each of the fifteen numerical opinions into three fuzzy values.
- Rule matching. The Combiner computes the degree of match between the test sample's pattern and each pattern in the SI rule set.
- Matched rule summing. The Combiner weights, then sums the consequents of all the matched rules. This produces ten composed consequents, one for each scenario. Each contains the likelihood that the test sample is in that scenario. *Scenario weight* is another name for this likelihood. A scenario with a heavy scenario weight is more likely than a scenario with a small scenario weight.

The rest of this section describes in detail how SI analyzes a test sample.

Ordering. The SI subprocess places the opinions into their primary homologue sequence.

The Combiner translates the fifteen numerical opinions into the crisp classifications, exactly as done in SI training. These crisp classifications are only used to sort them (or for explaining the Combiner's results), into their primary homologue order. The Combiner rearranges the continuous-valued opinions into this new order. Due to limitations of crisp classifications, especially near class boundaries, a test sample's primary homologue may not exactly match the ordered training data. This best-fit approach maximizes the usability of the sparse, representative training data.

Translation and Rule matching. Using the reordered numerical opinions, the Combiner matches the test sample's pattern to each pattern in the SI rule set. Figure 47 illustrates this process. On the left, each pattern of opinions that is seen in the CTS is converted to its primary homologue and listed as an antecedent. On the right, the possible scenarios are listed. Between these sets, a weighted line from each pattern to associated scenarios are listed. Between these sets, a weighted line from each pattern to associated scenarios shows the frequency with which that pattern is found in the corresponding scenario in the CTS.

Figure 47: Demonstration of antecedent mismatches for SI

In order to match a test sample's pattern to the learned patterns, the SI subprocess depends critically on fuzzy logic. Two cases demonstrate the power of, and the need for, using fuzzy logic in matching test samples to the rule antecedents.

Case 1: Without fuzzy logic, all samples with Pattern X are assigned the heavier-likelihood Scenario 1 and never Scenario 2. With fuzzy logic, samples with Pattern X are assigned Scenario 1 with likelihood "6" and Scenario 2 with likelihood "5". Fuzzy logic retains information about the proper possibilities, and their relative weights, for use in further reasoning.

Case 2: Without fuzzy logic, all test samples with pattern A – not seen in the training set – are unclassifiable. With fuzzy logic, if Pattern A matches Pattern Z to "z" extent and Pattern Y to "y" extent, a test sample with Pattern A will be assigned with $"z" * 3$ likelihood to Scenario 3 and $"y" * 1$ likelihood to Scenario 2. The factors "3" and "1" in these calculated likelihoods reflect the learned frequency that Pattern Z belonged to Scenario 3, and Pattern Y belonged to

Scenario 2, respectively, in the example from Figure 47. Equation (12) shows the composition of likelihood for one scenario i for a test sample with pattern p . This equation uses two functions:

- $rule_match(p, j)$, which measures the degree to which pattern p matches the antecedent pattern of rule j , shown as “y” and “z” in Figure 47,
- $learned_likelihood(j, i)$, the learned likelihood that the antecedent of rule j belongs to scenario i , shown as “1” and “3” in Figure 47.

Again, fuzzy logic retains information about the proper possibilities, and their relative weights, for use in later reasoning.

$$likelihood(p, i) = \sum_{all\ j} rule_match(p, j) * learned_likelihood(j, i) \quad (12)$$

The $rule_match$, also called the *rule firing weight*, is shown in Equation (13).

Each antecedent rule match is shown in the equation as $element_match(p_k, j_k)$ for antecedent k of the rule j and opinion k of test sample pattern p . The $element_match$ is produced for every opinion in the test sample and its corresponding antecedent in the rule; the product of these for all fifteen opinion-antecedent element pairs becomes the $rule_match(p, j)$. The $rule_match(p, j)$ is a fuzzy number summarizing the degree to which rule j resembles the pattern p of the test sample.

$$rule_match(p, j) = \prod_{all\ k} element_match(p_k, j_k) \quad (13)$$

6.1.3.1 Preliminary Fuzzification

Recall that a test sample with pattern p has fifteen numerical values, placed into a particular order. Call the index into these fifteen numerical values k . Recall also that any SI Rule, referred to by its unique number j , also has fifteen elements in a particular order, but that these refer to fuzzy sets. The $element_match(p_k, j_k)$ is the degree that the value of opinion p_k belongs to the fuzzy set specified by j_k . Fuzzy variables define the $element_match$ of Equation (13). Figure 48 displays the preliminary definition of the fuzzy quantity variables. The finished definition will be developed by the end of this section. The Combiner replaces quantity values greater than 4 $\mu\text{g/ml}$ with 4 $\mu\text{g/ml}$.

Figure 48: Fuzzy Quantity Classifications (preliminary definition)

For example, let a test sample with pattern p have a quantity opinion of .035 $\mu\text{g/ml}$ in its k th position. By the fuzzy logic techniques detailed in 3.3.1, the value .035 $\mu\text{g/ml}$ classifies fuzzily as .4 BDL, .5 WDL and 0 ADL. Now, assume that the SI rule numbered j has the set BDL in position k . The value p_k (.035 $\mu\text{g/ml}$) matches j_k (BDL) to the .4 degree, producing $element_match(p_k, j_k)$ of .4. The $rule_match(p, j)$ between test sample

with pattern p and SI rule number j is the product of all k $element_match(p_k, j_k)$, as shown in Equation (13). Figure 49 shows this process of determining $element_match$ and $rule_match$ values for a test sample pattern and a few rules. This example does not use real SI rules or a real test sample, but rather is constructed to show the mechanics of the SI process.

																	<u>mult</u>
Method opinions	0	0	0	0	0	0	0	0	.035	0	.4	.4	.4	.4	1		
Rule 1	B	B	B	B	N	B	B	B	W	N	W	B	W	W	Y		
Firing weights	1	1	1	1	1	1	1	1	.5	1	1	0	1	1	1	0	
Rule 2	B	B	B	B	N	B	B	B	B	N	W	W	W	W	Y		
Firing weights	1	1	1	1	1	1	1	1	.4	1	1	1	1	1	1	.4	

Figure 49: Weighting an SI rule for a test sample using preliminary definition of the classifications

Matched rule summing. The consequents of a fired rule are weighted (multiplied) by the rule firing weight. The weighted consequents of all the fired rules are summed. This produces a composed likelihood for each of the ten possible scenarios. Figure 50 continues the example from Figure 49 and shows how consequents are summed. In this example, the composition is arithmetic for clarity. In the Combiner, the consequents are fuzzy sets which are weighted by the rule firing weights and summed into a single two-dimensional set per scenario. The composed likelihoods shown in Figure 50 can be interpreted as "The test sample is most likely in Scenario 3, but also shows evidence of Scenario 2. Scenario 1 is not out of the question, and Scenario 4 is unlikely."

<i>Rule Number (j)</i>	<i>SI Rule</i>				<i>Rule match (firing weight) for Sample p and Rule j</i>
	<i>Likelihood in Scenario 1</i>	<i>Scenario 2</i>	<i>Scenario 3</i>	<i>Scenario 4</i>	
Rule 1	0	1	3	3	0
Rule 2	1	0	1	0	.4
Rule 3	0	0	3	0	.3
Rule 4	0	1	0	0	1
Composed likelihood that Sample p is in Scenario i	.4	1	1.3	0	

Figure 50: Composing SI consequents for a test sample using rough definition of the classifications

6.1.3.2 Refinements To Fuzzification

The preliminary definitions explain the basic approach, however there are two details that need further elaboration: the handling of zeros in element matches, and in justifying the choice of mult in composing the rule match from the element matches.

Zero representation. The training set is sparse, so near-misses are likely. Figure 49 shows a near-miss between the test sample and Rule 1. Fourteen of the fifteen opinions positively match the corresponding rule antecedents, and one matches to zero degree – indicating that it does not match, making the test sample a near-miss in matching Rule 1. But a near-miss should not be unclassifiable. The term near-miss is not rigorously defined. Recall that there are 127 rules and patterns, but 3^{15} theoretically possible patterns. Observing the low number of samples per pattern (200 samples producing 127 patterns), encountering test patterns not seen in the CTS is likely. In cases where no rule matches a test sample exactly, instead of failing to classify the test sample, the Combiner

identifies the closest match. Closest matches come from the near-misses.

Figure 51 shows the finished version of the fuzzy quantity and identity classifications.

These differ from the preliminary definition in that there is always some positive membership in every set for any quantity or identity value.

Figure 51: Fuzzy Quantity Classifications (finished definition)

According to the finished definition, $.4 \mu\text{g/ml}$ belongs .001 degree to the set BDL, rather than zero degree (unmatched) in the preliminary definition. Figure 52 shows the impact of the finished definitions of the classifications. The near-miss membership degree (".001") is defined to be much smaller than the amount of even a partial match. This ensures that any rule without misses will outweigh a rule with misses.

	mult														
Method opinions	0	0	0	0	0	0	0	0	.035	0	.4	.4	.4	.4	1
Rule 1	B	B	B	B	N	B	B	B	W	N	W	B	W	W	Y
Preliminary Firing weights	1	1	1	1	1	1	1	1	.5	1	1	0	1	1	1
Improved Firing weights	1	1	1	1	1	1	1	1	.5	1	1	.001	1	1	1
															.0005

Figure 52: Weighting an SI rule for a test sample using finished definitions of the classifications

Combining Function. The use of **mult** instead of **min** to combine the antecedent firing weights reflects the number of misses. Figure 53 compares two rules, one with one near-miss and the second with two near-misses, under **mult** and **min**. Using **min** obscures the number of misses. Using **mult** reflects the difference, by orders of magnitudes, between the relative strengths of the overall match of the test sample to Rule 1 and to Rule 11. Considered in the extreme, a rule with fifteen misses scores the same under **min** as a rule with only one miss—this is unacceptable. Thus, Scenario Identification uses **mult** to combine the weights of the antecedents in the SI rules.

	mult															min
Method opinions	0	0	0	0	0	0	0	0	.035	0	.4	.4	.4	.4	1	
Rule 1	B	B	B	B	N	B	B	B	W	N	W	B	W	W	Y	
Firing weights	1	1	1	1	1	1	1	1	.5	1	1	.001	1	1	1	.0005
Rule 11	A	A	B	B	N	B	B	B	B	N	W	W	W	W	Y	
Firing weights	.001	.001	1	1	1	1	1	1	.4	1	1	1	1	1	1	.0000004
																.001

Figure 53: Motivation for using **mult** instead of **min** for weighting SI rules

6.1.4 SI Performance Results

The Scenario Identification subprocess trains on the CTS (Batch 5), which contains 20 synthetic samples in each of ten scenarios. The Combiner learned 127 rules, shown in Appendix I. In analyzing a test sample, the Combiner produces both scenario weights and *context*.

Scenario weights. The competing technique was Multicategory Classification (MCC), discussed previously in section 3.2.1. Two techniques are scored – the Combiner and MCC. MCC is selected because no special conditions are required of the data. Each classification is measured in the five scenario dimensions of C, N, S, M, O. Three types of score are possible: correct, training error and misclassification.

MCC errors scored as training error or misclassification. MCC could not separate all the scenarios in training. There is no guarantee that MCC was optimally training, however, as the training classes are defined manually. MCC automatically iterates until separation is achieved or the iteration limit surpassed, but it cannot declare a space inseparable.

MCC would not separate Batch 5 in 90,000 iterations with $C_1N_0S_1M_0O_0$ and $C_1N_0S_0M_1O_0$ defined as separate classes. MCC would not separate Batch 5 in 90,000 iterations with $C_1N_0S_1M_0O_1$ defined as its own class or clustered in any other class.

Figure 54 and Figure 55 show the scores for test Batch 6 and 7, respectively. In each figure, the five scenario dimensions are shown from left to right. In each dimension, the Combiner's scores appear first, then MCC's. Each score bar is stacked from bottom to top, first with the number of correct judgments, then with the training errors, and then

with the misclassifications to total all judgements for that dimension. The method with the most correct judgments performs best in the dimension. The Combiner performs better than MCC in all five dimensions for each test Batch.

Figure 54: Accuracy of Scenario Identification performances by MCC and Combiner for samples in Batch 6

Figure 55: Accuracy of Scenario Identification performances by MCC and Combiner for samples in Batch 7

To summarize its performance, the Combiner was scored only on its heaviest-weighted scenario. The effects of this are best shown in how the Combiner and MCC viewed samples that did not contain Aroclors. Both the Combiner and MCC view $C_1N_1S_0M_0O_0$ and $C_0N_1S_0M_0O_0$ as indistinguishable. The Combiner gave equal, high weight to both classes when faced with a test sample from either class, and this scoring selected the first named class. Selecting the top-ranked class discriminated against ties, as seen in 40 $C_0N_1S_0M_0O_0$ samples that were counted as misclassified along the Contaminated dimension when the Combiner placed them in both the $C_1N_1S_0M_0O_0$ and $C_1N_1S_0M_0O_0$ with equal weights.

This discrimination is a byproduct of necessarily simplifying the interpretation of MCC and the Combiner, as well as the other competing methods, in order to score them. They

could not be separated by MCC and so were defined as the same class: therefore MCC Contaminated scores for Batches 6 and 7 include 80 training errors each due to this class. Distinguishing the presence of contamination in a sample that does not contain Aroclors turns out to be of trivial importance to the application, so MCC's lumping of both scenarios into one category could be justified. However, MCC must lump any scenarios that overlap, as shown in its difficulties distinguishing between other scenarios. Information is lost when it predicts a test sample belongs into a lumped scenario: only the Combiner can give relative likelihoods to each of the overlapping scenarios.

Investigating the Combiner's misclassifications for Batch 6 reveals that:

1. Contamination misclassifications occur in 3 types. In 42 of the 90 misclassifications of contamination large cases, the contamination did not scramble the Method opinions and so it went undetected. Forty more misclassifications were scored when Uncontaminated blanks were classified as Contaminated blanks: the scenario weights were the same but since the scorer could count only one scenario, the Contaminated blank scenario ranked first and these 40 were counted as misclassifications. The remaining 2 misclassifications occurred when two ADL Aroclors were present in each sample, apparently suggesting to the SI step that contamination was present when it was not.
2. Presence misclassifications have two properties. One is the misclassifying of a sample with an Aroclor as having no Aroclor, or a sample without an Aroclor as having an Aroclor. This misclassification affects the None dimension, and the

Combiner did not make this kind of an error. Never was a sample with no Aroclor mistakenly classified as containing an Aroclor, and even more importantly, never was a sample containing an Aroclor (and so having a Single or Multiple scenario) reported as containing no Aroclor. No sample-level False Negative or False Positives occurred.

3. The second misclassification of presence is misidentifying a Single as Multiple or a Multiple as a Single. These misclassifications occurred in three ways. Seven of the 15 misclassifications occurred in Contaminated samples, where the contamination and a Single Aroclor fooled the Methods into reporting an Aroclor that was not present. Six more misclassifications occurred when a sample was a) Contaminated b) had a second Aroclor in concentration less than $.15 \mu\text{g/ml}$ and c) had a first Aroclor in concentrations more than 3 times the second Aroclor. In this case, the first Aroclor was detected but not the second Aroclor, due to the small absolute size of the second Aroclor, the small relative size of the second Aroclor, and to the confounding effects of contamination in the sample. Two misclassifications occurred when contamination obscured the second Aroclor in a multiple Aroclor sample.
4. Overly-concentrated misclassifications occurred for two reasons. Thirty-one of the 44 misclassifications were at high WDL concentrations, at the boundary separating overly-concentrated (ADL) samples from within-detection-limits (WDL) samples, and mistakenly classified as At-Least-1-Over. The remaining thirteen misclassifications classified ADL samples as WDL, as an artifact of the CTS. Examining the context reveals that there are many ADL antecedents in rules extracted

from WDL samples. High WDL training samples often produced high estimates from the Methods, which, when crisply classified to form the SI rule antecedent, became ADL. Then, when analyzing an ADL sample's pattern of opinions, it matched some of these high WDL training samples better than the ADL training samples, so were classified back into a WDL scenario. Recall that many scenarios can be selected by the SI step, and only the highest weighted was used for scoring a classification as correct or as a misclassification.

Context. The Scenario Identification step produces information necessary to the internal workings of the Combiner, which is also useful for a human chemist as well. The SI step provides views of the background, or *context*, of a sample. Figure 56 shows the SI rules that fired, with their firing weights, for test sample 047ftest. All information except the "actual" and "ranked" information shown in the Figure is available for laboratory unknown samples. The SI subprocess placed 047ftest into scenario $C_1N_1S_0M_0O_0$ with a higher weight than its known scenario ("actual") $C_0N_1S_0M_0O_0$ and only $C_1N_1S_0M_0O_0$ ranked higher in weight ("rank" reflects actual scenarios score compared to all scenarios.). For a laboratory's test sample, of course, the sample's scenario would not be known.

The sample's opinions are translated and reordered into their primary homologue. This homologue is shown in "FYI sample" where FYI means, as usual, "For Your Information". The FYI sample is used only fleetingly by the Combiner (in finding the primary homologue order), but is very useful for the human investigator trying to match it to the SI Rules.

The SI rules are listed by number, pattern, and occurrence in each of the ten scenarios.

Many of the rules are omitted, but all that fired for this sample are included. The values in the far right column change for each sample, since they are the firing weight for the sample and that rule. 047ftest matched Rule 10 with a weight of .000813, the heaviest firing weight of all rules. This means that its FYI sample matched the Rule 10 pattern "112362223523335" better than it matched any other rule pattern. Rule 12 matches .000188, less than 25% of the weight of the heaviest rule, and the other fired rules match with even less weight. Rule 10's pattern was seen twice in the training data, in samples with $C_1N_1S_0M_0O_0$ scenarios. All other fired rules indicate $C_1N_1S_0M_0O_0$ or $C_0N_1S_0M_0O_0$, explaining why these two are the top ranked scenarios.

Explain why Sample 047ftest (scenario 00011) was placed in 00010

Sample		FYI sample		actual	ranked	placed
047ftest		112362223533335		00011	2	00010

Rule	Pattern	00010	00011	00100	00101	01000	10010	10011	10100	10101	11000	Rule Firing Weight
1	122262222522225	1	0	0	0	0	0	0	0	0	0	0
8	222252222522225	1	0	0	0	0	0	0	0	0	0	0
9	222352223523335	2	0	0	0	0	0	0	0	0	0	0
10	112362223523335	2	0	0	0	0	0	0	0	0	0	0.000813
11	222352333523335	1	0	0	0	0	0	0	0	0	0	0
12	122362223533235	1	0	0	0	0	0	0	0	0	0	0.000188
13	222342223522235	1	0	0	0	0	0	0	0	0	0	0
14	112362223522235	1	0	0	0	0	0	0	0	0	0	0
18	122362333533334	0	1	0	0	0	0	0	0	0	0	0
19	122363223533335	0	1	0	0	0	0	0	0	0	0	0.000016
20	221353333533335	0	1	0	0	0	0	0	0	0	0	0
21	122363333533335	0	2	0	0	0	0	0	0	0	0	0
25	322353333533335	0	1	0	0	0	0	0	0	0	0	0
26	112162225333335	0	1	0	0	0	0	0	0	0	0	0.000001
27	111163333533335	0	1	0	0	0	0	0	0	0	0	0
28	121163333533335	0	1	0	0	0	0	0	0	0	0	0
29	122362223433335	0	1	0	0	0	0	0	0	0	0	0.000008
30	122363333433335	0	1	0	0	0	0	0	0	0	0	0

Figure 56: Example of SI context information

6.2 Aroclor Presence Detection Rules

In the Aroclor Presence (AP) Detection step, the Combiner uses the CTS to learn how well each Method predicts the absence or presence of an Aroclor, based on a sample's scenario. The AP *confidence modalities* are automatically learned. They consist of *ConfAbsent* and *ConfPresent*. *ConfAbsent*(M,S) is the confidence that Method M's belief that the Aroclor is absent is correct for a sample in scenario S. The *ConfPresent*(M,S) is the confidence that Method M's belief that the Aroclor is present is correct for a sample in scenario S. Thus trained, the AP step analyzes a test sample to predict whether an Aroclor is present or not. In analyzing a test sample, the AP step uses

1) the Method opinions, 2) the scenario weights from the SI step, and 3) the learned confidence modalities. The following sections describe the training and testing of the AP subprocess, and show its performance on test batches.

6.2.1 Training The AP Subprocess

Like the other Combiner subprocesses, the AP subprocess uses the Methods' opinions for the samples in the CTS. For each training sample, the Methods produce fifteen opinions.

In training the AP subprocess, the following steps occur:

- **Translation.** The Combiner automatically translates the fifteen numerical opinions into crisp classifications of Present or Absent.
- **Counting.** The Combiner counts the number of times each Method correctly indicates the presence or absence of an Aroclor each scenario, as well as the total number of times the Method reported the presence or absence of an Aroclor in each scenario.
- **Formulation.** The Confidence modalities are developed as functions of the counts compiled in the previous step.

The rest of this section describes the training of the AP subprocess in detail.

Translation. The Method opinions are crisply classified into Absent, Present and Indeterminate. Quantities which are BDL are Absent, otherwise they are Present. The Identity classification corresponds exactly to the No, Yes, and Maybe identification classes.

Counting. For all judgments, for each Method and each scenario, AP counts how many times the Method reported a) Present, b) Present when Aroclor was present, c) Absent and d) Absent when no Aroclor was present.

Formulation. $\text{ConfPresent}(M,S)$ summarizes the correctness of Method M 's present reports in scenario S . It is a function of all correct present opinions, divided by all the present opinions, for Method M in scenario S . $\text{ConfAbsent}(M,S)$ similarly summarizes the correctness of Method M 's absent reports in scenario S . It is a function of all correct absent opinions, divided by all the absent opinions by Method M . Equation (14) gives the heuristically developed formula for determining ConfPresent from the percentage of correct present opinions, resulting in the fuzzy shape shown in Figure 57.

In Equation (14), N_{CP} is the number of judgements correctly made by Method M on samples in Scenario S with an Aroclor present, and N_{TP} is the total number of judgements attempted by Method M on samples in Scenario S with an Aroclor present. The equation's oddness is due to its evolution. Squaring N_{CP}/N_{TP} emphasizes the high correctness values superlinearly over the low ones. Subtracting a small number, experimentally set to .05, shapes the resulting equation so that a degree of doubt is allowed for even perfectly scoring Method and Scenario combinations. When run on Batch 5, the differentiation caused by the squaring was not extreme enough, so the whole term was again squared and diminished. This produced clearer discrimination among the training batch for the AP step. Just as the ConfPresent is diminished so that it is never "1", the minimum ConfPresent is set to a tiny positive number .0001. These provide the same flexibility as the .001 "tails" do in the finished definitions of Identity and Quantity.

$$ConfPresent(M,S) = ((N_{CP}(M,S)/N_{TP}(M,S))^2 - .05)^2 - .1$$

(14)

Figure 57: Heuristically shaped fuzzy set for ConfPresent

Equation (15) gives the heuristically developed formula for determining ConfAbsent given the percentage correct “absent” opinions for a Method in a scenario. The resulting fuzzy shape is shown in Figure 58. Like the development of ConfPresent(M,S), ConfAbsent(M,S) evolved through repeated testing on the CTS. NNI’s weight was diminished additionally.

$$ConfAbsent(M,S) = \begin{cases} \max(.0001, ((N_{CA}(M,S)/N_{TA}(M,S))^2 - .05)^2 - .3) & \text{for NNI in } C_1 \\ \max(.0001, ((N_{CA}(M,S)/N_{TA}(M,S))^2 - .05)^2) & \text{for all others} \end{cases} \quad (15)$$

In Equation (15), N_{CA} is the number of judgements correctly made by Method M on samples in Scenario S with no Aroclor present, and N_{TA} is the total number of judgements attempted by Method M on samples in Scenario S with no Aroclor present.

Figure 58: Heuristically shaped fuzzy set for ConfAbsent

6.2.2 Testing The AP Subprocess

To evaluate a test sample, the AP subprocess follows these steps:

- Translation. For each opinion, the AP step obtains the Method's opinion that the Aroclor is present and that it is absent. Both will be nonzero.
- Opinion weighting by scenario. The AP step assigns a belief to each

Method's absent and present opinions, based on scenario and confidence.

- Opinion summing by Aroclor. The AP step sums all of the weighted opinions for present and absent for an Aroclor to produce the step's belief for and against the presence of that Aroclor.
- Evaluate confidence. For each Aroclor, calculate the confidence that the Aroclor is either present or absent, based on the beliefs for absent and present. If unable to confidently report absence or presence, declare that the result is indeterminable for the Aroclor.

The rest of this section describes the testing phase of the AP subprocess in detail.

Translation. Method opinions are fuzzily classified into present and absent. For quantitative Methods, the fuzzy classification sets absent identical to the BDL membership, and sets present equal to the larger of the WDL and ADL memberships. For identification (NNI), absent is identical to the No membership value, and present is the maximum of the Maybe and Yes responses. Including Maybe as a present opinion deliberately biases against False Negatives, to avoid reporting of a sampled site as Aroclor-free when in fact it contains an Aroclor. Because of the "tails" on the fuzzy variables, all present and absent votes are greater than zero, and less than or equal to 1.

Opinion weighting by scenario. Having obtained a Method M's belief that the Aroclor is present and that it is absent (both will be nonzero), this step assigns a belief *to this belief*, based on scenario and confidence. For each Aroclor and each scenario S, the Combiner weights each Method's belief by the confidence modalities for that scenario and method.

This step produces the terms $\frac{ConfAbsent(M,S) * absent(M)}{ConfAbsent(M,S)}$ and

$\frac{Conf Present(M,S) * present(M)}{Conf Present(M,S)}$ for use in the next step, shown in Equation (16).

Opinion summing by Aroclor. Next, the Combiner sums all of the weighted beliefs for present and absent over all scenarios for an Aroclor to produce the AP step's belief for and against the presence of that Aroclor. This produces the *weighted mean*. Equation (16) shows the weighted means that produce present and absent beliefs for each of the three judgements in a test sample, one for each Aroclor.

$$\begin{aligned}
 Absent &= \frac{\sum_{all\ Scenarios\ S} \sum_{all\ Methods\ M} scenario_weight(S) * ConfAbsent(M,S) * absent(M)}{\sum_{all\ Scenarios\ S} \sum_{all\ Methods\ M} scenario_weight(S) * ConfAbsent(M,S)} \\
 Present &= \frac{\sum_{all\ Scenarios\ S} \sum_{all\ Methods\ M} scenario_weight(S) * Conf Present(M,S) * present(M)}{\sum_{all\ Scenarios\ S} \sum_{all\ Methods\ M} scenario_weight(S) * Conf Present(M,S)}
 \end{aligned}
 \tag{16}$$

Evaluate confidence. The Combiner produces two beliefs for each judgement: the belief that the Aroclor is present and the belief that the Aroclor is absent. The difference between the present and absent is divided by the max of the present and absent beliefs to produce a confidence, written in Equation (17).

$$AP\ Confidence = (present - absent) / (\max(present, absent))
 \tag{17}$$

If this confidence is greater than .06, the AP step says the Aroclor is present. If this confidence is less than -.23, the AP step says the Aroclor is absent. For confidences between the thresholds, the AP step says it is unable to determine presence or absence

and returns an indeterminate result.

6.2.3 AP Performance Results

The AP step was run on Batches 6 and 7, along with Dempster-Shafer (DS). The basics of the Dempster-Shafer algorithm are presented in 3.2.2. The DS algorithm uses the error measures associated with each Method opinion as the probability estimate that the opinion is correct. (Recall that NNI and MLR do not produce error measures, while NN, PCR, and PA do.) Each of the two techniques reports one of three outcomes for a judgment: present, absent, or indeterminate_result.

The results from the Combiner and from DS are scored in five categories: True Positive (TP), True Negative (TN), False Positive (FP), False Negative (FN) and Indeterminate Result (IR). A result of present is scored as a True Positive (TP) if the Aroclor is present for that judgement, and as a False Positive (FP) if the Aroclor is known to be absent for that judgment. A result of absent is scored as a True Negative (TN) if the Aroclor is absent for that judgment, and as a False Negative (FN) if the Aroclor is present for that judgment. Results of indeterminate_result are tallied in the Indeterminate Result (IR) category.

Figure 59 and Figure 60 display the scores for the Combiner and DS on Batches 6 and 7, respectively. From left to right, each category shows the number of judgements belonging to it for the Combiner and for DS.

For the TP and TN categories, higher scores are better. For both Batches, the Combiner scores higher than DS for TP and TN categories, indicating it made more correct

determinate judgments than DS. For the FP and FN categories, lower scores are better.

For both Batches, the Combiner scores lower than DS for FP and FN categories, indicating it made fewer incorrect determinate judgments.

The False Negative category warrants special attention. A False Negative tells the chemist that the Aroclor is absent when in fact Aroclor is present in the sample. The AP step reported one FN in each Batch. Their details, explanations, and impacts follow. Like its predecessor the SI step, the AP step misses a low-concentration Aroclor when

1. The Aroclor has less than .15 µg/ml concentration;
2. A second Aroclor is in the sample and its concentration is more than 3 times that of the missed Aroclor; and
3. The sample is contaminated.

In each sample where it misses the low-concentration Aroclor, the AP step detects the higher concentration Aroclor, and flags the sample and site as containing Aroclors. For Batch 6, sample 202ftest contains both 1254 (.15 µg/ml) and 1260 (.55 µg/ml), as well as contamination. Similarly, sample 222ftest in Batch 7 contains .55 µg/ml of Aroclor 1242, which is detected, and .05 µg/ml of Aroclor 1254 which is not detected, all in the presence of contamination. Again, the AP step detects one of the multiple Aroclors, and flags the sample and site as containing Aroclors. Since no samples are incorrectly reported as Aroclor-free, the AP step did not produce any sample-level False Negatives. Dempster-Shafer produced one sample-level False Negative, sample 302ftest in Batch 7, which contained .010 µg/ml of Aroclor 1254 in contamination. DS did not detect the

Aroclor and the sample was incorrectly reported as Aroclor-free.

The last category scored is IR. Its interpretation depends entirely on the values of the TP, TN, FP and FN categories. It is preferable to score a TP or TN, but then preferable to report an IR rather than produce an FP or FN. A low IR score is good but only if it does not drive up the FP and FN rate. The Combiner's AP step produced fewer IR judgments than did DS.

Figure 59: Accuracy of Aroclor Presence Detection performances by Combiner and DS for samples in Batch 6

Figure 60: Accuracy of Aroclor Presence Detection performances by Combiner and DS for samples in Batch 7

Figure 61 maps the AP results for Batch 6 by confidence and known concentration.

Judgements with zero Aroclors were moved to -1 on the concentration axis to separate them from the nonzero Aroclors for clarity in interpreting the graph. The FN category contains one element, confidence of -.24 – the cut-off determined by viewing the CTS was -.23 for deciding whether an AP judgment was absent or indeterminate. In this FN case, where the AP step incorrectly concluded the Aroclor was absent, the confidence is borderline. The FP category cuts off at .06, and contains 18 judgments. All FP judgments are in samples that contain at least one Aroclor, and are Contaminated. AP did not produce any *sample level* FN or FPs – that is, it never missed all the Aroclors in an Aroclor containing sample, and it never reported an Aroclor in an Aroclor free sample.

Figure 61: Confidence by known concentration for Batch 6

6.3 Aroclor Quantification Rules

In the Aroclor Quantification (AQ) step, the Combiner learns and uses the knowledge of how accurately a Method predicts the concentration of an Aroclor, based on a sample's scenario. These *Quantification Accuracies* are automatically learned. They are based on the average and standard deviation of the quantification error seen in the CTS, by Method and scenario. One is called the $\text{AccShift}(M,S)$ and is the average quantification error the Combiner saw in Method M 's opinions on training samples in scenario S . The second quantification accuracy is $\text{AccHeight}(M,S)$ and it is formulated so that higher values correspond to less standard deviation in the quantification error for Method M 's opinions on training samples in scenario S . It is a function inversely proportional to the standard

deviation of the error the Combiner observed in Method M's opinions for training samples in scenario S. In analyzing a test sample, the AQ step uses 1) the quantification Method opinions, 2) the scenario weights from the SI step, and 3) the learned quantification accuracies. The following sections describe the training and testing of the AQ subprocess, and show its performance on test batches.

6.3.1 Training The AQ Subprocess

Like the other Combiner subprocesses, the AQ subprocess uses the Methods' opinions for the samples in the CTS. For each training sample, the Methods produce fifteen opinions.

In training the AQ subprocess, these steps occur:

- Measuring quantification error. The AQ step calculates the average and the standard deviation of the quantification error seen in the CTS, by Method and scenario.
- Formulation. The AQ step inverts and normalizes the standard deviation measures so that narrowly deviating Method and scenario combinations score nearer to one and widely deviating Method and scenario combinations score nearer to zero.

The rest of this section describes the training of the AQ subprocess in detail.

Measuring quantification error. For each training judgement, the actual concentration is known. The difference between the actual concentration and the Method opinion is the quantification error. For each Method, in each scenario, the AQ step calculates the

average quantification error, $Av(M,S)$, and the standard deviation of the quantification error, $Sdev(M,S)$.

Formulation. $AccShift(M,S)$ is exactly the average quantification error of Method M 's opinions in scenario S , or $Av(M,S)$. $AccShift(M,S)$ is in $\mu g/ml$ and can be any real number. The second accuracy measure is $AccHeight(M,S)$. The function that shapes $Sdev(M,S)$ into $AccHeight(M,S)$ emphasizes high accuracy superlinearly to low accuracy results as shown in Figure 62 and Equation (18). This function was developed manually by training on the CTS and does not change between batches. It carefully preserves these relationships: 1) The highest accuracies (precisely valued at 1) belong only to Method and scenario combinations that had zero standard deviation in the CTS. 2) The lowest accuracies are non-zero but lower than any naturally occurring $AccHeight(M,S)$. The Combiner finds the MSD, the minimum standard deviation that is not zero, in the CTS and uses half of the MSD as its artificially induced lower bound. 3) All accuracies $AccHeight(M,S)$ stay in inverse relationship to their $Sdev(M,S)$ order – no nonzero $Sdev(M,S)$ can obtain a perfect 1 value for $AccHeight(M,S)$ (which would incorrectly weight it equally as heavily as a perfectly performing Method and scenario combination) since they are adjusted downward by $MSD/2$.

Figure 62: Formulating $AccHeight(M,S)$ from $Sdev(M,S)$ (note log scale on y-axis)

$$AccHeight(M,S) = \begin{cases} \max(MSD/Sdev(M,S) - MSD/2, MSD/2) & \text{if } Sdev(M,S) > 0 \\ 1 & \text{if } Sdev(M,S) = 0 \end{cases} \quad (18)$$

6.3.2 Testing The AQ Subprocess

The AQ step uses the Method opinions, the scenario weights from the SI step, and the learned Accuracies to estimate a concentration for each Aroclor in a test sample. The AQ subprocess manipulates opinions in three steps.

- **Opinion shifting.** For each weighted scenario S and each Method M 's opinion, AQ corrects the opinion by subtracting the average quantification error for the Method in the scenario.

- Opinion weighting by scenario and variance. The AQ step scales the corrected fuzzy quantity opinion in inverse proportion to the Method's variability of quantification error in the scenario.
- Opinion summing by Aroclor. For each Aroclor, AQ sums the weighted and shifted opinions to produce a composite quantification for the Aroclor.

The rest of this section describes the AQ subprocess for analyzing a test sample in detail.

Opinion shifting. For every scenario S , the AQ step shifts Method M 's opinion by $\text{AccShift}(M,S)$. This shift compensates for the average quantification error of the Method's opinions in the scenario.

Opinion weighting by scenario and variance. The AQ subprocess weights the shifted opinion from method M by two factors 1) the scenario weight for each scenario S and 2) the $\text{AccHeight}(M,S)$.

Section 3.3.1.2 described **min** and **mult**, the two most common approaches to weighting a rule with more than one antecedent. The AQ process uses **mult** so that all elements of the antecedents always contribute to the weight; using **min** forces the scenario weight and quantification accuracy to compete, thereby losing information. Empirical comparisons using **mult** and **min** follow, and bear out this explanation.

Two methods **min** and **mult** are run against the CTS and two testing batches. Method **min** sets the rule firing weight to $\text{min}(\text{scenario_weight}(S), \text{AccHeight}(M,S))$. Method **mult** multiplies the antecedents so that the rule firing weight is

scenario_weight(S)*AccHeight(M,S).

Figure 63 compares the accuracy of min and mult on the three batches. For each batch, the average error and the standard deviation of the error against the known concentration is shown for both min and mult. Lower scores are better, indicating that the method estimated the Aroclor concentration more accurately. Method mult quantifies Aroclors observably more accurately than does min.

Figure 63: Justifying antecedent multiplication for Aroclor quantification by comparing error measurements

Error measurements tell only part of the story. Also important is how the AQ method fails. Figure 64 compares min and mult by examining their failure modes for Batches 5

through 7.

Figure 64: Justifying antecedent multiplication for Aroclor quantification by comparing failure modes

The methods for AQ antecedent composition show similar False Negative rates, but far different False Positive rates. The **mult** method, which multiplies the antecedents and then takes the minimum of 1) their product and 2) the consequent of the rule, shows fewer False Positives. This, combined with the better quantification accuracy shown in Figure 63, leads to the selection of **mult** for composing the antecedents of AQ rules.

Opinion summing by Aroclor. For each Aroclor, there is a collection of weighted, shifted opinions for different scenarios and Methods. The AQ step sums these for an Aroclor to

produce a final fuzzy set whose defuzzified value is the step's estimate for the judgement's concentration.

6.3.3 AQ Performance Results

The Combiner performs well against the competing techniques. Quantification accuracies are shown in Figure 65 for Batch 6 and in Figure 67 for Batch 7. Figure 66 and Figure 68 show the degree the Combiner's performance surpassed that of the competitors.

Majority Voting, or Averaging, is discussed in 3.2.3. Averaging fails to account for the individual biases, or coverages, and its failure shows why coverage must be considered when integrating learned models.

Method MLR is included because it is the most accurate of the individual methods for Aroclor Quantification. AQ improves 10% to 20% on MLR's already highly-accurate opinion.

Method PA is included since it represents the human chemist's approach to Aroclor Quantification. PA turned in the worst quantification performance of the four techniques compared.

Aroclor Quantification - Batch 6

Figure 65: Accuracy of Aroclor Quantification performances by Combiner and competitors for samples in Batch 6

Figure 66: Improvement using AQ results instead of competitors for samples in Batch 6

Figure 67: Accuracy of Atroclor Quantification performances by Combiner and competitors for samples in Batch 7

Figure 68: Improvement using AQ results instead of competitors for samples in Batch 7

The Combiner returned more accurate results than the representative human method of PA, the domain-ignorant combining method of Averaging, and, against its only serious competitor, improved accuracy 10% to 20% over MLR.

6.4 Summary Of Testing Results

The Combiner's three steps were tested against individual, traditional techniques. In each case, the Combiner gave superior results as well as extensive background information regarding the test sample and the Combiner's reasoning.

For the Scenario Identification step, the Combiner was compared to Multicategory Classification (MCC). The Combiner handled the nonlinear, poorly separated space of

the Aroclor Interpretation problem far better than MCC did. Figure 69 summarizes these results.

Scenario Identification :		Combiner vs. Multicategory Classification (MCC)
<i>Class</i>	<i>Combiner improves on MCC by:</i>	
Contamination		15%
None		1%*
Single		55%
Multiple		55%
Overconcentration		6%

* MCC misclassified two samples; the Combiner correctly classified all samples

Figure 69: Summary of Combiner superiority for SI

For the Aroclor Identification step, the Combiner was compared to Dempster-Shafer. As summarized in Figure 70, the Combiner produced 46% fewer false positive errors than DS did, and 78% fewer false negative errors. In addition, it referred fewer samples with indeterminate results to the operator.

Aroclor Presence		
Detection:	Combiner vs. Dempster Shafer (DS)	
<i>Error Type</i>	<i>Combiner improves on DS by:</i>	
False Positive		46%
False Negative		78%

Figure 70: Summary of Combiner superiority for AP

For the Aroclor Quantification step, the Combiner was compared to Majority Voting (Averaging) and the human representative Method of Peak Area Analysis, each of which the Combiner greatly outperformed. The Combiner was also compared to the best individual quantification method, MLR and improved 14% on it. Figure 71 summarizes

these performances.

Aroclor Quantification:	<i>Combiner improves on listed technique by:</i>
MLR	14%
Averaging	92%
Peak Area	95%

Figure 71: Summary of Combiner superiority for AQ

7. Conclusions

7.1 Summary

This paper presented a new fuzzy Combiner method for Integrating Multiple Learned Models and applied it to Aroclor Interpretation. The Combiner is a general purpose IMLM solution. Its unique scenario-based architecture provides a clean method of including application-specific knowledge from human experts. Once scenario elements are defined to partition the testing domain, all rule sets are automatically learned.

Five scenario elements are used to partition the testing domain for Aroclor Interpretation into scenarios. These elements include one contamination descriptor, three presence descriptors (*none*, *single* and *multiple*), and one overconcentration descriptor.

Combiner's first step, SI, learns rules from very sparse, synthetic training data consisting of results from a suite of trained programs called Methods. The Method training domain consists of one scenario, that of single, uncontaminated Aroclors. Specifically, Methods train on five standard concentrations for each of the three Aroclors.

The Combiner uses two tactics to attack the key problem in IMLM, which is testing in scenarios outside a training domain. First, the Combiner artificially extends the Method training domain through the Synthetic Chromatogram Generator. The Synthetic Chromatogram Generator uses the fifteen genuine standards that constitute the Method Training Set and a Noise Engine to generate chromatograms in all scenarios. These chromatograms are *representative*; the Combiner does not attempt to reproduce every

possible sample signal. The Method Training Set consists of fifteen samples, all in one scenario. In contrast, the Combiner Training Set consists of two hundred samples, twenty in each of the ten possible scenarios. Since these samples are limited in volume and content, much of the testing domain is still not covered by the training samples.

The second tactic used by the Combiner to exploit very sparse and representative training data is its ability, through fuzzy logic, to *approximately* match an SI rule. Every testing sample will match every rule to some degree, and a rule's firing weight clearly reflects how closely the test sample resembles a sample seen in the training set. SI produces fuzzy belief weights for each scenario by approximately matching the SI rules.

The Combiner's second step, AP, classifies each of three Aroclors as *present* or *absent* in a sample. The third step, AQ, produces quantitative values for the concentration of each Aroclor in a sample. AP and AQ use automatically learned empirical biases for each of the Methods in each scenario. Through fuzzy logic, AP and AQ combine scenario weights, automatically learned biases for each of the Methods in each scenario, and Methods' results to determine results for a sample. AP and AQ use well-established techniques internally; their novel features are the use of SI's scenario weights, and the nature of the bias estimations learned by each step.

The Combiner is a powerful logic tool for evidence accrual. It solves the "chicken-and-egg" dilemma caused when relying on scenario-dependent programs to determine the scenario for a sample. This bootstrapping requires a suite of BLCs that fail divergently in response to changes in quantifiable conditions in the input. Given this small glimpse of

the structure to a problem, the Combiner can gain a handhold from which it estimates the overall structure of the problem and pries out previously inaccessible information using these newfound inferences. Inputs may be heterogeneous, as shown by the use of both quantities and probabilities in the Aroclor Interpretation application. Similarly in this application, we showed the Combiner's ability to deliver heterogeneous outputs such as Boolean presence classifications and quantitative concentration determinations.

Because of its straightforward approach, the rules and reasons the Combiner reaches its conclusions are easily available for accountability and tracability. Scenario weights are never explicitly needed by an operator, but are available and deliver a wealth of additional information about the real-world conditions affecting a sample.

The Combiner components SI, AP and AQ were compared to Multicategory Classification, Dempster-Shafer and MLR respectively. The Combiner was shown to perform more accurately than each competitor.

- SI improves upon MCC for classification accuracy. MCC attempts to linearly separate the Combiner Training Set (CTS), and fails because the CTS is not linearly separable: for example, all samples in the uncontaminated blank scenario and the contaminated blank scenario produce identical results. SI does not require linear separability among scenarios. Instead, SI uses fuzzy logic to indicate possible membership in multiple scenarios, such as reporting equal membership likelihoods for a sample in the uncontaminated blank and the contaminated blank scenario.
- SI's importance to the Combiner goes beyond the accuracy of its heaviest-weighted

classification. MCC is forced to select one and only one possible scenario (or clumped scenarios). Information about other likely scenarios is lost. In contrast, SI uses fuzzy logic values for all scenario weights, simply reporting all evidence of possible scenario membership. The later steps of AP and AQ use all scenario evidence, and these scenario weights and SI rule firing weights are available for explanations, accountability and tracability.

- AP improves upon Dempster-Shafer (DS) for Aroclor presence classification in soundness of theory. Relying on Bayesian probability, DS requires Methods to be working inside their training domain. This is not guaranteed in the Aroclor Interpretation problem, nor any problem in the IMLM arena. DS requires guaranteed correct results, as well as error measures from the Methods. In cases where no error measure is produced, DS has no basis for the certainty of a result. In contrast, AP empirically learns error measures from the Combiner Training Set for each Method in each scenario, thus always having a basis for the certainty of a Method's result.
- AP improves upon Dempster-Shafer (DS) for Aroclor presence classification empirically. DS uses no application-specific information and returns bald numbers with no application context. This damages any explanation facility DS might have. DS formulas are complex to unravel and once the mathematics is understood, the intermediate values lack context. In contrast, the Combiner is based on the structure of the application problem, consequently, firing weights and other intermediate values reflect the descriptive language of the application and are intuitive to an application domain expert.

- AQ improves upon the best single Method, MLR, for quantification accuracy. AQ uses all responses from all Methods, weighted by the scenario weights and learned biases. By learning and correcting for MLR's bias in various scenarios, AQ improves on the most accurate Method.
- AQ offers other advantages over MLR. MLR can fail to converge. It works on only vector inputs. In contrast, the Combiner accepts any format of input. It uses all available inputs in AQ, even non-quantity opinions from NNI affect AQ because they are providing information in the SI step, which flows into AQ through the scenario weights.

In summary, the Combiner is an appropriate and powerful solution for any IMLM problem.

7.2 Future Work

Future work falls into three categories. These are to improve the Combiner, to advance the state of the field for IMLM, and to apply the DIM to other applications.

To improve the Combiner, we give four suggestions.

- Cross check step findings. Scenario weights from the SI subprocess are used in the AP and AQ steps, but the AP and AQ results are not checked against each other. The author suggests presenting the Combiner's findings, and flagging contradictions such as AP finding the presence of an Aroclor that AQ indicates is absent, or AP and AQ findings that do not fit with the highest weighted scenarios. The human operator then

may check the consistency of these reports and investigate the sample with all the information the Combiner can give.

- Add a recalculation feature. This recalculation feature would allow the operator to influence the scenario weights and recalculate AP and AQ with the adjusted weights. In many cases, information about a sample will be available from other samples from the site, stored in databases or passed by word of mouth or report. For example, the presence of oil may be obvious to the sample gathering personnel. The recalculation feature would allow the integration of outside assumptions into the scenario weights and expand the usefulness of the Combiner.
- Provide a graphical user interface (GUI) for showing data, rules and findings to the operator, and through which the operator can examine these in depth, play "what if" with new scenario estimates and request recalculations of steps.
- Develop archiving and version control for production use. In order to pass documentation requirements for significant use in regulated laboratories, information such as the standards data for a batch, the version numbers of the SI, AP & AQ rules used for a sample and copies of those rules need to be retained in a safe and accessible way. In short, any data analysis for a sample must be able to be precisely recreated from the stored data and produce identical results to the original analysis, no matter how many recalibrations or program updates have occurred since the original analysis.

To advance the state of the field of Integrating Multiple Learned Models, we offer the idea of identifying features in order to better characterize BLCs for IMLM. Currently, all BLCs are viewed as "black boxes". Identifying the features that make BLCs fail or succeed in various problem subdomains (scenarios) would create thesaurus classes of BLCs. Any BLC could be plugged into the proper class's place in an IMLM problem and the IMLM solution would continue to work since the key features had not changed. Currently the field must view each BLC as a unique entity since no descriptive or functional taxonomy of BLCs has been developed. It is possible that the current "not independent, probably working outside their training domains" class is the only characterization possible for BLCs, but it has not been explored yet.

Future uses for the DIM and its Combiner fit any application integrating multiple sensors. Early discussions with information systems professionals from the pharmaceutical field indicate that drug discovery is ripe for IMLM[39],[40]. In the drug discovery cycle, a "family" of compounds is created – structurally they have much similarity but some differences. The pharmacological effect of these compounds is measured via various chemistries. These measures provide hints as to the physiological usefulness of each compound, which of course cannot be proven until years of FDA-supervised testing. Culling useful compounds from irrelevant ones as early as possible in the drug discovery process is critical to pharmaceutical companies. Identifying a useful compound by accruing evidence from various measures is exactly an IMLM problem.

Other uses of the DIM include quick identification of a biological or chemical warfare agent. The Combiner's SI subprocess can be quickly trained on data that is "sort of" like

a real test sample, an important feature when working with noncollaborators. The SI subprocess not only gives relative belief weights for all possible scenarios, but can also indicate how many rules contributed to the result and how strongly each contributed. This tells the person familiar with these internal mechanisms that if one rule fired with a very high weight, the test compound is very much like one of the samples seen in the training set. If all the fired rules have small weights, the test compound is not very much like anything in the training set and this alerts the operator that the test compound may be something new.

A last note on possible applications of the Combiner and/or the DIM. The Combiner is a general-purpose IMLM technique. The Combiner is an appropriate and effective tool for any IMLM application.

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Appendix A: Synthetic samples of Batch 2 under construction

The figures in this Appendix show the components and final result of chromatogram synthesis. Some chromatograms are the sum of two and some the sum of three chromatogram components. There is always a complete chromatogram in the composition, which contains the baseline and the control spikes. The complete chromatogram is shown in the topmost plot for each figure. The bottommost plot shows the synthesized chromatogram. The one or two intermediate plots show the reduced chromatograms that contributed Aroclor signal to the synthesized chromatogram. For each Aroclor, the following formulas were made in Batch 2.

- .100 ug/ml = 2 * 0.050 ug/ml
- .200 ug/ml = 2 * 0.100 ug/ml
- .200 ug/ml = 0.100 ug/ml + 2 * 0.050 ug/ml
- .400 ug/ml = 2 * 0.200 ug/ml
- .400 ug/ml = 0.200 ug/ml + 2 * 0.100 ug/ml
- .800 ug/ml = 2 * 0.400 ug/ml
- .800 ug/ml = 0.400 ug/ml + 2 * 0.200 ug/ml

Where two possible formulations occur, their graphs are shown on the same page.

Appendix B: Synthetic samples of Batch 2 compared to genuine counterparts

The following figures show the 21 synthetic chromatograms of Batch 2 in the middle plot, their genuine counterpart in the topmost plot, and the arithmetic difference between the two in the bottommost plot.

For each Aroclor, the following formulas were made in Batch 2.

- .100 ug/ml = 2 * 0.050 ug/ml
- .200 ug/ml = 2 * 0.100 ug/ml
- .200 ug/ml = 0.100 ug/ml + 2 * 0.050 ug/ml
- .400 ug/ml = 2 * 0.200 ug/ml
- .400 ug/ml = 0.200 ug/ml + 2 * 0.100 ug/ml
- .800 ug/ml = 2 * 0.400 ug/ml
- .800 ug/ml = 0.400 ug/ml + 2 * 0.200 ug/ml

Where two possible formulations occur, their graphs are shown on the same page.

Validation of Synthetic Chromatogram: .100 ug/mg 1242 from .050 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 200 ug/mg 1242 from .100 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 200 ug/mg 1242 from .100, .050, .050 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 400 ug/mg 1242 from .200 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 400 ug/mg 1242 from .200, .100, .100 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .800 ug/mg 1242 from .400 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .800 ug/mg 1242 from .400, .200, .200 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .100 ug/mg 1254 from .050 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 200 ug/mg 1254 from .100 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 200 ug/mg 1254 from .100, .050, .050 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 400 ug/mg 1254 from .200 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 400 ug/mg 1254 from .200, .100, .100 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .800 ug/mg 1254 from .400 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .800 ug/mg 1254 from .400, .200, .200 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .100 ug/ml 1260 from .050 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .200 ug/mg 1260 from .100 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .200 ug/mg 1260 from .100, .050, .050 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 400 ug/mg 1260 from .200 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: 400 ug/mg 1260 from .200, .100, .100 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .800 ug/mg 1260 from .400 ug/ml Genuine Chromatogram

Validation of Synthetic Chromatogram: .800 ug/mg 1260 from .400,.200,.200 ug/ml Genuine Chromatogram

Appendix C: Batch 2 Report

Batch 2 (standards space) Validation. The Report first lists opinions for Aroclor 1242, then 1254, and 1260. The Aroclor is indicated in the left corner of the title bar. The first column contains the sample identifier. The second column indicates the sample's scenario, in Contamination, None, Single Multiple, and Overconcentration order. The next two columns are obsolete and not titled. The next column contains a single floating point number, which is the Known concentration of the specific Aroclor in the sample. The last five columns are Method opinions, as shown in the title bar. The quantity opinions are presented as two numbers, separated by a "/". The first is the quantity estimate, and the second is the error estimate, if one was provided by the Method. Neural Net for Identity returns a probability between 0 and 1 that the specific Aroclor is present in the sample.

1242	Scenario			Known	MLR	N-NET	N-NET(id)	PCR	PA
003ftest	00100	0	-1	0.100	0.104/0.000	0.137/0.001	1.000	0.119/0.009	0.144/0.005
004ftest	00100	0	-1	0.200	0.218/0.000	0.285/0.003	1.000	0.238/0.009	0.296/0.016
005ftest	00100	0	-1	0.400	0.425/0.000	0.540/0.005	1.000	0.448/0.009	0.580/0.017
006ftest	00100	0	-1	0.800	0.890/0.000	1.059/0.013	1.000	0.858/0.012	1.114/0.064
009ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
010ftest	00100	0	-1	0.000	0.000/0.000	0.025/0.022	0.156	0.000/0.000	0.000/0.000
011ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	1.046/1.353
012ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	1.926/2.451
015ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
016ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
017ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
018ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.267	0.000/0.000	0.000/0.000
104ftest	00100	0	-1	0.200	0.222/0.000	0.283/0.004	1.000	0.240/0.009	0.302/0.015
105ftest	00100	0	-1	0.400	0.444/0.000	0.554/0.005	1.000	0.467/0.009	0.587/0.029
106ftest	00100	0	-1	0.800	0.918/0.000	1.080/0.018	1.000	0.887/0.012	1.114/0.064
110ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.178	0.028/0.009	0.327/0.503
111ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.622/0.932
112ftest	00100	0	-1	0.000	0.000/0.000	0.029/0.014	0.200	0.000/0.000	2.012/2.591
116ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
117ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	0.000/0.000
118ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.244	0.036/0.012	0.000/0.000

1254	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
003ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.053/0.070
004ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.119/0.135
005ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.237/0.247
006ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.474/0.476
009ftest	00100	0 -1 0.100	0.102/0.000	0.135/0.003	1.000	0.063/0.010	0.145/0.010
010ftest	00100	0 -1 0.200	0.211/0.000	0.269/0.005	1.000	0.191/0.010	0.300/0.013
011ftest	00100	0 -1 0.400	0.431/0.000	0.524/0.003	1.000	0.384/0.010	0.595/0.024
012ftest	00100	0 -1 0.800	0.864/0.000	1.002/0.008	1.000	0.806/0.012	1.100/0.000
015ftest	00100	0 -1 0.000	0.000/0.000	0.029/0.017	0.200	0.000/0.000	0.000/0.000
016ftest	00100	0 -1 0.000	0.000/0.000	0.058/0.032	0.156	0.000/0.000	0.000/0.000
017ftest	00100	0 -1 0.000	0.000/0.000	0.077/0.063	0.222	0.000/0.000	0.000/0.000
018ftest	00100	0 -1 0.000	0.000/0.000	0.133/0.120	0.222	0.000/0.000	0.000/0.000
104ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.120/0.135
105ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.248/0.258
106ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.480/0.477
110ftest	00100	0 -1 0.200	0.212/0.000	0.268/0.006	1.000	0.161/0.010	0.306/0.017
111ftest	00100	0 -1 0.400	0.445/0.000	0.527/0.007	1.000	0.384/0.010	0.607/0.031
112ftest	00100	0 -1 0.800	0.899/0.000	1.011/0.004	1.000	0.799/0.012	1.150/0.067
116ftest	00100	0 -1 0.000	0.000/0.000	0.057/0.031	0.200	0.000/0.000	0.000/0.000
117ftest	00100	0 -1 0.000	0.000/0.000	0.095/0.065	0.200	0.000/0.000	0.000/0.000
118ftest	00100	0 -1 0.000	0.000/0.000	0.149/0.125	0.111	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA	.
003ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
004ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
005ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
006ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.000/0.000
009ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.157/0.184
010ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.310/0.340
011ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.026/0.008	0.594/0.619
012ftest	00100	0 -1	0.000	0.000/0.000	0.031/0.023	0.133	0.000/0.000	1.051/0.983
015ftest	00100	0 -1	0.100	0.107/0.000	0.136/0.003	1.000	0.123/0.008	0.141/0.010
016ftest	00100	0 -1	0.200	0.212/0.000	0.266/0.004	1.000	0.238/0.008	0.278/0.019
017ftest	00100	0 -1	0.400	0.435/0.000	0.520/0.005	1.000	0.468/0.008	0.562/0.030
018ftest	00100	0 -1	0.800	0.861/0.000	0.980/0.009	1.000	0.857/0.010	1.056/0.050
104ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.000/0.000
105ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
106ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.000/0.000
110ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.027/0.008	0.320/0.367
111ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.025/0.008	0.614/0.665
112ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.044	0.041/0.010	1.123/1.133
116ftest	00100	0 -1	0.200	0.219/0.000	0.267/0.005	1.000	0.245/0.008	0.278/0.022
117ftest	00100	0 -1	0.400	0.448/0.000	0.517/0.009	1.000	0.473/0.008	0.563/0.050
118ftest	00100	0 -1	0.800	0.898/0.000	0.998/0.013	1.000	0.911/0.011	1.129/0.045

Appendix D: Batch 3 Report

Batch 3. Duplicates Batch 1 uncontaminated samples. October 6, 1997. The Report first lists opinions for Aroclor 1242, then 1254, and 1260. The Aroclor is indicated in the left corner of the title bar. The first column contains the sample identifier. The second column indicates the sample's scenario, in Contamination, None, Single Multiple, and Overconcentration order. The next two columns are obsolete and not titled. The next column contains a single floating point number, which is the Known concentration of the specific Aroclor in the sample. The last five columns are Method opinions, as shown in the title bar. The quantity opinions are presented as two numbers, separated by a "/". The first is the quantity estimate, and the second is the error estimate, if one was provided by the Method. Neural Net for Identity returns a probability between 0 and 1 that the specific Aroclor is present in the sample.

1242	Scenario			Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	01000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
002ftest	00100	0	-1	0.050	0.049/0.000	0.069/0.001	1.000	0.068/0.009	0.066/0.000
003ftest	00100	0	-1	0.100	0.098/0.000	0.140/0.001	1.000	0.134/0.009	0.143/0.005
004ftest	00100	0	-1	0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
005ftest	00100	0	-1	0.400	0.393/0.000	0.540/0.007	1.000	0.477/0.009	0.564/0.005
006ftest	00100	0	-1	0.800	0.785/0.000	1.028/0.021	1.000	0.881/0.012	1.029/0.045
007ftest	01000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
008ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
009ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
010ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
011ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.963/1.242
012ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	1.765/2.247
013ftest	01000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
014ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
015ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
016ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
017ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.289	0.000/0.000	0.000/0.000
018ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.733	0.000/0.000	0.000/0.000
019ftest	01000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
020ftest	00010	0	-1	0.050	0.049/0.000	0.073/0.002	1.000	0.109/0.009	0.152/0.127
021ftest	00010	0	-1	0.100	0.099/0.000	0.148/0.004	0.978	0.174/0.009	0.312/0.251
022ftest	00010	0	-1	0.200	0.196/0.000	0.283/0.008	0.978	0.292/0.009	0.605/0.473
023ftest	00010	0	-1	0.400	0.395/0.000	0.578/0.018	0.956	0.530/0.012	1.172/0.863
024ftest	00010	0	-1	0.800	0.786/0.000	1.111/0.043	0.956	0.942/0.020	2.200/1.603
025ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.733	0.000/0.000	0.000/0.000
026ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	1.765/2.247
027ftest	00100	0	-1	0.800	0.785/0.000	1.028/0.021	1.000	0.881/0.012	1.029/0.045
028ftest	00010	0	-1	0.800	0.785/0.000	1.053/0.014	1.000	0.928/0.016	2.814/2.229
029ftest	00010	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.031/0.009	0.000/0.000
030ftest	00010	0	-1	0.050	0.049/0.000	0.070/0.002	1.000	0.086/0.009	0.074/0.009
031ftest	00010	0	-1	0.200	0.196/0.000	0.337/0.013	0.911	0.315/0.016	1.442/1.593
032ftest	00010	0	-1	0.200	0.197/0.000	0.310/0.011	0.956	0.306/0.013	0.450/0.182
033ftest	00010	0	-1	0.100	0.100/0.000	0.170/0.005	0.956	0.188/0.013	1.262/1.580
034ftest	00010	0	-1	0.400	0.395/0.000	0.569/0.010	1.000	0.511/0.013	2.296/2.169
035ftest	00010	0	-1	0.800	0.785/0.000	1.023/0.020	1.000	0.920/0.013	1.217/0.279
036ftest	00010	0	-1	0.800	0.786/0.000	1.054/0.025	1.000	0.934/0.016	1.217/0.195
037ftest	00010	0	-1	0.050	0.049/0.000	0.091/0.011	0.689	0.102/0.011	1.816/2.191
038ftest	00010	0	-1	0.050	0.048/0.000	0.171/0.052	0.489	0.125/0.012	0.471/0.538
039ftest	00010	0	-1	0.000	0.000/0.000	0.045/0.040	0.156	0.033/0.009	0.000/0.000
040ftest	00010	0	-1	0.800	0.785/0.000	1.025/0.020	1.000	0.921/0.013	1.350/0.499
041ftest	00100	0	-1	0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007

1242	Scenario		Known	MLR	N-NET	N-NET(id)	PCR	PA
042ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
043ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
044ftest	00100	0 -1	0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
045ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
046ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
047ftest	00100	0 -1	0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
048ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
049ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
050ftest	00010	0 -1	0.200	0.196/0.000	0.287/0.007	0.978	0.294/0.010	0.407/0.156
051ftest	00010	0 -1	0.200	0.196/0.000	0.287/0.007	0.978	0.294/0.010	0.407/0.156
052ftest	00010	0 -1	0.200	0.196/0.000	0.287/0.007	0.978	0.294/0.010	0.407/0.156
064ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
076ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1254	Scenario		Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
002ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.000/0.000
003ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.052/0.069
004ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
005ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.230/0.239
006ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.447/0.439
007ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
008ftest	00100	0 -1	0.050	0.050/0.000	0.068/0.002	0.956	0.035/0.010	0.065/0.001
009ftest	00100	0 -1	0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
010ftest	00100	0 -1	0.200	0.199/0.000	0.267/0.000	1.000	0.197/0.010	0.294/0.005
011ftest	00100	0 -1	0.400	0.398/0.000	0.521/0.009	1.000	0.412/0.010	0.559/0.009
012ftest	00100	0 -1	0.800	0.796/0.000	0.996/0.027	1.000	0.776/0.012	1.000/0.000
013ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
014ftest	00100	0 -1	0.000	0.000/0.000	0.027/0.016	0.133	0.000/0.000	0.000/0.000
015ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
016ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
017ftest	00100	0 -1	0.000	0.000/0.000	0.063/0.059	0.156	0.000/0.000	0.000/0.000
018ftest	00100	0 -1	0.000	0.000/0.000	0.117/0.108	0.156	0.000/0.000	0.000/0.000
019ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
020ftest	00010	0 -1	0.050	0.050/0.000	0.064/0.004	0.711	0.000/0.000	0.167/0.029
021ftest	00010	0 -1	0.100	0.099/0.000	0.115/0.007	0.689	0.034/0.010	0.301/0.080
022ftest	00010	0 -1	0.200	0.201/0.000	0.235/0.013	0.778	0.120/0.010	0.586/0.149
023ftest	00010	0 -1	0.400	0.397/0.000	0.393/0.028	0.689	0.314/0.013	1.119/0.285
024ftest	00010	0 -1	0.800	0.802/0.000	0.729/0.056	0.667	0.632/0.022	2.056/0.512
025ftest	00100	0 -1	0.000	0.000/0.000	0.117/0.108	0.156	0.000/0.000	0.000/0.000
026ftest	00100	0 -1	0.800	0.796/0.000	0.996/0.027	1.000	0.776/0.012	1.000/0.000
027ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.447/0.439
028ftest	00010	0 -1	0.800	0.799/0.000	1.136/0.020	1.000	0.704/0.017	1.522/0.459
029ftest	00010	0 -1	0.050	0.050/0.000	0.069/0.005	0.689	0.000/0.000	0.000/0.000
030ftest	00010	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
031ftest	00010	0 -1	0.800	0.801/0.000	0.786/0.056	0.800	0.662/0.018	1.830/0.527
032ftest	00010	0 -1	0.050	0.052/0.000	0.047/0.016	0.133	0.000/0.000	0.000/0.000
033ftest	00010	0 -1	0.800	0.792/0.000	0.794/0.057	0.733	0.699/0.014	1.440/0.258
034ftest	00010	0 -1	0.800	0.793/0.000	0.996/0.018	1.000	0.752/0.014	1.267/0.267
035ftest	00010	0 -1	0.100	0.102/0.000	0.158/0.009	0.933	0.000/0.000	0.760/0.370
036ftest	00010	0 -1	0.050	0.053/0.000	0.059/0.017	0.244	0.000/0.000	0.000/0.000
037ftest	00010	0 -1	0.800	0.795/0.000	0.927/0.010	1.000	0.729/0.012	1.052/0.098
038ftest	00010	0 -1	0.200	0.202/0.000	0.200/0.017	0.689	0.080/0.014	0.000/0.000
039ftest	00010	0 -1	0.400	0.399/0.000	0.581/0.031	0.867	0.372/0.010	0.599/0.046
040ftest	00010	0 -1	0.200	0.203/0.000	0.270/0.008	0.956	0.098/0.014	0.911/0.389
041ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
042ftest	00100	0 -1	0.200	0.199/0.000	0.267/0.000	1.000	0.197/0.010	0.294/0.005
043ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
044ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
045ftest	00100	0 -1	0.200	0.199/0.000	0.267/0.000	1.000	0.197/0.010	0.294/0.005
046ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
047ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
048ftest	00100	0 -1	0.200	0.199/0.000	0.267/0.000	1.000	0.197/0.010	0.294/0.005
049ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
050ftest	00010	0 -1	0.050	0.051/0.000	0.066/0.007	0.578	0.000/0.000	0.000/0.000
051ftest	00010	0 -1	0.050	0.051/0.000	0.066/0.007	0.578	0.000/0.000	0.000/0.000
052ftest	00010	0 -1	0.050	0.051/0.000	0.066/0.007	0.578	0.000/0.000	0.000/0.000
064ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
076ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
002ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
003ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
004ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
005ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
006ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
007ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
008ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.076/0.093
009ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.155/0.177
010ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	0.302/0.320
011ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.547/0.507
012ftest	00100	0 -1 0.000	0.000/0.000	0.064/0.026	0.200	0.000/0.000	1.031/0.915
013ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
014ftest	00100	0 -1 0.050	0.050/0.000	0.068/0.001	1.000	0.056/0.008	0.064/0.003
015ftest	00100	0 -1 0.100	0.100/0.000	0.134/0.001	1.000	0.117/0.008	0.136/0.005
016ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008	0.281/0.006
017ftest	00100	0 -1 0.400	0.398/0.000	0.503/0.003	1.000	0.426/0.008	0.553/0.005
018ftest	00100	0 -1 0.800	0.798/0.000	0.962/0.011	1.000	0.821/0.010	1.050/0.050
019ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
020ftest	00010	0 -1 0.050	0.049/0.000	0.073/0.002	0.978	0.091/0.008	0.164/0.120
021ftest	00010	0 -1 0.100	0.099/0.000	0.146/0.003	0.978	0.162/0.008	0.323/0.223
022ftest	00010	0 -1 0.200	0.196/0.000	0.279/0.006	0.978	0.293/0.008	0.612/0.397
023ftest	00010	0 -1 0.400	0.395/0.000	0.539/0.012	0.978	0.501/0.011	1.139/0.696
024ftest	00010	0 -1 0.800	0.787/0.000	1.021/0.022	0.978	0.933/0.018	2.122/1.258
025ftest	00100	0 -1 0.800	0.798/0.000	0.962/0.011	1.000	0.821/0.010	1.050/0.050
026ftest	00100	0 -1 0.000	0.000/0.000	0.064/0.026	0.200	0.000/0.000	1.031/0.915
027ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
028ftest	00010	0 -1 0.050	0.048/0.000	0.071/0.002	0.867	0.127/0.014	1.231/1.264
029ftest	00010	0 -1 0.100	0.098/0.000	0.137/0.003	1.000	0.151/0.008	0.213/0.087
030ftest	00010	0 -1 0.100	0.100/0.000	0.130/0.002	1.000	0.139/0.008	0.147/0.038
031ftest	00010	0 -1 0.800	0.787/0.000	1.037/0.032	0.867	0.932/0.014	1.978/0.967
032ftest	00010	0 -1 0.800	0.793/0.000	0.911/0.013	1.000	0.901/0.011	1.126/0.250
033ftest	00010	0 -1 0.400	0.397/0.000	0.582/0.020	0.889	0.517/0.011	1.490/0.904
034ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.043/0.011	1.059/1.069
035ftest	00010	0 -1 0.200	0.196/0.000	0.267/0.004	1.000	0.283/0.011	0.641/0.611
036ftest	00010	0 -1 0.800	0.791/0.000	0.895/0.024	0.978	0.900/0.015	1.271/0.582
037ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.444	0.040/0.010	0.953/0.894
038ftest	00010	0 -1 0.800	0.792/0.000	0.936/0.011	1.000	0.898/0.011	1.276/0.328
039ftest	00010	0 -1 0.050	0.048/0.000	0.063/0.003	0.800	0.087/0.008	0.619/0.512
040ftest	00010	0 -1 0.200	0.195/0.000	0.281/0.006	0.978	0.295/0.012	0.782/0.734
041ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
042ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	0.302/0.320
043ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008	0.281/0.006
044ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
045ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	0.302/0.320
046ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008	0.281/0.006
047ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
048ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	0.302/0.320
049ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008	0.281/0.006
050ftest	00010	0 -1 0.400	0.396/0.000	0.488/0.007	1.000	0.500/0.009	0.660/0.237
051ftest	00010	0 -1 0.400	0.396/0.000	0.488/0.007	1.000	0.500/0.009	0.660/0.237
052ftest	00010	0 -1 0.400	0.396/0.000	0.488/0.007	1.000	0.500/0.009	0.660/0.237
064ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
076ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000

Appendix E: Batch 4 Report

Batch 4. Series of Single, Pure Aroclors from WDL to ADL. October 6, 1997. The Report first lists opinions for Aroclor 1242, then 1254, and 1260. The Aroclor is indicated in the left corner of the title bar. The first column contains the sample identifier. The second column indicates the sample's scenario, in Contamination, None, Single Multiple, and Overconcentration order. The next two columns are obsolete and not titled. The next column contains a single floating point number, which is the Known concentration of the specific Aroclor in the sample. The last five columns are Method opinions, as shown in the title bar. The quantity opinions are presented as two numbers, separated by a "/". The first is the quantity estimate, and the second is the error estimate, if one was provided by the Method. Neural Net for Identity returns a probability between 0 and 1 that the specific Aroclor is present in the sample.

<u>1242</u>	<u>Scenario</u>			<u>Known</u>	<u>MLR</u>	<u>N-NET</u>	<u>N-NET(id)</u>	<u>PCR</u>	<u>PA</u>
001ftest	00100	0	-1	0.100	0.098/0.000	0.140/0.001	1.000	0.134/0.009	0.143/0.005
002ftest	00100	0	-1	0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
003ftest	00100	0	-1	0.300	0.322/0.000	0.410/0.003	1.000	0.403/0.009	0.430/0.023
004ftest	00100	0	-1	0.400	0.393/0.000	0.540/0.007	1.000	0.477/0.009	0.564/0.005
005ftest	00100	0	-1	0.500	0.504/0.000	0.669/0.007	1.000	0.641/0.010	0.714/0.019
006ftest	00100	0	-1	0.600	0.599/0.000	0.798/0.009	1.000	0.751/0.011	0.845/0.031
007ftest	00100	0	-1	0.700	0.790/0.000	0.940/0.010	1.000	0.910/0.012	0.982/0.029
008ftest	00100	0	-1	0.800	0.785/0.000	1.028/0.021	1.000	0.881/0.012	1.029/0.045
009ftest	00101	0	-1	0.900	0.906/0.000	1.130/0.018	1.000	1.053/0.013	1.200/0.000
010ftest	00101	0	-1	1.000	1.012/0.000	1.260/0.020	1.000	1.161/0.014	1.300/0.000
011ftest	00101	0	-1	1.100	1.136/0.000	1.402/0.021	1.000	1.323/0.016	1.500/0.000
012ftest	00101	0	-1	1.200	1.217/0.000	1.521/0.024	1.000	1.399/0.016	1.600/0.000
013ftest	00101	0	-1	1.300	1.339/0.000	1.660/0.025	1.000	1.560/0.018	1.760/0.049
014ftest	00101	0	-1	1.400	1.446/0.000	1.790/0.027	1.000	1.662/0.019	1.900/0.001
015ftest	00101	0	-1	1.500	1.569/0.000	1.932/0.029	1.000	1.826/0.021	2.040/0.049
016ftest	00101	0	-1	1.600	1.570/0.000	2.021/0.041	1.000	1.777/0.020	2.100/0.000
017ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
018ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
019ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	0.028/0.009	0.805/1.051
020ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.963/1.242
021ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.178	0.035/0.009	1.216/1.572
022ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.036/0.010	1.474/1.890
023ftest	00100	0	-1	0.000	0.000/0.000	0.025/0.012	0.200	0.059/0.011	1.742/2.246
024ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	1.765/2.247
025ftest	00101	0	-1	0.000	0.000/0.000	0.028/0.016	0.222	0.041/0.012	2.006/2.559

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA	.
026ftest	00101	0 -1 0.000	0.000/0.000	0.032/0.018	0.244	0.041/0.013	2.263/2.876	
027ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.019	0.222	0.063/0.014	2.559/3.247	
028ftest	00101	0 -1 0.000	0.000/0.000	0.034/0.021	0.244	0.045/0.014	2.713/3.438	
029ftest	00101	0 -1 0.000	0.000/0.000	0.044/0.023	0.244	0.067/0.015	2.967/3.767	
030ftest	00101	0 -1 0.000	0.000/0.000	0.047/0.025	0.244	0.072/0.016	3.236/4.122	
031ftest	00101	0 -1 0.000	0.000/0.000	0.089/0.010	0.689	0.092/0.017	3.536/4.490	
032ftest	00101	0 -1 0.000	0.000/0.000	0.041/0.029	0.200	0.046/0.018	3.557/4.521	
033ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000	
034ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000	
035ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.029/0.009	0.000/0.000	
036ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.000/0.000	0.000/0.000	
037ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.031/0.010	0.000/0.000	
038ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.036/0.011	0.000/0.000	
039ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.054/0.012	0.000/0.000	
040ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.733	0.000/0.000	0.000/0.000	
041ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.040/0.013	0.000/0.000	
042ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.533	0.043/0.014	0.000/0.000	
043ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.311	0.074/0.015	0.000/0.000	
044ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.042/0.015	0.000/0.000	
045ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.064/0.017	0.000/0.000	
046ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.311	0.068/0.018	0.000/0.000	
047ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.099/0.019	0.000/0.000	
048ftest	00101	0 -1 0.000	0.000/0.000	0.042/0.006	0.489	0.052/0.019	0.000/0.000	

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.052/0.069
002ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
003ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.178/0.191
004ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.230/0.239
005ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.293/0.300
006ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.355/0.358
007ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.420/0.420
008ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.447/0.439
009ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.501/0.502
010ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.562/0.561
011ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.626/0.618
012ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.677/0.652
013ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.748/0.737
014ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.807/0.796
015ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.882/0.861
016ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.893/0.854
017ftest	00100	0 -1 0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
018ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.197/0.010	0.294/0.005
019ftest	00100	0 -1 0.300	0.334/0.000	0.392/0.004	1.000	0.277/0.010	0.453/0.016
020ftest	00100	0 -1 0.400	0.398/0.000	0.521/0.009	1.000	0.412/0.010	0.559/0.009
021ftest	00100	0 -1 0.500	0.514/0.000	0.622/0.002	1.000	0.478/0.010	0.704/0.024
022ftest	00100	0 -1 0.600	0.670/0.000	0.753/0.003	1.000	0.591/0.011	0.861/0.021
023ftest	00100	0 -1 0.700	0.796/0.000	0.880/0.004	1.000	0.686/0.012	0.988/0.025
024ftest	00100	0 -1 0.800	0.796/0.000	0.996/0.027	1.000	0.776/0.012	1.000/0.000
025ftest	00101	0 -1 0.900	0.921/0.000	1.053/0.008	1.000	0.881/0.013	1.190/0.030
026ftest	00101	0 -1 1.000	1.030/0.000	1.183/0.010	1.000	0.971/0.014	1.330/0.064
027ftest	00101	0 -1 1.100	1.158/0.000	1.311/0.008	1.000	1.051/0.015	1.489/0.031
028ftest	00101	0 -1 1.200	1.228/0.000	1.431/0.016	1.000	1.165/0.016	1.590/0.030
029ftest	00101	0 -1 1.300	1.354/0.000	1.541/0.011	1.000	1.249/0.017	1.756/0.050
030ftest	00101	0 -1 1.400	1.462/0.000	1.670/0.012	1.000	1.361/0.018	1.910/0.054
031ftest	00101	0 -1 1.500	1.591/0.000	1.798/0.010	1.000	1.431/0.019	2.050/0.081
032ftest	00101	0 -1 1.600	1.591/0.000	1.894/0.029	1.000	1.555/0.020	2.089/0.031
033ftest	00100	C -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
034ftest	00100	0 -1 0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
035ftest	00100	0 -1 0.000	0.000/0.000	0.061/0.047	0.244	0.000/0.000	0.000/0.000
036ftest	00100	0 -1 0.000	0.000/0.000	0.063/0.059	0.156	0.000/0.000	0.000/0.000
037ftest	00100	0 -1 0.000	0.000/0.000	0.089/0.075	0.311	0.000/0.000	0.000/0.000
038ftest	00100	0 -1 0.000	0.000/0.000	0.113/0.094	0.089	0.000/0.000	0.000/0.000
039ftest	00100	0 -1 0.000	0.000/0.000	0.136/0.109	0.333	0.000/0.000	0.000/0.000
040ftest	00100	0 -1 0.000	0.000/0.000	0.117/0.108	0.156	0.000/0.000	0.000/0.000
041ftest	00101	0 -1 0.000	0.000/0.000	0.142/0.125	0.133	0.000/0.000	0.000/0.000
042ftest	00101	0 -1 0.000	0.000/0.000	0.165/0.142	0.156	0.000/0.000	0.000/0.000
043ftest	00101	0 -1 0.000	0.000/0.000	0.190/0.160	0.133	0.000/0.000	0.000/0.000
044ftest	00101	0 -1 0.000	0.000/0.000	0.186/0.168	0.111	0.000/0.000	0.000/0.000
045ftest	00101	0 -1 0.000	0.000/0.000	0.222/0.187	0.133	0.000/0.000	0.000/0.000
046ftest	00101	0 -1 0.000	0.000/0.000	0.240/0.203	0.133	0.000/0.000	0.000/0.000
047ftest	00101	0 -1 0.000	0.025/0.000	0.262/0.220	0.133	0.000/0.000	0.000/0.000
048ftest	00101	0 -1 0.000	0.000/0.000	0.243/0.219	0.178	0.000/0.000	0.000/0.000

1260	Scenario	Known		MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000
002ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000
003ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000
004ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
005ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
006ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000
007ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.038/0.011
008ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
009ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
010ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.029/0.013
011ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.037/0.014
012ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.029/0.014
013ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.045/0.016
014ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.089	0.048/0.017
015ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.089	0.060/0.018
016ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	0.040/0.018
017ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
018ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000
019ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.026/0.008
020ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000
021ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.133	0.027/0.008
022ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.035/0.009
023ftest	00100	0	-1	0.000	0.000/0.000	0.000/0.000	0.089	0.045/0.009
024ftest	00100	0	-1	0.000	0.000/0.000	0.064/0.026	0.200	0.000/0.000
025ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.378	0.034/0.011
026ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.378	0.046/0.011
027ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.089	0.072/0.012
028ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.378	0.052/0.013
029ftest	00101	0	-1	0.000	0.000/0.000	0.000/0.000	0.333	0.071/0.014
030ftest	00101	0	-1	0.000	0.000/0.000	0.036/0.005	0.333	0.079/0.014
031ftest	00101	0	-1	0.000	0.000/0.000	0.040/0.006	0.333	0.102/0.015
032ftest	00101	0	-1	0.000	0.000/0.000	0.104/0.044	0.222	0.061/0.016
033ftest	00100	0	-1	0.100	0.100/0.000	0.134/0.001	1.000	0.117/0.008
034ftest	00100	0	-1	0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008
035ftest	00100	0	-1	0.300	0.329/0.000	0.388/0.006	1.000	0.368/0.008
036ftest	00100	0	-1	0.400	0.398/0.000	0.503/0.003	1.000	0.426/0.008
037ftest	00100	0	-1	0.500	0.509/0.000	0.611/0.008	1.000	0.593/0.009
038ftest	00100	0	-1	0.600	0.652/0.000	0.744/0.008	1.000	0.709/0.009
039ftest	00100	0	-1	0.700	0.771/0.000	0.867/0.014	1.000	0.841/0.010
040ftest	00100	0	-1	0.800	0.798/0.000	0.962/0.011	1.000	0.821/0.010
041ftest	00101	0	-1	0.900	0.910/0.000	1.044/0.014	1.000	1.003/0.011
042ftest	00101	0	-1	1.000	1.020/0.000	1.175/0.014	1.000	1.118/0.012
043ftest	00101	0	-1	1.100	1.138/0.000	1.299/0.018	1.000	1.263/0.013
044ftest	00101	0	-1	1.200	1.211/0.000	1.410/0.015	1.000	1.306/0.014
045ftest	00101	0	-1	1.300	1.332/0.000	1.521/0.023	1.000	1.441/0.015
046ftest	00101	0	-1	1.400	1.442/0.000	1.652/0.022	1.000	1.562/0.016
047ftest	00101	0	-1	1.500	1.559/0.000	1.776/0.028	1.000	1.728/0.017
048ftest	00101	0	-1	1.600	1.579/0.000	1.864/0.019	1.000	1.730/0.017

Appendix F: Batch 5 Report

Combiner Training Set (CTS). 20 samples in each of ten scenarios. The Report first lists opinions for Aroclor 1242, then 1254, and 1260. The Aroclor is indicated in the left corner of the title bar. The first column contains the sample identifier. The second column indicates the sample's scenario, in Contamination, None, Single Multiple, and Overconcentration order. The next two columns are obsolete and not titled. The next column contains a single floating point number, which is the Known concentration of the specific Aroclor in the sample. The last five columns are Method opinions, as shown in the title bar. The quantity opinions are presented as two numbers, separated by a "/". The first is the quantity estimate, and the second is the error estimate, if one was provided by the Method. Neural Net for Identity returns a probability between 0 and 1 that the specific Aroclor is present in the sample.

1242	Scenario			Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0	-1	0.000	0.000/0.000	0.060/0.023	0.178	0.052/0.009	0.240/0.360
002ftest	00010	0	-1	0.700	0.793/0.000	0.955/0.014	1.000	0.967/0.014	1.317/0.474
003ftest	00010	0	-1	0.350	0.382/0.000	0.502/0.010	1.000	0.537/0.011	0.792/0.389
004ftest	00010	0	-1	0.550	0.567/0.000	0.765/0.015	1.000	0.746/0.012	1.353/0.828
005ftest	00010	0	-1	0.350	0.383/0.000	0.494/0.008	1.000	0.544/0.010	0.778/0.392
006ftest	00010	0	-1	0.350	0.378/0.000	0.501/0.010	0.978	0.515/0.012	0.572/0.050
007ftest	00010	0	-1	0.000	0.000/0.000	0.199/0.104	0.200	0.061/0.013	1.126/1.633
008ftest	00010	0	-1	0.750	0.861/0.000	1.042/0.019	1.000	1.062/0.017	1.517/0.626
009ftest	00010	0	-1	0.100	0.100/0.000	0.152/0.003	1.000	0.215/0.010	0.555/0.592
010ftest	00010	0	-1	0.650	0.735/0.000	0.913/0.023	0.978	0.898/0.016	1.840/1.305
011ftest	00010	0	-1	0.850	0.849/0.000	1.095/0.026	1.000	1.014/0.016	2.857/2.244
012ftest	00010	0	-1	0.750	0.861/0.000	1.069/0.029	0.978	1.097/0.021	2.217/1.606
013ftest	00010	0	-1	0.700	0.792/0.000	0.977/0.023	0.978	0.966/0.016	2.743/2.253
014ftest	00010	0	-1	0.550	0.568/0.000	0.792/0.028	0.956	0.746/0.015	2.797/2.535
015ftest	00010	0	-1	0.500	0.506/0.000	0.713/0.020	0.978	0.752/0.015	1.403/0.995
016ftest	00010	0	-1	0.600	0.599/0.000	0.834/0.022	0.978	0.809/0.014	2.581/2.226
017ftest	00010	0	-1	0.200	0.196/0.000	0.275/0.005	1.000	0.287/0.009	0.693/0.534
018ftest	00010	0	-1	0.650	0.735/0.000	0.916/0.024	0.978	0.933/0.017	1.940/1.456
019ftest	00010	0	-1	0.500	0.504/0.000	0.671/0.008	1.000	0.656/0.010	0.705/0.029
020ftest	00010	0	-1	0.350	0.377/0.000	0.501/0.011	0.978	0.532/0.014	0.580/0.055
021ftest	00011	0	-1	0.000	0.000/0.000	0.038/0.016	0.289	0.115/0.016	0.154/0.230
022ftest	00011	0	-1	0.000	0.000/0.000	0.364/0.168	0.133	0.136/0.018	1.791/2.591
023ftest	00011	0	-1	0.000	0.000/0.000	0.317/0.133	0.178	0.144/0.023	1.400/1.937
024ftest	00011	0	-1	1.400	1.445/0.000	1.843/0.035	1.000	1.776/0.028	2.367/0.639
025ftest	00011	0	-1	0.950	0.978/0.000	1.256/0.033	0.978	1.145/0.019	3.500/2.838
026ftest	00011	0	-1	1.600	1.568/0.000	2.115/0.068	0.978	1.927/0.031	3.467/1.954
027ftest	00011	0	-1	1.200	1.216/0.000	1.681/0.065	0.956	1.640/0.037	3.717/2.984
028ftest	00011	0	-1	1.550	1.644/0.000	2.657/0.142	0.956	2.054/0.037	4.283/2.717
029ftest	00011	0	-1	0.000	0.000/0.000	0.152/0.057	0.222	0.148/0.021	0.563/0.734
030ftest	00011	0	-1	1.600	1.569/0.000	2.409/0.099	1.000	1.898/0.033	3.550/1.909
031ftest	00011	0	-1	1.200	1.218/0.000	1.576/0.037	1.000	1.461/0.022	3.986/3.042
032ftest	00011	0	-1	0.900	0.906/0.000	1.135/0.019	1.000	1.093/0.014	1.400/0.332
033ftest	00011	0	-1	1.250	1.285/0.000	1.620/0.029	1.000	1.508/0.022	1.733/0.047
034ftest	00011	0	-1	1.650	1.631/0.000	2.144/0.068	1.000	1.933/0.030	2.267/0.094
035ftest	00011	0	-1	0.000	0.000/0.000	0.257/0.113	0.200	0.144/0.019	1.240/1.775
036ftest	00011	0	-1	0.000	0.000/0.000	0.304/0.158	0.200	0.127/0.021	1.712/2.487
037ftest	00011	0	-1	1.650	1.635/0.000	2.310/0.109	0.978	1.911/0.026	4.314/2.698
038ftest	00011	0	-1	0.400	0.393/0.000	0.611/0.024	0.956	0.585/0.021	0.875/0.352
039ftest	00011	0	-1	1.050	1.081/0.000	1.475/0.066	0.933	1.390/0.029	3.117/2.453
040ftest	00011	0	-1	1.300	1.334/0.000	1.677/0.028	1.000	1.619/0.022	1.800/0.058

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
041ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.029/0.009	0.000/0.000
042ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.054/0.011	0.000/0.000
043ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.031/0.010	0.000/0.000
044ftest	00100	0 -1 0.700	0.790/0.000	0.940/0.010	1.000	0.910/0.012	0.982/0.029
045ftest	00100	0 -1 0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
046ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.054/0.009	0.552/0.825
047ftest	00100	0 -1 0.000	0.000/0.000	0.031/0.027	0.156	0.032/0.009	0.000/0.000
048ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.025/0.009	0.000/0.000
049ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.031/0.010	0.000/0.000
050ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.036/0.010	1.474/1.890
051ftest	00100	0 -1 0.000	0.000/0.000	0.031/0.027	0.156	0.032/0.009	0.000/0.000
052ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.047/0.009	0.000/0.000
053ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
054ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.059/0.010	1.368/1.766
055ftest	00100	0 -1 0.600	0.599/0.000	0.798/0.009	1.000	0.751/0.011	0.845/0.031
056ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.733	0.000/0.000	0.000/0.000
057ftest	00100	0 -1 0.150	0.162/0.000	0.211/0.001	1.000	0.211/0.009	0.222/0.007
058ftest	00100	0 -1 0.650	0.733/0.000	0.869/0.010	1.000	0.817/0.011	0.922/0.035
059ftest	00100	0 -1 0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
060ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.028/0.009	0.805/1.051
061ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.042/0.015	0.000/0.000
062ftest	00101	0 -1 1.700	1.686/0.000	2.124/0.037	1.000	1.974/0.022	2.220/0.040
063ftest	00101	0 -1 1.550	1.644/0.000	2.022/0.042	1.000	1.851/0.021	2.140/0.049
064ftest	00101	0 -1 1.600	1.570/0.000	2.021/0.041	1.000	1.777/0.020	2.100/0.000
065ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.116/0.020	0.000/0.000
066ftest	00101	0 -1 0.000	0.000/0.000	0.060/0.028	0.244	0.099/0.018	3.612/4.553
067ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.088/0.019	0.000/0.000
068ftest	00101	0 -1 0.000	0.000/0.000	0.085/0.010	0.622	0.088/0.016	3.062/3.825
069ftest	00101	0 -1 1.350	1.412/0.000	1.731/0.026	1.000	1.591/0.018	1.840/0.049
070ftest	00101	0 -1 0.000	0.000/0.000	0.031/0.012	0.289	0.071/0.021	0.000/0.000
071ftest	00101	0 -1 0.000	0.000/0.000	0.085/0.010	0.622	0.088/0.016	3.062/3.825
072ftest	00101	0 -1 1.500	1.569/0.000	1.932/0.029	1.000	1.826/0.021	2.040/0.049
073ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.084/0.018	0.000/0.000
074ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.084/0.018	0.000/0.000
075ftest	00101	0 -1 0.950	0.975/0.000	1.201/0.019	1.000	1.101/0.014	1.243/0.049
076ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.084/0.018	0.000/0.000
077ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.091/0.016	0.000/0.000
078ftest	00101	0 -1 1.400	1.446/0.000	1.790/0.027	1.000	1.662/0.019	1.900/0.001
079ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.042/0.015	0.000/0.000
080ftest	00101	0 -1 0.900	0.906/0.000	1.130/0.018	1.000	1.053/0.013	1.200/0.000
081ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
082ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
083ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
084ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
085ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
086ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
087ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
088ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
089ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
090ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
091ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
092ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
093ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
094ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
095ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
096ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
097ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
098ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
099ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
100ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
101ftest	10010	0 -1 0.300	0.388/0.000	1.147/0.590	0.578	2.891/0.045	2.386/2.396
102ftest	10010	0 -1 0.750	0.906/0.000	1.537/0.366	0.489	2.384/0.064	0.000/0.000
103ftest	10010	0 -1 0.550	0.670/0.000	0.794/0.034	0.911	2.972/0.082	2.341/1.974
104ftest	10010	0 -1 0.000	0.000/0.000	0.118/0.057	0.200	0.457/0.019	0.738/0.966
105ftest	10010	0 -1 0.500	0.576/0.000	1.910/0.599	0.422	2.156/0.038	0.740/0.025
106ftest	10010	0 -1 0.700	0.905/0.000	2.297/0.533	0.356	2.469/0.030	1.650/0.797
107ftest	10010	0 -1 0.150	0.250/0.000	1.258/0.479	0.400	0.000/0.000	0.683/0.513
108ftest	10010	0 -1 0.700	0.917/0.000	1.445/0.347	0.556	0.068/0.021	3.443/2.943
109ftest	10010	0 -1 0.000	0.093/0.000	1.115/0.453	0.133	0.311/0.031	1.480/1.607
110ftest	10010	0 -1 0.750	0.894/0.000	1.905/0.460	0.622	0.000/0.000	2.433/1.623
111ftest	10010	0 -1 0.000	0.046/0.000	1.490/0.629	0.089	0.814/0.019	0.000/0.000
112ftest	10010	0 -1 0.350	0.408/0.000	0.682/0.166	0.667	1.848/0.028	1.760/1.705
113ftest	10010	0 -1 0.350	0.409/0.000	2.412/1.166	0.311	0.247/0.029	0.000/0.000
114ftest	10010	0 -1 0.300	0.358/0.000	1.023/0.265	0.467	0.000/0.000	0.976/0.524
115ftest	10010	0 -1 0.400	0.427/0.000	1.556/0.823	0.667	0.787/0.023	1.323/0.883
116ftest	10010	0 -1 0.150	0.169/0.000	0.214/0.002	1.000	0.714/0.022	0.000/0.000
117ftest	10010	0 -1 0.800	0.810/0.000	1.417/0.095	0.800	1.967/0.035	1.983/1.035
118ftest	10010	0 -1 0.450	0.600/0.000	0.989/0.325	0.578	0.000/0.000	1.521/1.128
119ftest	10010	0 -1 0.850	0.853/0.000	1.735/0.433	0.622	1.601/0.027	2.043/0.985
120ftest	10010	0 -1 0.100	0.136/0.000	0.833/0.332	0.333	0.000/0.000	0.000/0.000
121ftest	10011	0 -1 1.550	1.702/0.000	2.060/0.040	1.000	2.300/0.049	2.300/0.200
122ftest	10011	0 -1 1.150	1.201/0.000	2.817/0.709	0.400	1.716/0.054	0.000/0.000
123ftest	10011	0 -1 1.500	1.594/0.000	2.154/0.054	0.978	0.000/0.000	5.800/4.447
124ftest	10011	0 -1 0.950	0.990/0.000	2.106/0.375	0.511	2.250/0.064	4.429/3.719
125ftest	10011	0 -1 1.150	1.294/0.000	1.561/0.030	1.000	0.505/0.037	4.014/2.960
126ftest	10011	0 -1 0.900	0.903/0.000	1.224/0.047	0.933	2.691/0.052	3.143/2.842
127ftest	10011	0 -1 1.400	1.527/0.000	1.994/0.033	1.000	0.042/0.009	5.000/3.813
128ftest	10011	0 -1 0.000	0.041/0.000	1.243/0.462	0.156	1.280/0.025	2.109/3.031
129ftest	10011	0 -1 1.000	1.009/0.000	3.034/0.879	0.511	4.354/0.092	6.471/6.716
130ftest	10011	0 -1 0.950	0.999/0.000	1.610/0.106	0.844	0.000/0.000	0.000/0.000
131ftest	10011	0 -1 1.200	1.239/0.000	1.619/0.034	0.978	2.846/0.048	3.333/2.073
132ftest	10011	0 -1 1.150	1.444/0.000	3.161/0.706	0.533	3.203/0.043	4.000/2.841
133ftest	10011	0 -1 1.000	1.075/0.000	1.836/0.127	0.800	0.000/0.000	3.183/1.720
134ftest	10011	0 -1 0.000	0.054/0.000	0.862/0.354	0.156	1.905/0.049	0.000/0.000
135ftest	10011	0 -1 1.700	1.705/0.000	2.180/0.045	1.000	2.397/0.039	4.033/2.213
136ftest	10011	0 -1 1.150	1.291/0.000	1.590/0.064	0.933	4.571/0.073	3.600/2.371
137ftest	10011	0 -1 1.450	1.614/0.000	2.420/0.249	0.644	0.892/0.043	4.217/2.159
138ftest	10011	0 -1 0.000	0.036/0.000	1.769/0.571	0.289	0.000/0.000	2.244/3.225
139ftest	10011	0 -1 1.150	1.219/0.000	2.012/0.086	0.889	0.000/0.000	3.767/2.635
140ftest	10011	0 -1 0.950	1.090/0.000	2.854/0.572	0.289	2.929/0.042	2.750/2.205
141ftest	10100	0 -1 0.000	0.046/0.000	1.386/0.801	0.156	0.000/0.000	2.031/2.609
142ftest	10100	0 -1 0.000	0.054/0.000	0.754/0.239	0.267	0.981/0.016	0.000/0.000
143ftest	10100	0 -1 0.000	0.043/0.000	1.841/0.866	0.156	1.326/0.033	0.000/0.000
144ftest	10100	0 -1 0.000	0.029/0.000	1.073/0.465	0.178	0.544/0.020	0.000/0.000
145ftest	10100	0 -1 0.000	0.000/0.000	0.101/0.088	0.200	0.545/0.010	0.000/0.000
146ftest	10100	0 -1 0.000	0.058/0.000	0.405/0.299	0.156	0.871/0.032	0.000/0.000
147ftest	10100	0 -1 0.000	0.097/0.000	2.842/0.742	0.222	3.812/0.090	0.000/0.000
148ftest	10100	0 -1 0.000	0.032/0.000	0.675/0.320	0.067	0.541/0.015	0.000/0.000
149ftest	10100	0 -1 0.700	0.899/0.000	0.924/0.014	1.000	1.408/0.042	0.000/0.000
150ftest	10100	0 -1 0.000	0.030/0.000	1.354/0.856	0.156	0.000/0.000	0.000/0.000

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
151ftest	10100	0 -1 0.000	0.046/0.000	0.333/0.231	0.089	0.868/0.042	0.000/0.000
152ftest	10100	0 -1 0.000	0.000/0.000	0.425/0.399	0.067	0.477/0.014	0.000/0.000
153ftest	10100	0 -1 0.000	0.042/0.000	0.311/0.289	0.267	0.000/0.000	0.000/0.000
154ftest	10100	0 -1 0.250	0.263/0.000	0.338/0.003	1.000	0.576/0.012	0.352/0.023
155ftest	10100	0 -1 0.300	0.323/0.000	0.411/0.005	1.000	1.906/0.027	0.435/0.021
156ftest	10100	0 -1 0.000	0.000/0.000	0.063/0.053	0.200	0.415/0.027	1.229/1.588
157ftest	10100	0 -1 0.000	0.000/0.000	0.053/0.044	0.178	0.107/0.010	0.000/0.000
158ftest	10100	0 -1 0.100	0.123/0.000	0.432/0.193	0.644	0.318/0.029	0.142/0.004
159ftest	10100	0 -1 0.650	0.766/0.000	1.623/0.498	0.556	3.361/0.043	1.162/0.266
160ftest	10100	0 -1 0.000	0.061/0.000	0.184/0.098	0.222	0.000/0.000	0.000/0.000
161ftest	10101	0 -1 1.250	1.299/0.000	1.638/0.050	1.000	1.707/0.019	1.650/0.050
162ftest	10101	0 -1 0.900	0.995/0.000	1.275/0.071	0.889	0.476/0.034	1.167/0.047
163ftest	10101	0 -1 0.000	0.065/0.000	0.497/0.250	0.133	1.639/0.041	0.000/0.000
164ftest	10101	0 -1 1.100	1.185/0.000	1.443/0.020	1.000	1.364/0.026	0.000/0.000
165ftest	10101	0 -1 0.000	0.000/0.000	0.096/0.011	0.667	0.000/0.000	3.613/4.552
166ftest	10101	0 -1 0.000	0.127/0.000	0.563/0.218	0.222	0.431/0.018	0.000/0.000
167ftest	10101	0 -1 0.000	0.041/0.000	1.101/0.489	0.133	1.324/0.024	3.052/3.721
168ftest	10101	0 -1 1.150	1.229/0.000	1.476/0.020	1.000	1.312/0.019	1.567/0.094
169ftest	10101	0 -1 0.000	0.107/0.000	2.170/0.815	0.089	1.713/0.034	0.000/0.000
170ftest	10101	0 -1 0.000	0.039/0.000	0.402/0.330	0.156	0.706/0.037	2.203/3.247
171ftest	10101	0 -1 0.000	0.031/0.000	0.240/0.113	0.178	0.336/0.021	0.000/0.000
172ftest	10101	0 -1 0.000	0.000/0.000	0.047/0.025	0.244	0.072/0.016	3.236/4.122
173ftest	10101	0 -1 0.000	0.000/0.000	0.120/0.054	0.178	0.302/0.017	0.000/0.000
174ftest	10101	0 -1 0.000	0.000/0.000	0.133/0.090	0.244	0.488/0.033	0.000/0.000
175ftest	10101	0 -1 0.000	0.000/0.000	0.033/0.024	0.133	1.562/0.029	3.339/4.279
176ftest	10101	0 -1 0.000	0.049/0.000	0.265/0.152	0.133	0.000/0.000	4.266/5.344
177ftest	10101	0 -1 0.000	0.063/0.000	1.520/0.771	0.089	2.625/0.056	0.000/0.000
178ftest	10101	0 -1 1.650	1.655/0.000	2.030/0.037	1.000	2.822/0.041	2.150/0.138
179ftest	10101	0 -1 1.650	1.657/0.000	2.730/0.454	0.644	2.304/0.062	2.271/0.255
180ftest	10101	0 -1 0.000	0.000/0.000	0.313/0.185	0.133	0.364/0.021	0.000/0.000
181ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
182ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
183ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
184ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
185ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
186ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
187ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
188ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
189ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
190ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
191ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
192ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
193ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
194ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
195ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
196ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
197ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
198ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
199ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
200ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA	
001ftest	00010	0 -1	0.150	0.161/0.000	0.181/0.011	0.756	0.071/0.009	0.304/0.086
002ftest	00010	0 -1	0.200	0.194/0.000	0.260/0.011	0.956	0.053/0.015	0.941/0.389
003ftest	00010	0 -1	0.150	0.161/0.000	0.169/0.012	0.733	0.000/0.000	0.756/0.268
004ftest	00010	0 -1	0.400	0.396/0.000	0.561/0.030	0.889	0.305/0.013	0.974/0.314
005ftest	00010	0 -1	0.150	0.160/0.000	0.193/0.010	0.844	0.000/0.000	0.589/0.198
006ftest	00010	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.000/0.000
007ftest	00010	0 -1	0.800	0.801/0.000	0.746/0.043	0.778	0.696/0.014	1.322/0.278
008ftest	00010	0 -1	0.250	0.253/0.000	0.331/0.022	0.689	0.000/0.000	1.297/0.460
009ftest	00010	0 -1	0.250	0.254/0.000	0.285/0.020	0.711	0.114/0.011	0.717/0.222
010ftest	00010	0 -1	0.600	0.670/0.000	0.644/0.041	0.778	0.409/0.017	1.556/0.362
011ftest	00010	0 -1	0.700	0.798/0.000	0.875/0.007	1.000	0.640/0.017	1.489/0.482
012ftest	00010	0 -1	0.700	0.800/0.000	0.743/0.044	0.822	0.388/0.023	2.089/0.534
013ftest	00010	0 -1	0.700	0.792/0.000	0.876/0.006	1.000	0.648/0.017	1.467/0.462
014ftest	00010	0 -1	0.900	0.916/0.000	1.046/0.010	1.000	0.838/0.017	1.522/0.379
015ftest	00010	0 -1	0.450	0.457/0.000	0.455/0.036	0.689	0.224/0.017	1.465/0.359
016ftest	00010	0 -1	0.700	0.796/0.000	0.872/0.006	1.000	0.661/0.016	1.378/0.391
017ftest	00010	0 -1	0.150	0.161/0.000	0.200/0.004	1.000	0.107/0.010	0.351/0.128
018ftest	00010	0 -1	0.650	0.737/0.000	0.704/0.047	0.800	0.408/0.018	1.678/0.388
019ftest	00010	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.337/0.281
020ftest	00010	0 -1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
021ftest	00011	0 -1	0.050	0.066/0.000	0.064/0.019	0.222	0.000/0.000	0.000/0.000
022ftest	00011	0 -1	1.250	1.311/0.000	1.182/0.086	0.689	1.072/0.020	2.170/0.473
023ftest	00011	0 -1	0.900	0.936/0.000	0.867/0.048	0.822	0.646/0.025	1.967/0.762
024ftest	00011	0 -1	0.250	0.267/0.000	0.260/0.014	0.800	0.000/0.000	2.060/0.841
025ftest	00011	0 -1	1.000	1.032/0.000	1.174/0.013	1.000	0.903/0.021	1.878/0.571
026ftest	00011	0 -1	0.950	1.006/0.000	0.922/0.063	0.711	0.529/0.034	2.889/0.778
027ftest	00011	0 -1	1.450	1.547/0.000	1.393/0.106	0.689	0.885/0.040	4.271/0.715
028ftest	00011	0 -1	1.350	1.436/0.000	1.248/0.057	0.867	0.819/0.041	3.811/0.948
029ftest	00011	0 -1	0.250	0.276/0.000	0.306/0.031	0.622	0.000/0.000	0.000/0.000
030ftest	00011	0 -1	0.900	0.941/0.000	0.810/0.045	0.867	0.558/0.036	3.067/0.899
031ftest	00011	0 -1	1.050	1.097/0.000	1.244/0.014	1.000	0.935/0.024	2.100/0.686
032ftest	00011	0 -1	0.150	0.162/0.000	0.207/0.004	0.956	0.076/0.015	0.740/0.498
033ftest	00011	0 -1	0.000	0.000/0.000	0.025/0.010	0.156	0.000/0.000	0.000/0.000
034ftest	00011	0 -1	0.000	0.000/0.000	0.037/0.015	0.156	0.000/0.000	0.000/0.000
035ftest	00011	0 -1	0.850	0.877/0.000	0.769/0.070	0.689	0.611/0.021	1.711/0.608
036ftest	00011	0 -1	1.200	1.247/0.000	1.110/0.085	0.689	1.015/0.023	2.133/0.604
037ftest	00011	0 -1	0.950	0.990/0.000	1.100/0.015	1.000	0.819/0.028	2.222/0.932
038ftest	00011	0 -1	0.100	0.107/0.000	0.103/0.032	0.178	0.000/0.000	0.000/0.000
039ftest	00011	0 -1	1.200	1.245/0.000	1.126/0.080	0.689	0.744/0.032	3.078/0.741
040ftest	00011	0 -1	0.000	0.000/0.000	0.036/0.011	0.244	0.000/0.000	0.000/0.000
041ftest	00100	0 -1	0.000	0.000/0.000	0.061/0.047	0.244	0.000/0.000	0.000/0.000
042ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.006	0.489	0.000/0.000	0.000/0.000
043ftest	00100	0 -1	0.000	0.000/0.000	0.081/0.068	0.422	0.000/0.000	0.000/0.000
044ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.420/0.420
045ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
046ftest	00100	0 -1	0.350	0.393/0.000	0.457/0.007	1.000	0.310/0.010	0.536/0.021
047ftest	00100	0 -1	0.250	0.254/0.000	0.324/0.004	1.000	0.216/0.010	0.368/0.019
048ftest	00100	0 -1	0.000	0.000/0.000	0.045/0.024	0.178	0.000/0.000	0.000/0.000
049ftest	00100	0 -1	0.000	0.000/0.000	0.081/0.068	0.422	0.000/0.000	0.000/0.000
050ftest	00100	0 -1	0.600	0.670/0.000	0.753/0.003	1.000	0.591/0.011	0.861/0.021
051ftest	00100	0 -1	0.250	0.254/0.000	0.324/0.004	1.000	0.216/0.010	0.368/0.019
052ftest	00100	0 -1	0.000	0.000/0.000	0.083/0.057	0.244	0.000/0.000	0.000/0.000
053ftest	00100	0 -1	0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
054ftest	00100	0 -1	0.550	0.574/0.000	0.687/0.004	1.000	0.511/0.011	0.785/0.033
055ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.355/0.358

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
056ftest	00100	0 -1 0.000	0.000/0.000	0.117/0.108	0.156	0.000/0.000	0.000/0.000
057ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.086/0.102
058ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.389/0.390
059ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
060ftest	00100	0 -1 0.300	0.334/0.000	0.392/0.004	1.000	0.277/0.010	0.453/0.016
061ftest	00101	0 -1 0.000	0.000/0.000	0.186/0.168	0.111	0.000/0.000	0.000/0.000
062ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.948/0.916
063ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.903/0.881
064ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.893/0.854
065ftest	00101	0 -1 0.000	0.028/0.000	0.261/0.225	0.133	0.000/0.000	0.000/0.000
066ftest	00101	0 -1 1.550	1.655/0.000	1.863/0.010	1.000	1.486/0.019	2.156/0.050
067ftest	00101	0 -1 0.000	0.000/0.000	0.254/0.212	0.133	0.000/0.000	0.000/0.000
068ftest	00101	0 -1 1.350	1.418/0.000	1.605/0.010	1.000	1.303/0.017	1.830/0.064
069ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.781/0.765
070ftest	00101	0 -1 0.000	0.000/0.000	0.282/0.238	0.156	0.000/0.000	0.000/0.000
071ftest	00101	0 -1 1.350	1.418/0.000	1.605/0.010	1.000	1.303/0.017	1.830/0.064
072ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.882/0.861
073ftest	00101	0 -1 0.000	0.000/0.000	0.237/0.197	0.133	0.000/0.000	0.000/0.000
074ftest	00101	0 -1 0.000	0.000/0.000	0.237/0.197	0.133	0.000/0.000	0.000/0.000
075ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.537/0.530
076ftest	00101	0 -1 0.000	0.000/0.000	0.237/0.197	0.133	0.000/0.000	0.000/0.000
077ftest	00101	0 -1 0.000	0.000/0.000	0.205/0.169	0.133	0.000/0.000	0.000/0.000
078ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.807/0.796
079ftest	00101	0 -1 0.000	0.000/0.000	0.186/0.168	0.111	0.000/0.000	0.000/0.000
080ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.501/0.502
081ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
082ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
083ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
084ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
085ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
086ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
087ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
088ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
089ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
090ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
091ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
092ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
093ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
094ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
095ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
096ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
097ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
098ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
099ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
100ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
101ftest	10010	0 -1 0.500	0.516/0.000	0.775/0.077	0.667	0.314/0.049	1.120/0.328
102ftest	10010	0 -1 0.300	0.276/0.000	1.439/0.379	0.378	0.000/0.000	1.482/0.642
103ftest	10010	0 -1 0.300	0.415/0.000	1.011/0.047	0.822	0.000/0.000	0.000/0.000
104ftest	10010	0 -1 0.350	0.423/0.000	0.403/0.023	0.778	0.000/0.000	0.951/0.374
105ftest	10010	0 -1 0.000	0.035/0.000	0.612/0.176	0.200	0.000/0.000	0.000/0.000
106ftest	10010	0 -1 0.400	0.348/0.000	1.169/0.258	0.489	0.000/0.000	1.349/0.665
107ftest	10010	0 -1 0.200	0.228/0.000	0.291/0.018	0.733	0.000/0.000	0.000/0.000
108ftest	10010	0 -1 0.650	0.807/0.000	1.786/0.236	0.511	1.909/0.023	2.078/0.514
109ftest	10010	0 -1 0.700	0.825/0.000	1.285/0.204	0.600	2.827/0.034	1.244/0.306
110ftest	10010	0 -1 0.800	0.864/0.000	1.861/0.443	0.556	0.000/0.000	1.922/0.527

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
111ftest	10010	0 -1 0.700	0.766/0.000	1.324/0.194	0.644	1.016/0.021	1.178/0.169
112ftest	10010	0 -1 0.850	0.846/0.000	1.450/0.163	0.600	0.000/0.000	1.700/0.389
113ftest	10010	0 -1 0.350	0.404/0.000	0.445/0.029	0.711	0.000/0.000	0.000/0.000
114ftest	10010	0 -1 0.150	0.165/0.000	0.692/0.335	0.556	0.000/0.000	0.000/0.000
115ftest	10010	0 -1 0.300	0.344/0.000	1.368/0.338	0.378	1.642/0.025	1.268/0.456
116ftest	10010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
117ftest	10010	0 -1 0.450	0.453/0.000	0.433/0.021	0.822	0.000/0.000	1.726/0.566
118ftest	10010	0 -1 0.000	0.000/0.000	1.299/0.569	0.222	0.103/0.011	0.000/0.000
119ftest	10010	0 -1 0.200	0.227/0.000	0.636/0.174	0.467	0.000/0.000	0.000/0.000
120ftest	10010	0 -1 0.600	0.684/0.000	0.799/0.136	0.622	1.229/0.039	0.000/0.000
121ftest	10011	0 -1 0.000	0.032/0.000	0.000/0.000	0.111	0.173/0.054	0.000/0.000
122ftest	10011	0 -1 0.000	0.043/0.000	2.316/0.728	0.267	0.000/0.000	0.000/0.000
123ftest	10011	0 -1 1.700	1.752/0.000	2.372/0.098	0.956	3.986/0.045	3.178/0.959
124ftest	10011	0 -1 1.250	1.256/0.000	2.747/0.734	0.467	5.124/0.070	2.544/0.538
125ftest	10011	0 -1 1.050	1.068/0.000	1.203/0.021	1.000	3.366/0.041	2.300/1.270
126ftest	10011	0 -1 0.100	0.247/0.000	0.335/0.172	0.133	0.000/0.000	0.000/0.000
127ftest	10011	0 -1 1.350	1.398/0.000	1.944/0.067	0.956	0.000/0.000	2.722/0.882
128ftest	10011	0 -1 1.450	1.533/0.000	2.872/0.470	0.511	0.000/0.000	2.390/0.298
129ftest	10011	0 -1 1.400	1.607/0.000	3.931/0.579	0.400	0.000/0.000	3.967/0.997
130ftest	10011	0 -1 0.000	0.000/0.000	0.335/0.300	0.111	0.000/0.000	0.000/0.000
131ftest	10011	0 -1 1.050	1.074/0.000	1.761/0.066	0.956	0.390/0.052	2.411/0.574
132ftest	10011	0 -1 1.650	1.602/0.000	2.260/0.262	0.600	0.000/0.000	3.222/1.180
133ftest	10011	0 -1 0.500	0.525/0.000	0.909/0.082	0.689	2.242/0.027	2.567/1.055
134ftest	10011	0 -1 1.300	1.352/0.000	3.522/0.667	0.400	0.000/0.000	2.444/0.631
135ftest	10011	0 -1 1.100	1.192/0.000	0.954/0.125	0.622	0.622/0.043	3.189/0.894
136ftest	10011	0 -1 0.000	0.000/0.000	0.831/0.291	0.111	0.000/0.000	0.000/0.000
137ftest	10011	0 -1 1.100	1.249/0.000	4.756/1.210	0.333	0.000/0.000	0.000/0.000
138ftest	10011	0 -1 1.600	1.683/0.000	3.722/0.642	0.467	0.226/0.027	3.156/0.790
139ftest	10011	0 -1 1.350	1.472/0.000	1.856/0.052	0.956	3.371/0.040	2.544/0.723
140ftest	10011	0 -1 1.050	1.082/0.000	4.065/0.894	0.356	0.000/0.000	3.271/0.863
141ftest	10100	0 -1 0.700	0.833/0.000	1.365/0.411	0.667	3.737/0.047	1.159/0.175
142ftest	10100	0 -1 0.000	0.000/0.000	0.349/0.112	0.222	0.000/0.000	0.000/0.000
143ftest	10100	0 -1 0.000	0.000/0.000	0.150/0.099	0.111	0.366/0.037	0.000/0.000
144ftest	10100	0 -1 0.750	0.970/0.000	2.002/0.678	0.333	1.454/0.022	1.375/0.268
145ftest	10100	0 -1 0.000	0.048/0.000	0.114/0.101	0.178	0.090/0.011	0.000/0.000
146ftest	10100	0 -1 0.000	0.000/0.000	0.112/0.089	0.244	0.000/0.000	0.000/0.000
147ftest	10100	0 -1 0.750	0.856/0.000	1.419/0.260	0.556	0.000/0.000	1.064/0.069
148ftest	10100	0 -1 0.000	0.000/0.000	1.046/0.313	0.244	0.000/0.000	0.000/0.000
149ftest	10100	0 -1 0.000	0.000/0.000	0.239/0.113	0.133	0.000/0.000	0.000/0.000
150ftest	10100	0 -1 0.000	0.000/0.000	1.106/0.527	0.111	0.000/0.000	0.000/0.000
151ftest	10100	0 -1 0.600	0.597/0.000	0.796/0.019	1.000	0.000/0.000	0.876/0.055
152ftest	10100	0 -1 0.400	0.444/0.000	0.521/0.009	1.000	1.032/0.016	0.000/0.000
153ftest	10100	0 -1 0.000	0.000/0.000	0.134/0.106	0.111	2.506/0.040	0.000/0.000
154ftest	10100	0 -1 0.000	0.000/0.000	0.246/0.226	0.067	0.000/0.000	0.206/0.213
155ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.178/0.191
156ftest	10100	0 -1 0.450	0.465/0.000	0.584/0.022	0.911	0.687/0.029	0.632/0.048
157ftest	10100	0 -1 0.500	0.475/0.000	0.622/0.002	1.000	0.482/0.010	0.709/0.018
158ftest	10100	0 -1 0.000	0.000/0.000	0.377/0.232	0.267	0.000/0.000	0.084/0.123
159ftest	10100	0 -1 0.000	0.000/0.000	0.137/0.026	0.311	0.000/0.000	0.482/0.521
160ftest	10100	0 -1 0.000	0.000/0.000	0.145/0.070	0.200	0.000/0.000	0.000/0.000
161ftest	10101	0 -1 0.000	0.000/0.000	0.077/0.044	0.022	0.152/0.021	0.000/0.000
162ftest	10101	0 -1 0.000	0.026/0.000	0.917/0.539	0.067	2.911/0.037	0.000/0.000
163ftest	10101	0 -1 0.000	0.028/0.000	0.320/0.224	0.156	0.000/0.000	0.000/0.000
164ftest	10101	0 -1 0.000	0.047/0.000	0.965/0.123	0.489	0.000/0.000	0.000/0.000
165ftest	10101	0 -1 1.650	1.713/0.000	2.107/0.106	0.889	0.000/0.000	2.189/0.120

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
166ftest	10101	0 -1	1.050	1.096/0.000	1.566/0.351	0.622	1.486/0.020 1.489/0.152
167ftest	10101	0 -1	1.300	1.360/0.000	1.606/0.039	0.956	0.000/0.000 1.844/0.150
168ftest	10101	0 -1	0.000	0.000/0.000	0.239/0.164	0.133	0.838/0.021 0.736/0.644
169ftest	10101	0 -1	1.300	1.375/0.000	1.536/0.015	1.000	1.354/0.037 1.910/0.305
170ftest	10101	0 -1	1.550	1.652/0.000	1.880/0.018	1.000	0.571/0.041 2.167/0.067
171ftest	10101	0 -1	1.600	1.605/0.000	1.917/0.038	0.956	1.606/0.023 2.100/0.047
172ftest	10101	0 -1	1.400	1.459/0.000	1.670/0.012	1.000	1.361/0.018 1.910/0.054
173ftest	10101	0 -1	0.000	0.027/0.000	0.240/0.192	0.111	0.000/0.000 0.000/0.000
174ftest	10101	0 -1	0.000	0.029/0.000	0.420/0.317	0.156	0.000/0.000 0.000/0.000
175ftest	10101	0 -1	1.300	1.360/0.000	1.656/0.073	0.778	0.000/0.000 1.733/0.067
176ftest	10101	0 -1	1.550	1.660/0.000	1.806/0.023	1.000	4.194/0.050 2.189/0.223
177ftest	10101	0 -1	1.100	1.225/0.000	1.327/0.049	0.933	3.987/0.061 0.000/0.000
178ftest	10101	0 -1	0.000	0.000/0.000	0.061/0.003	0.911	0.000/0.000 0.907/0.879
179ftest	10101	0 -1	0.000	0.000/0.000	1.462/0.758	0.178	3.411/0.068 0.000/0.000
180ftest	10101	0 -1	0.000	0.000/0.000	0.516/0.281	0.111	0.000/0.000 0.000/0.000
181ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
182ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
183ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
184ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
185ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
186ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
187ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
188ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
189ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
190ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
191ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
192ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
193ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
194ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
195ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
196ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
197ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
198ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
199ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
200ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0 -1 0.100	0.098/0.000	0.152/0.005	0.867	0.171/0.008	0.367/0.252
002ftest	00010	0 -1 0.250	0.258/0.000	0.350/0.007	1.000	0.411/0.012	0.846/0.716
003ftest	00010	0 -1 0.400	0.396/0.000	0.495/0.008	1.000	0.552/0.010	0.866/0.463
004ftest	00010	0 -1 0.100	0.100/0.000	0.128/0.006	0.778	0.210/0.011	0.802/0.784
005ftest	00010	0 -1 0.150	0.162/0.000	0.221/0.005	1.000	0.308/0.009	0.561/0.469
006ftest	00010	0 -1 0.600	0.653/0.000	0.735/0.012	1.000	0.741/0.011	0.896/0.252
007ftest	00010	0 -1 0.500	0.504/0.000	0.728/0.022	0.933	0.643/0.012	1.687/0.888
008ftest	00010	0 -1 0.550	0.573/0.000	0.716/0.011	1.000	0.788/0.015	1.341/0.840
009ftest	00010	0 -1 0.300	0.330/0.000	0.421/0.008	1.000	0.457/0.009	0.820/0.442
010ftest	00010	0 -1 0.400	0.392/0.000	0.572/0.018	0.956	0.592/0.014	1.511/1.118
011ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.100/0.014	1.209/1.378
012ftest	00010	0 -1 0.850	0.847/0.000	1.081/0.020	0.978	1.127/0.019	2.244/1.355
013ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.117/0.014	1.187/1.330
014ftest	00010	0 -1 0.000	0.000/0.000	0.029/0.004	0.311	0.093/0.013	1.273/1.315
015ftest	00010	0 -1 0.550	0.571/0.000	0.745/0.015	1.000	0.777/0.013	1.466/0.850
016ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.101/0.013	1.163/1.284
017ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.043/0.008	0.289/0.353
018ftest	00010	0 -1 0.450	0.453/0.000	0.648/0.019	0.956	0.693/0.015	1.663/1.199
019ftest	00010	0 -1 0.050	0.051/0.000	0.068/0.002	1.000	0.098/0.009	0.000/0.000
020ftest	00010	0 -1 0.700	0.775/0.000	0.866/0.014	1.000	0.877/0.012	1.038/0.273
021ftest	00011	0 -1 1.150	1.203/0.000	1.365/0.021	1.000	1.371/0.014	1.544/0.126
022ftest	00011	0 -1 0.650	0.702/0.000	0.970/0.032	0.933	0.902/0.016	2.400/1.431
023ftest	00011	0 -1 1.450	1.504/0.000	1.859/0.037	1.000	1.732/0.020	2.944/0.997
024ftest	00011	0 -1 1.200	1.208/0.000	1.404/0.030	1.000	1.494/0.025	2.289/1.215
025ftest	00011	0 -1 0.000	0.000/0.000	0.031/0.004	0.356	0.107/0.017	1.498/1.624
026ftest	00011	0 -1 0.950	0.962/0.000	1.235/0.025	0.978	1.282/0.027	2.800/1.930
027ftest	00011	0 -1 1.550	1.621/0.000	2.065/0.047	0.978	2.062/0.033	4.156/2.318
028ftest	00011	0 -1 1.300	1.321/0.000	1.765/0.063	0.844	1.748/0.033	3.856/2.423
029ftest	00011	0 -1 1.500	1.558/0.000	1.812/0.025	1.000	1.809/0.018	2.278/0.382
030ftest	00011	0 -1 1.250	1.266/0.000	1.615/0.041	0.956	1.557/0.029	3.144/1.887
031ftest	00011	0 -1 0.000	0.000/0.000	0.031/0.004	0.311	0.126/0.019	1.640/1.822
032ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.060/0.012	0.000/0.000
033ftest	00011	0 -1 0.900	0.910/0.000	1.013/0.032	0.978	1.066/0.020	1.456/0.796
034ftest	00011	0 -1 1.400	1.442/0.000	1.605/0.048	0.978	1.658/0.027	2.222/1.021
035ftest	00011	0 -1 1.150	1.196/0.000	1.502/0.036	0.978	1.413/0.017	2.511/0.937
036ftest	00011	0 -1 1.100	1.127/0.000	1.495/0.052	0.844	1.341/0.019	2.856/1.341
037ftest	00011	0 -1 0.000	0.000/0.000	0.032/0.004	0.378	0.133/0.023	1.623/1.932
038ftest	00011	0 -1 1.400	1.449/0.000	1.656/0.024	1.000	1.648/0.018	2.044/0.457
039ftest	00011	0 -1 1.150	1.195/0.000	1.542/0.038	0.956	1.534/0.026	3.233/1.874
040ftest	00011	0 -1 0.650	0.716/0.000	0.778/0.031	0.911	0.841/0.019	1.200/0.780
041ftest	00100	0 -1 0.300	0.329/0.000	0.388/0.006	1.000	0.368/0.008	0.415/0.028
042ftest	00100	0 -1 0.650	0.713/0.000	0.798/0.012	1.000	0.779/0.010	0.887/0.070
043ftest	00100	0 -1 0.450	0.455/0.000	0.543/0.008	1.000	0.520/0.009	0.591/0.042
044ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.038/0.011	0.000/0.000
045ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
046ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.044/0.008	0.525/0.570
047ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.031/0.008	0.371/0.406
048ftest	00100	0 -1 0.150	0.160/0.000	0.199/0.003	1.000	0.195/0.008	0.204/0.015
049ftest	00100	0 -1 0.450	0.455/0.000	0.543/0.008	1.000	0.520/0.009	0.591/0.042
050ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.035/0.009	0.813/0.796
051ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.031/0.008	0.371/0.406
052ftest	00100	0 -1 0.350	0.388/0.000	0.453/0.008	1.000	0.438/0.008	0.496/0.041
053ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.155/0.177
054ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.045/0.009	0.738/0.724
055ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
056ftest	00100	0 -1 0.800	0.798/0.000	0.962/0.011	1.000	0.821/0.010	1.050/0.050
057ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.000/0.000
058ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.027/0.010	0.000/0.000
059ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
060ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.026/0.008	0.443/0.474
061ftest	00101	0 -1 1.200	1.211/0.000	1.410/0.015	1.000	1.306/0.014	1.556/0.050
062ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.057/0.019	0.000/0.000
063ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.084/0.018	0.000/0.000
064ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.040/0.018	0.000/0.000
065ftest	00101	0 -1 1.550	1.622/0.000	1.838/0.030	1.000	1.802/0.018	2.020/0.154
066ftest	00101	0 -1 0.000	0.000/0.000	0.041/0.006	0.311	0.126/0.016	1.983/1.882
067ftest	00101	0 -1 1.450	1.502/0.000	1.707/0.028	1.000	1.639/0.016	1.889/0.145
068ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.006	0.311	0.087/0.014	1.701/1.610
069ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.057/0.016	0.000/0.000
070ftest	00101	0 -1 1.700	1.701/0.000	1.950/0.028	1.000	1.878/0.018	2.160/0.156
071ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.006	0.311	0.087/0.014	1.701/1.610
072ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.060/0.018	0.000/0.000
073ftest	00101	0 -1 1.350	1.393/0.000	1.584/0.026	1.000	1.528/0.015	1.756/0.134
074ftest	00101	0 -1 1.350	1.393/0.000	1.584/0.026	1.000	1.528/0.015	1.756/0.134
075ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.038/0.012	0.000/0.000
076ftest	00101	0 -1 1.350	1.393/0.000	1.584/0.026	1.000	1.528/0.015	1.756/0.134
077ftest	00101	0 -1 1.150	1.201/0.000	1.361/0.021	1.000	1.336/0.014	1.510/0.122
078ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.048/0.017	0.000/0.000
079ftest	00101	0 -1 1.200	1.211/0.000	1.410/0.015	1.000	1.306/0.014	1.556/0.050
080ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
081ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
082ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
083ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
084ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
085ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
086ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
087ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
088ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
089ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
090ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
091ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
092ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
093ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
094ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
095ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
096ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
097ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
098ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
099ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
100ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
101ftest	10010	0 -1 0.000	0.000/0.000	0.386/0.174	0.067	2.005/0.039	0.897/0.799
102ftest	10010	0 -1 0.500	0.683/0.000	1.129/0.313	0.244	4.839/0.057	0.000/0.000
103ftest	10010	0 -1 0.350	0.378/0.000	0.488/0.016	0.911	6.335/0.072	1.183/0.909
104ftest	10010	0 -1 0.650	0.703/0.000	0.862/0.015	1.000	1.431/0.017	1.370/0.529
105ftest	10010	0 -1 0.300	0.334/0.000	0.905/0.442	0.400	2.422/0.034	0.000/0.000
106ftest	10010	0 -1 0.150	0.246/0.000	0.564/0.133	0.311	0.677/0.026	0.000/0.000
107ftest	10010	0 -1 0.750	0.899/0.000	1.027/0.041	0.956	1.868/0.023	1.494/0.713
108ftest	10010	0 -1 0.450	0.440/0.000	0.735/0.068	0.578	0.000/0.000	0.000/0.000
109ftest	10010	0 -1 0.300	0.343/0.000	0.938/0.423	0.578	0.000/0.000	1.740/1.626
110ftest	10010	0 -1 0.250	0.272/0.000	0.503/0.061	0.533	0.738/0.030	0.000/0.000

1260	Scenario	Known		MLR	N-NET	N-NET(id)	PCR	PA	
111ftest	10010	0	-1	0.200	0.248/0.000	0.755/0.258	0.311	0.573/0.017	0.000/0.000
112ftest	10010	0	-1	0.350	0.446/0.000	0.883/0.270	0.533	1.571/0.025	0.000/0.000
113ftest	10010	0	-1	0.800	0.834/0.000	0.999/0.032	0.933	2.335/0.026	1.774/0.765
114ftest	10010	0	-1	0.000	0.089/0.000	0.393/0.189	0.133	1.074/0.029	0.000/0.000
115ftest	10010	0	-1	0.600	0.685/0.000	0.909/0.092	0.644	0.241/0.020	2.023/1.645
116ftest	10010	0	-1	0.150	0.155/0.000	0.199/0.004	1.000	0.956/0.019	0.300/0.152
117ftest	10010	0	-1	0.700	0.800/0.000	0.935/0.027	0.933	2.047/0.031	0.000/0.000
118ftest	10010	0	-1	0.700	0.821/0.000	1.233/0.218	0.556	0.058/0.009	0.000/0.000
119ftest	10010	0	-1	0.000	0.000/0.000	0.035/0.011	0.222	1.611/0.024	0.000/0.000
120ftest	10010	0	-1	0.000	0.028/0.000	0.948/0.427	0.067	2.800/0.032	0.000/0.000
121ftest	10011	0	-1	1.600	1.586/0.000	1.812/0.028	1.000	3.211/0.044	2.611/1.136
122ftest	10011	0	-1	1.250	1.337/0.000	1.875/0.226	0.644	3.522/0.048	2.560/1.072
123ftest	10011	0	-1	0.000	0.000/0.000	0.239/0.059	0.311	0.000/0.000	2.626/2.531
124ftest	10011	0	-1	0.150	0.187/0.000	0.722/0.252	0.244	0.000/0.000	0.000/0.000
125ftest	10011	0	-1	0.000	0.029/0.000	0.080/0.066	0.089	0.000/0.000	1.773/1.814
126ftest	10011	0	-1	1.350	1.403/0.000	1.664/0.047	0.933	3.533/0.046	2.322/0.738
127ftest	10011	0	-1	0.000	0.070/0.000	0.161/0.065	0.067	0.313/0.008	2.243/2.421
128ftest	10011	0	-1	0.450	0.485/0.000	1.760/0.557	0.333	1.570/0.022	0.000/0.000
129ftest	10011	0	-1	1.300	1.296/0.000	2.047/0.190	0.667	6.397/0.082	4.000/2.149
130ftest	10011	0	-1	1.400	1.487/0.000	1.637/0.027	1.000	3.081/0.038	2.067/0.657
131ftest	10011	0	-1	0.400	0.473/0.000	0.816/0.114	0.400	2.419/0.042	2.351/1.707
132ftest	10011	0	-1	0.000	0.030/0.000	0.406/0.121	0.222	1.707/0.038	0.000/0.000
133ftest	10011	0	-1	1.550	1.636/0.000	1.994/0.083	0.822	0.071/0.022	2.878/1.253
134ftest	10011	0	-1	1.300	1.371/0.000	2.025/0.165	0.644	3.681/0.043	3.489/1.496
135ftest	10011	0	-1	1.050	1.081/0.000	1.376/0.029	0.978	1.721/0.035	4.189/2.171
136ftest	10011	0	-1	1.250	1.353/0.000	1.510/0.045	0.911	4.093/0.065	0.000/0.000
137ftest	10011	0	-1	1.200	1.241/0.000	2.360/0.510	0.511	3.569/0.038	4.233/2.236
138ftest	10011	0	-1	0.950	0.978/0.000	1.574/0.171	0.578	2.116/0.022	0.000/0.000
139ftest	10011	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	2.041/2.176
140ftest	10011	0	-1	1.050	1.178/0.000	1.849/0.232	0.533	2.064/0.037	2.967/1.638
141ftest	10100	0	-1	0.000	0.029/0.000	0.197/0.086	0.133	0.000/0.000	1.438/1.463
142ftest	10100	0	-1	0.150	0.205/0.000	0.957/0.507	0.267	0.889/0.015	0.000/0.000
143ftest	10100	0	-1	0.300	0.394/0.000	0.412/0.019	0.933	2.258/0.030	0.000/0.000
144ftest	10100	0	-1	0.000	0.000/0.000	0.161/0.065	0.222	0.241/0.018	0.000/0.000
145ftest	10100	0	-1	0.150	0.178/0.000	0.200/0.004	1.000	0.101/0.009	0.207/0.018
146ftest	10100	0	-1	0.600	0.669/0.000	0.740/0.007	1.000	2.368/0.028	0.000/0.000
147ftest	10100	0	-1	0.000	0.027/0.000	0.358/0.134	0.178	5.685/0.079	0.000/0.000
148ftest	10100	0	-1	0.750	0.850/0.000	1.104/0.116	0.600	1.026/0.013	0.000/0.000
149ftest	10100	0	-1	0.000	0.051/0.000	0.287/0.070	0.311	2.934/0.037	0.000/0.000
150ftest	10100	0	-1	0.400	0.426/0.000	0.650/0.100	0.644	0.000/0.000	0.000/0.000
151ftest	10100	0	-1	0.000	0.028/0.000	0.031/0.027	0.022	3.528/0.037	0.802/0.777
152ftest	10100	0	-1	0.000	0.000/0.000	0.197/0.099	0.067	0.000/0.000	0.000/0.000
153ftest	10100	0	-1	0.800	0.864/0.000	0.951/0.014	1.000	1.297/0.033	0.000/0.000
154ftest	10100	0	-1	0.000	0.031/0.000	0.140/0.069	0.089	0.418/0.011	0.000/0.000
155ftest	10100	0	-1	0.000	0.000/0.000	0.026/0.020	0.156	1.066/0.024	0.000/0.000
156ftest	10100	0	-1	0.000	0.000/0.000	0.000/0.000	0.089	1.965/0.023	0.559/0.546
157ftest	10100	0	-1	0.000	0.049/0.000	0.101/0.074	0.089	0.075/0.008	0.000/0.000
158ftest	10100	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	2.334/0.026	0.000/0.000
159ftest	10100	0	-1	0.000	0.034/0.000	0.438/0.230	0.044	1.617/0.038	0.000/0.000
160ftest	10100	0	-1	0.050	0.083/0.000	0.334/0.180	0.622	0.324/0.021	0.000/0.000
161ftest	10101	0	-1	0.000	0.031/0.000	0.079/0.056	0.111	0.000/0.000	0.000/0.000
162ftest	10101	0	-1	0.000	0.037/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
163ftest	10101	0	-1	1.500	1.604/0.000	1.782/0.021	1.000	3.161/0.036	2.011/0.335
164ftest	10101	0	-1	0.000	0.033/0.000	0.169/0.035	0.400	1.677/0.023	0.000/0.000
165ftest	10101	0	-1	0.000	0.000/0.000	0.161/0.031	0.467	0.000/0.000	2.139/2.039

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
166ftest	10101	0 -1	0.000	0.030/0.000	0.386/0.230	0.156	0.000/0.000
167ftest	10101	0 -1	0.000	0.000/0.000	0.426/0.127	0.267	1.361/0.022
168ftest	10101	0 -1	0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000
169ftest	10101	0 -1	0.000	0.000/0.000	0.126/0.029	0.400	1.271/0.030
170ftest	10101	0 -1	0.000	0.000/0.000	0.125/0.032	0.222	2.905/0.033
171ftest	10101	0 -1	0.000	0.000/0.000	0.063/0.042	0.044	0.470/0.019
172ftest	10101	0 -1	0.000	0.000/0.000	0.036/0.005	0.333	0.083/0.014
173ftest	10101	0 -1	1.300	1.330/0.000	1.521/0.023	1.000	1.411/0.015
174ftest	10101	0 -1	1.600	1.585/0.000	1.859/0.017	1.000	2.900/0.030
175ftest	10101	0 -1	0.000	0.000/0.000	0.043/0.009	0.356	1.911/0.025
176ftest	10101	0 -1	0.000	0.000/0.000	0.248/0.218	0.067	0.000/0.000
177ftest	10101	0 -1	0.000	0.000/0.000	0.362/0.122	0.200	0.000/0.000
178ftest	10101	0 -1	0.000	0.000/0.000	0.027/0.021	0.133	1.793/0.036
179ftest	10101	0 -1	0.000	0.071/0.000	0.257/0.090	0.156	2.006/0.055
180ftest	10101	0 -1	1.650	1.705/0.000	1.872/0.030	1.000	1.842/0.019
181ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
182ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
183ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
184ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
185ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
186ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
187ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
188ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
189ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
190ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
191ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
192ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
193ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
194ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
195ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
196ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
197ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
198ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
199ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
200ftest	11000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000

Appendix G: Batch 6 Report

Batch 6. 40 instances of each of ten scenarios. 399 reported samples. December 29 1997

Sample 243ftest, scenario 10011, caused MLR to stall in the "check" iteration step. The sample contained 1.15 µg/ml of Aroclor 1242, 1.6 µg/ml of Aroclor 1254, and no Aroclor 1260, and contained contamination. NN, NNI, and PA agreed that there were no Aroclors in the sample, while PCR claimed high amounts of 1242 and, strangely, 1260. Since training on subsets of the BLC set was out of the scope of this work, the sample was removed. In over a thousand synthetic samples, a Method failed to deliver an answer only on this sample. The Report first lists opinions for Aroclor 1242, then 1254, and 1260. The Aroclor is indicated in the left corner of the title bar. The first column contains the sample identifier. The second column indicates the sample's scenario, in Contamination, None, Single Multiple, and Overconcentration order. The next two columns are obsolete and not titled. The next column contains a single floating point number, which is the Known concentration of the specific Aroclor in the sample. The last five columns are Method opinions, as shown in the title bar. The quantity opinions are presented as two numbers, separated by a "/". The first is the quantity estimate, and the second is the error estimate, if one was provided by the Method. Neural Net for Identity returns a probability between 0 and 1 that the specific Aroclor is present in the sample.

1242	Scenario			Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0	-1	0.300	0.324/0.000	0.445/0.014	0.956	0.485/0.015	0.822/0.516
002ftest	00010	0	-1	0.750	0.864/0.000	1.059/0.025	0.978	1.017/0.017	2.150/1.540
003ftest	00010	0	-1	0.200	0.196/0.000	0.289/0.006	1.000	0.318/0.011	1.033/1.113
004ftest	00010	0	-1	0.200	0.196/0.000	0.271/0.002	1.000	0.266/0.009	0.287/0.011
005ftest	00010	0	-1	0.800	0.783/0.000	1.012/0.019	1.000	0.933/0.013	1.283/0.389
006ftest	00010	0	-1	0.000	0.000/0.000	0.246/0.107	0.222	0.173/0.016	1.185/1.747
007ftest	00010	0	-1	0.250	0.253/0.000	0.369/0.009	1.000	0.445/0.013	1.377/1.479
008ftest	00010	0	-1	0.550	0.564/0.000	0.790/0.025	0.978	0.853/0.018	1.653/1.251
009ftest	00010	0	-1	0.100	0.099/0.000	0.151/0.006	0.956	0.155/0.009	0.659/0.655
010ftest	00010	0	-1	0.300	0.321/0.000	0.447/0.017	0.956	0.520/0.015	0.980/0.767
011ftest	00010	0	-1	0.700	0.792/0.000	0.970/0.018	1.000	1.010/0.017	1.433/0.616
012ftest	00010	0	-1	0.550	0.565/0.000	0.748/0.010	1.000	0.735/0.011	1.203/0.533
013ftest	00010	0	-1	0.000	0.000/0.000	0.057/0.031	0.222	0.051/0.009	0.000/0.000
014ftest	00010	0	-1	0.650	0.735/0.000	0.918/0.028	1.000	0.925/0.015	1.738/1.214
015ftest	00010	0	-1	0.600	0.600/0.000	0.842/0.023	0.978	0.867/0.016	1.712/1.231
016ftest	00010	0	-1	0.750	0.859/0.000	1.071/0.044	0.933	1.025/0.016	1.200/0.153
017ftest	00010	0	-1	0.400	0.391/0.000	0.569/0.018	0.978	0.577/0.015	0.952/0.544
018ftest	00010	0	-1	0.400	0.393/0.000	0.570/0.024	0.911	0.575/0.013	1.693/1.665
019ftest	00010	0	-1	0.650	0.736/0.000	0.899/0.019	1.000	0.893/0.014	1.653/1.070
020ftest	00010	0	-1	0.000	0.000/0.000	0.174/0.076	0.156	0.076/0.014	0.801/1.134
021ftest	00010	0	-1	0.400	0.394/0.000	0.562/0.017	0.978	0.543/0.011	1.917/1.738
022ftest	00010	0	-1	0.200	0.197/0.000	0.278/0.004	0.978	0.311/0.011	1.903/2.072
023ftest	00010	0	-1	0.350	0.381/0.000	0.527/0.023	0.956	0.572/0.015	1.447/1.346
024ftest	00010	0	-1	0.750	0.862/0.000	1.028/0.015	1.000	1.015/0.014	1.633/0.795
025ftest	00010	0	-1	0.100	0.099/0.000	0.149/0.003	1.000	0.177/0.009	0.809/0.850
026ftest	00010	0	-1	0.350	0.378/0.000	0.504/0.012	0.978	0.531/0.013	0.578/0.057
027ftest	00010	0	-1	0.100	0.100/0.000	0.155/0.004	1.000	0.215/0.011	0.437/0.410
028ftest	00010	0	-1	0.700	0.791/0.000	1.025/0.037	0.956	1.029/0.021	2.117/1.606
029ftest	00010	0	-1	0.800	0.783/0.000	1.056/0.031	0.978	0.993/0.018	2.050/1.482
030ftest	00010	0	-1	0.850	0.849/0.000	1.077/0.020	1.000	0.997/0.015	1.133/0.047
031ftest	00010	0	-1	0.150	0.160/0.000	0.228/0.007	0.978	0.255/0.011	0.283/0.052
032ftest	00010	0	-1	0.000	0.000/0.000	0.119/0.057	0.200	0.116/0.012	0.612/0.892
033ftest	00010	0	-1	0.800	0.779/0.000	1.060/0.035	0.978	1.016/0.019	1.650/0.923
034ftest	00010	0	-1	0.300	0.324/0.000	0.446/0.013	0.956	0.469/0.014	0.822/0.516

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
035ftest	00010	0 -1 0.850	0.850/0.000	1.087/0.020	1.000	0.992/0.017	1.133/0.047
036ftest	00010	0 -1 0.500	0.504/0.000	0.707/0.021	0.978	0.710/0.013	1.613/1.320
037ftest	00010	0 -1 0.150	0.165/0.000	0.218/0.006	0.933	0.337/0.012	1.073/1.239
038ftest	00010	0 -1 0.300	0.320/0.000	0.444/0.016	0.978	0.507/0.014	0.888/0.627
039ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.036/0.009	0.575/0.858
040ftest	00010	0 -1 0.550	0.565/0.000	0.757/0.013	1.000	0.761/0.013	1.117/0.473
041ftest	00011	0 -1 0.950	0.971/0.000	1.249/0.027	1.000	1.196/0.024	1.400/0.115
042ftest	00011	0 -1 0.000	0.000/0.000	0.034/0.022	0.133	0.088/0.015	1.667/2.454
043ftest	00011	0 -1 0.500	0.506/0.000	0.749/0.027	0.956	0.807/0.026	1.435/0.948
044ftest	00011	0 -1 0.950	0.977/0.000	1.402/0.078	0.889	1.285/0.035	3.683/3.455
045ftest	00011	0 -1 1.200	1.219/0.000	1.616/0.046	0.978	1.540/0.028	3.050/2.056
046ftest	00011	0 -1 1.550	1.646/0.000	2.083/0.047	1.000	2.018/0.033	3.500/1.948
047ftest	00011	0 -1 0.400	0.395/0.000	0.559/0.008	1.000	0.545/0.015	2.976/3.050
048ftest	00011	0 -1 0.550	0.568/0.000	0.756/0.006	1.000	0.764/0.017	3.327/3.205
049ftest	00011	0 -1 1.250	1.286/0.000	1.621/0.030	1.000	1.508/0.020	2.617/1.409
050ftest	00011	0 -1 0.000	0.000/0.000	0.393/0.175	0.200	0.146/0.019	1.882/2.701
051ftest	00011	0 -1 1.400	1.445/0.000	2.276/0.107	0.956	1.829/0.032	3.533/2.111
052ftest	00011	0 -1 1.000	1.010/0.000	1.420/0.042	1.000	1.240/0.023	1.483/0.090
053ftest	00011	0 -1 0.950	0.978/0.000	1.322/0.056	0.956	1.236/0.026	3.433/3.107
054ftest	00011	0 -1 1.200	1.217/0.000	1.647/0.060	0.956	1.611/0.033	3.717/2.997
055ftest	00011	0 -1 0.900	0.906/0.000	1.299/0.048	0.956	1.145/0.020	1.450/0.320
056ftest	00011	0 -1 1.600	1.569/0.000	2.103/0.063	0.978	1.871/0.030	5.629/4.520
057ftest	00011	0 -1 0.000	0.000/0.000	0.322/0.168	0.200	0.125/0.020	1.790/2.591
058ftest	00011	0 -1 1.350	1.411/0.000	2.204/0.105	0.956	1.724/0.030	3.967/2.846
059ftest	00011	0 -1 0.000	0.000/0.000	0.357/0.154	0.133	0.165/0.024	1.621/2.257
060ftest	00011	0 -1 1.600	1.565/0.000	2.161/0.079	0.978	1.957/0.036	3.533/2.020
061ftest	00011	0 -1 0.650	0.736/0.000	0.977/0.020	1.000	0.998/0.034	3.213/3.197
062ftest	00011	0 -1 1.600	1.564/0.000	2.550/0.127	0.956	1.934/0.033	4.417/3.105
063ftest	00011	0 -1 1.450	1.517/0.000	2.002/0.069	0.978	1.926/0.036	4.217/3.222
064ftest	00011	0 -1 0.950	0.974/0.000	1.245/0.026	1.000	1.165/0.022	1.350/0.076
065ftest	00011	0 -1 1.050	1.083/0.000	1.401/0.041	0.978	1.333/0.023	2.967/2.285
066ftest	00011	0 -1 1.700	1.685/0.000	2.177/0.055	1.000	2.034/0.028	2.300/0.082
067ftest	00011	0 -1 1.200	1.217/0.000	1.659/0.056	0.956	1.585/0.033	3.100/2.131
068ftest	00011	0 -1 1.450	1.520/0.000	1.917/0.038	1.000	1.753/0.024	3.971/2.527
069ftest	00011	0 -1 1.150	1.203/0.000	1.535/0.043	1.000	1.456/0.024	1.650/0.076
070ftest	00011	0 -1 1.050	1.081/0.000	1.399/0.036	0.978	1.373/0.027	2.167/1.062
071ftest	00011	0 -1 1.650	1.636/0.000	2.453/0.096	1.000	1.990/0.037	3.617/1.895
072ftest	00011	0 -1 0.000	0.000/0.000	0.298/0.138	0.178	0.119/0.018	1.522/2.207
073ftest	00011	0 -1 1.600	1.568/0.000	2.175/0.081	0.956	1.948/0.038	4.300/3.173
074ftest	00011	0 -1 0.300	0.326/0.000	0.930/0.256	0.622	0.548/0.024	2.480/2.929
075ftest	00011	0 -1 1.450	1.518/0.000	1.927/0.040	1.000	1.832/0.031	2.650/0.938
076ftest	00011	0 -1 1.550	1.643/0.000	2.763/0.168	0.867	2.089/0.038	4.717/3.420
077ftest	00011	0 -1 0.000	0.000/0.000	0.381/0.168	0.156	0.171/0.024	1.779/2.509
078ftest	00011	0 -1 1.350	1.409/0.000	1.811/0.058	1.000	1.671/0.026	1.900/0.082
079ftest	00011	0 -1 0.450	0.453/0.000	0.630/0.009	1.000	0.645/0.019	4.014/4.266
080ftest	00011	0 -1 0.900	0.908/0.000	1.156/0.013	1.000	1.125/0.021	3.843/3.350
081ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.963/1.242
082ftest	00100	0 -1 0.000	0.000/0.000	0.028/0.011	0.244	0.049/0.010	0.000/0.000
083ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
084ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.054/0.009	0.552/0.825
085ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.000/0.000	0.000/0.000
086ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.733	0.000/0.000	0.000/0.000
087ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.000/0.000	0.000/0.000
088ftest	00100	0 -1 0.600	0.599/0.000	0.798/0.009	1.000	0.751/0.011	0.845/0.031
089ftest	00100	0 -1 0.650	0.733/0.000	0.869/0.010	1.000	0.817/0.011	0.922/0.035

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
090ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.072/0.012	0.000/0.000
091ftest	00100	0 -1 0.300	0.322/0.000	0.410/0.003	1.000	0.403/0.009	0.430/0.023
092ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
093ftest	00100	0 -1 0.700	0.790/0.000	0.940/0.010	1.000	0.910/0.012	0.982/0.029
094ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.025/0.009	0.000/0.000
095ftest	00100	0 -1 0.800	0.785/0.000	1.028/0.021	1.000	0.881/0.012	1.029/0.045
096ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.054/0.011	0.000/0.000
097ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
098ftest	00100	0 -1 0.750	0.859/0.000	1.019/0.014	1.000	0.959/0.013	1.056/0.051
099ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.028/0.009	0.805/1.051
100ftest	00100	0 -1 0.850	0.849/0.000	1.055/0.016	1.000	0.961/0.013	1.100/0.000
101ftest	00100	0 -1 0.750	0.859/0.000	1.019/0.014	1.000	0.959/0.013	1.056/0.051
102ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.054/0.009	0.552/0.825
103ftest	00100	0 -1 0.550	0.564/0.000	0.741/0.009	1.000	0.700/0.011	0.777/0.035
104ftest	00100	0 -1 0.250	0.252/0.000	0.337/0.002	1.000	0.328/0.009	0.357/0.019
105ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.031/0.009	0.000/0.000
106ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.000/0.000	0.000/0.000
107ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.031/0.009	0.000/0.000
108ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.035/0.009	1.216/1.572
109ftest	00100	0 -1 0.600	0.599/0.000	0.798/0.009	1.000	0.751/0.011	0.845/0.031
110ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.054/0.011	0.000/0.000
111ftest	00100	0 -1 0.400	0.393/0.000	0.540/0.007	1.000	0.477/0.009	0.564/0.005
112ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.031/0.010	0.000/0.000
113ftest	00100	0 -1 0.000	0.000/0.000	0.031/0.027	0.156	0.032/0.009	0.000/0.000
114ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.036/0.011	0.000/0.000
115ftest	00100	0 -1 0.150	0.162/0.000	0.211/0.001	1.000	0.211/0.009	0.222/0.007
116ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
117ftest	00100	0 -1 0.900	0.906/0.000	1.130/0.018	1.000	1.053/0.013	1.200/0.000
118ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
119ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
120ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.028/0.009	0.805/1.051
121ftest	00101	0 -1 1.200	1.217/0.000	1.521/0.024	1.000	1.399/0.016	1.600/0.000
122ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.533	0.043/0.014	0.000/0.000
123ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.116/0.020	0.000/0.000
124ftest	00101	0 -1 0.950	0.975/0.000	1.201/0.019	1.000	1.101/0.014	1.243/0.049
125ftest	00101	0 -1 1.150	1.207/0.000	1.473/0.022	1.000	1.361/0.016	1.529/0.070
126ftest	00101	0 -1 1.550	1.644/0.000	2.022/0.042	1.000	1.851/0.021	2.140/0.049
127ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.068/0.014	0.000/0.000
128ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.088/0.019	0.000/0.000
129ftest	00101	0 -1 1.250	1.286/0.000	1.589/0.025	1.000	1.450/0.017	1.700/0.000
130ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.019	0.222	0.063/0.014	2.559/3.247
131ftest	00101	0 -1 1.050	1.081/0.000	1.330/0.020	1.000	1.219/0.015	1.400/0.001
132ftest	00101	0 -1 0.950	0.975/0.000	1.201/0.019	1.000	1.101/0.014	1.243/0.049
133ftest	00101	0 -1 0.000	0.000/0.000	0.034/0.021	0.244	0.045/0.014	2.713/3.438
134ftest	00101	0 -1 0.000	0.000/0.000	0.076/0.010	0.578	0.085/0.017	3.313/4.184
135ftest	00101	0 -1 1.450	1.518/0.000	1.947/0.071	1.000	1.709/0.019	1.943/0.073
136ftest	00101	0 -1 1.550	1.644/0.000	2.022/0.042	1.000	1.851/0.021	2.140/0.049
137ftest	00101	0 -1 1.450	1.518/0.000	1.947/0.071	1.000	1.709/0.019	1.943/0.073
138ftest	00101	0 -1 1.650	1.634/0.000	2.054/0.037	1.000	1.850/0.021	2.160/0.049
139ftest	00101	0 -1 1.400	1.446/0.000	1.790/0.027	1.000	1.662/0.019	1.900/0.001
140ftest	00101	0 -1 0.000	0.000/0.000	0.032/0.018	0.244	0.041/0.013	2.263/2.876
141ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.019	0.244	0.059/0.013	2.412/3.051
142ftest	00101	0 -1 0.000	0.000/0.000	0.085/0.010	0.622	0.088/0.016	3.062/3.825
143ftest	00101	0 -1 0.000	0.000/0.000	0.062/0.030	0.222	0.072/0.018	3.625/4.544
144ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.040/0.013	0.000/0.000

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
145ftest	00101	0 -1 0.000	0.000/0.000	0.062/0.030	0.222	0.072/0.018	3.625/4.544
146ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.064/0.017	0.000/0.000
147ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.088/0.019	0.000/0.000
148ftest	00101	0 -1 0.000	0.000/0.000	0.041/0.029	0.200	0.046/0.018	3.557/4.521
149ftest	00101	0 -1 0.000	0.000/0.000	0.032/0.018	0.244	0.041/0.013	2.263/2.876
150ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.533	0.043/0.014	0.000/0.000
151ftest	00101	0 -1 1.100	1.136/0.000	1.402/0.021	1.000	1.323/0.016	1.500/0.000
152ftest	00101	0 -1 0.000	0.000/0.000	0.034/0.021	0.244	0.045/0.014	2.713/3.438
153ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.311	0.074/0.015	0.000/0.000
154ftest	00101	0 -1 1.350	1.412/0.000	1.731/0.026	1.000	1.591/0.018	1.840/0.049
155ftest	00101	0 -1 0.000	0.000/0.000	0.079/0.009	0.622	0.078/0.019	3.826/4.858
156ftest	00101	0 -1 0.000	0.000/0.000	0.076/0.010	0.578	0.085/0.017	3.313/4.184
157ftest	00101	0 -1 0.000	0.000/0.000	0.036/0.017	0.244	0.062/0.012	2.171/2.750
158ftest	00101	0 -1 0.000	0.000/0.000	0.076/0.010	0.578	0.085/0.017	3.313/4.184
159ftest	00101	0 -1 1.200	1.217/0.000	1.521/0.024	1.000	1.399/0.016	1.600/0.000
160ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.311	0.068/0.018	0.000/0.000
161ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
162ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
163ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
164ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
165ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
166ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
167ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
168ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
169ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
170ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
171ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
172ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
173ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
174ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
175ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
176ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
177ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
178ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
179ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
180ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
181ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
182ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
183ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
184ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
185ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
186ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
187ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
188ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
189ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
190ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
191ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
192ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
193ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
194ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
195ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
196ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
197ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
198ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
199ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
200ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
201ftest	10010	0 -1 0.000	0.076/0.000	1.186/0.812	0.067	0.000/0.000	0.000/0.000
202ftest	10010	0 -1 0.000	0.091/0.000	0.308/0.140	0.178	2.082/0.052	0.000/0.000
203ftest	10010	0 -1 0.000	0.037/0.000	0.817/0.387	0.089	0.821/0.022	1.178/1.612
204ftest	10010	0 -1 0.000	0.033/0.000	0.217/0.088	0.267	0.000/0.000	0.000/0.000
205ftest	10010	0 -1 0.650	0.852/0.000	2.557/0.311	0.622	1.212/0.054	0.000/0.000
206ftest	10010	0 -1 0.500	0.507/0.000	0.673/0.009	1.000	0.795/0.011	0.718/0.025
207ftest	10010	0 -1 0.300	0.352/0.000	0.433/0.007	1.000	1.175/0.024	2.026/0.847
208ftest	10010	0 -1 0.550	0.563/0.000	0.774/0.023	0.978	0.000/0.000	2.873/2.687
209ftest	10010	0 -1 0.350	0.388/0.000	0.489/0.008	1.000	0.580/0.011	0.573/0.099
210ftest	10010	0 -1 0.150	0.164/0.000	0.220/0.004	0.978	0.223/0.011	1.977/2.229
211ftest	10010	0 -1 0.550	0.715/0.000	1.086/0.144	0.578	2.160/0.024	0.000/0.000
212ftest	10010	0 -1 0.850	0.900/0.000	3.938/1.766	0.356	2.532/0.037	0.000/0.000
213ftest	10010	0 -1 0.250	0.289/0.000	1.326/0.410	0.378	1.279/0.017	0.000/0.000
214ftest	10010	0 -1 0.050	0.077/0.000	2.430/1.367	0.200	3.081/0.043	1.205/1.689
215ftest	10010	0 -1 0.750	0.886/0.000	1.029/0.021	1.000	1.114/0.030	2.067/0.998
216ftest	10010	0 -1 0.250	0.357/0.000	1.133/0.342	0.444	1.736/0.031	0.000/0.000
217ftest	10010	0 -1 0.600	0.685/0.000	0.868/0.028	0.933	2.361/0.042	2.010/1.420
218ftest	10010	0 -1 0.550	0.564/0.000	0.780/0.022	1.000	0.848/0.016	0.842/0.053
219ftest	10010	0 -1 0.600	0.718/0.000	2.639/0.803	0.422	2.247/0.036	0.957/0.205
220ftest	10010	0 -1 0.850	0.908/0.000	2.061/0.556	0.533	0.494/0.012	2.514/1.056
221ftest	10010	0 -1 0.150	0.169/0.000	0.243/0.007	0.978	0.000/0.000	0.523/0.374
222ftest	10010	0 -1 0.650	0.738/0.000	0.929/0.029	0.956	0.551/0.029	2.023/1.587
223ftest	10010	0 -1 0.300	0.368/0.000	1.704/0.431	0.356	0.000/0.000	0.000/0.000
224ftest	10010	0 -1 0.300	0.340/0.000	0.435/0.015	0.956	0.848/0.013	1.977/1.964
225ftest	10010	0 -1 0.550	0.681/0.000	2.636/0.760	0.289	0.991/0.069	0.000/0.000
226ftest	10010	0 -1 0.550	0.704/0.000	1.298/0.408	0.622	0.854/0.035	2.123/1.476
227ftest	10010	0 -1 0.350	0.388/0.000	0.511/0.012	0.978	0.767/0.029	3.287/3.488
228ftest	10010	0 -1 0.050	0.118/0.000	1.524/0.810	0.244	0.510/0.014	0.000/0.000
229ftest	10010	0 -1 0.650	0.789/0.000	1.092/0.254	0.644	2.857/0.043	0.000/0.000
230ftest	10010	0 -1 0.650	0.869/0.000	1.413/0.179	0.711	2.777/0.039	2.657/1.693
231ftest	10010	0 -1 0.500	0.501/0.000	1.382/0.452	0.578	2.317/0.047	1.928/1.721
232ftest	10010	0 -1 0.650	0.850/0.000	1.279/0.284	0.511	2.047/0.071	3.267/2.293
233ftest	10010	0 -1 0.800	0.832/0.000	3.019/1.209	0.489	0.337/0.064	1.917/0.839
234ftest	10010	0 -1 0.500	0.570/0.000	0.677/0.009	1.000	2.099/0.050	2.996/2.880
235ftest	10010	0 -1 0.600	0.691/0.000	0.854/0.028	0.956	1.040/0.026	3.154/2.961
236ftest	10010	0 -1 0.800	0.874/0.000	1.004/0.023	0.978	1.780/0.032	1.786/0.549
237ftest	10010	0 -1 0.500	0.512/0.000	0.711/0.024	0.956	0.000/0.000	1.643/1.348
238ftest	10010	0 -1 0.750	0.896/0.000	1.030/0.015	1.000	1.518/0.019	1.650/0.624
239ftest	10010	0 -1 0.100	0.158/0.000	1.714/1.123	0.578	0.790/0.038	0.427/0.372
240ftest	10010	0 -1 0.150	0.176/0.000	0.218/0.004	1.000	0.340/0.009	0.388/0.246
241ftest	10011	0 -1 1.250	1.474/0.000	2.528/0.335	0.556	0.799/0.066	2.550/0.830
242ftest	10011	0 -1 1.050	1.116/0.000	1.363/0.031	1.000	3.521/0.049	1.717/0.498
244ftest	10011	0 -1 0.150	0.206/0.000	2.124/0.647	0.200	1.498/0.048	0.000/0.000
245ftest	10011	0 -1 0.650	0.737/0.000	0.962/0.024	1.000	0.495/0.022	3.110/3.166
246ftest	10011	0 -1 0.000	0.028/0.000	0.417/0.188	0.200	0.548/0.031	1.606/2.362
247ftest	10011	0 -1 1.450	1.569/0.000	2.108/0.113	0.844	1.114/0.022	5.429/4.232
248ftest	10011	0 -1 1.400	1.419/0.000	1.895/0.056	1.000	1.279/0.046	3.300/2.039
249ftest	10011	0 -1 1.250	1.295/0.000	2.102/0.109	0.956	0.000/0.000	3.483/2.184
250ftest	10011	0 -1 1.150	1.224/0.000	1.548/0.034	1.000	1.103/0.037	1.667/0.094
251ftest	10011	0 -1 1.550	1.777/0.000	3.095/0.652	0.667	2.590/0.051	4.733/2.967
252ftest	10011	0 -1 0.900	1.004/0.000	2.176/0.386	0.489	2.824/0.050	3.750/2.938
253ftest	10011	0 -1 1.300	1.391/0.000	2.636/0.358	0.533	2.639/0.072	3.033/1.530
254ftest	10011	0 -1 0.900	0.927/0.000	1.162/0.021	1.000	1.333/0.030	2.783/2.367
255ftest	10011	0 -1 1.200	1.214/0.000	1.658/0.063	0.956	1.103/0.026	3.900/3.354

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
256ftest	10011	0 -1 0.950	1.008/0.000	1.286/0.046	0.956	1.155/0.038	2.500/1.797
257ftest	10011	0 -1 0.700	0.890/0.000	2.757/0.779	0.311	2.118/0.051	2.817/2.754
258ftest	10011	0 -1 0.000	0.000/0.000	2.155/0.807	0.178	0.967/0.024	0.000/0.000
259ftest	10011	0 -1 1.500	1.711/0.000	2.043/0.066	0.978	4.036/0.042	0.000/0.000
260ftest	10011	0 -1 0.000	0.042/0.000	0.653/0.207	0.178	0.000/0.000	2.240/3.271
261ftest	10011	0 -1 1.550	1.640/0.000	2.074/0.063	1.000	1.915/0.025	2.167/0.075
262ftest	10011	0 -1 1.600	1.596/0.000	2.203/0.082	0.956	2.075/0.044	3.467/1.910
263ftest	10011	0 -1 1.600	1.684/0.000	3.290/0.436	0.533	0.000/0.000	3.017/0.631
264ftest	10011	0 -1 1.500	1.567/0.000	2.116/0.092	0.933	2.030/0.065	3.350/1.826
265ftest	10011	0 -1 0.900	0.981/0.000	1.212/0.041	0.956	2.791/0.057	2.500/1.844
266ftest	10011	0 -1 0.000	0.083/0.000	2.954/1.689	0.089	0.000/0.000	1.002/0.953
267ftest	10011	0 -1 0.000	0.000/0.000	0.502/0.177	0.244	0.000/0.000	2.147/2.845
268ftest	10011	0 -1 1.500	1.708/0.000	2.436/0.082	0.911	2.736/0.038	5.286/3.065
269ftest	10011	0 -1 1.600	1.601/0.000	4.154/0.441	0.689	2.288/0.056	5.083/4.554
270ftest	10011	0 -1 1.350	1.487/0.000	2.054/0.062	0.978	2.389/0.047	3.933/2.126
271ftest	10011	0 -1 1.050	1.073/0.000	1.390/0.034	0.978	1.643/0.036	2.300/1.283
272ftest	10011	0 -1 0.000	0.028/0.000	0.412/0.232	0.178	0.000/0.000	3.931/4.283
273ftest	10011	0 -1 1.650	1.696/0.000	3.022/0.532	0.600	0.000/0.000	6.000/4.473
274ftest	10011	0 -1 0.000	0.033/0.000	0.820/0.505	0.156	1.332/0.029	0.000/0.000
275ftest	10011	0 -1 0.450	0.517/0.000	2.379/0.266	0.733	0.000/0.000	0.000/0.000
276ftest	10011	0 -1 0.500	0.535/0.000	0.739/0.029	0.956	1.435/0.025	1.780/1.523
277ftest	10011	0 -1 0.950	1.069/0.000	1.692/0.095	0.778	0.000/0.000	3.750/3.416
278ftest	10011	0 -1 0.000	0.000/0.000	0.654/0.245	0.156	0.068/0.020	2.351/3.117
279ftest	10011	0 -1 1.700	1.769/0.000	3.557/0.711	0.489	0.874/0.029	3.583/1.622
280ftest	10011	0 -1 0.200	0.329/0.000	0.923/0.123	0.667	1.842/0.055	2.295/2.338
281ftest	10100	0 -1 0.000	0.041/0.000	0.556/0.311	0.200	0.032/0.057	0.000/0.000
282ftest	10100	0 -1 0.100	0.157/0.000	0.690/0.392	0.356	0.280/0.015	0.000/0.000
283ftest	10100	0 -1 0.500	0.525/0.000	0.669/0.008	1.000	1.046/0.018	0.714/0.019
284ftest	10100	0 -1 0.000	0.064/0.000	0.030/0.009	0.267	1.104/0.020	0.000/0.000
285ftest	10100	0 -1 0.800	0.901/0.000	1.990/0.750	0.644	0.000/0.000	0.000/0.000
286ftest	10100	0 -1 0.100	0.083/0.000	0.144/0.001	1.000	0.000/0.000	0.142/0.007
287ftest	10100	0 -1 0.000	0.000/0.000	0.394/0.236	0.178	1.115/0.051	0.000/0.000
288ftest	10100	0 -1 0.000	0.067/0.000	0.542/0.475	0.178	0.879/0.012	1.143/1.681
289ftest	10100	0 -1 0.000	0.000/0.000	1.407/0.851	0.200	1.750/0.044	0.000/0.000
290ftest	10100	0 -1 0.000	0.030/0.000	0.053/0.038	0.089	0.000/0.000	1.476/1.889
291ftest	10100	0 -1 0.000	0.051/0.000	0.401/0.214	0.111	0.315/0.055	0.000/0.000
292ftest	10100	0 -1 0.000	0.031/0.000	1.107/0.770	0.178	0.834/0.022	0.000/0.000
293ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.052/0.010	1.216/1.572
294ftest	10100	0 -1 0.000	0.049/0.000	0.116/0.088	0.200	0.000/0.000	0.000/0.000
295ftest	10100	0 -1 0.200	0.248/0.000	1.261/0.446	0.356	1.343/0.038	0.000/0.000
296ftest	10100	0 -1 0.650	0.784/0.000	0.906/0.041	0.911	1.230/0.031	1.131/0.367
297ftest	10100	0 -1 0.800	0.842/0.000	1.032/0.021	1.000	3.147/0.037	0.000/0.000
298ftest	10100	0 -1 0.000	0.043/0.000	1.777/0.597	0.178	1.909/0.028	0.000/0.000
299ftest	10100	0 -1 0.000	0.084/0.000	0.500/0.253	0.244	0.000/0.000	0.000/0.000
300ftest	10100	0 -1 0.000	0.038/0.000	0.318/0.166	0.178	0.047/0.030	0.000/0.000
301ftest	10100	0 -1 0.000	0.000/0.000	0.031/0.014	0.200	0.496/0.011	1.904/2.439
302ftest	10100	0 -1 0.000	0.041/0.000	0.635/0.435	0.156	0.000/0.000	0.000/0.000
303ftest	10100	0 -1 0.550	0.543/0.000	0.740/0.009	1.000	0.934/0.014	0.777/0.035
304ftest	10100	0 -1 0.200	0.238/0.000	1.358/0.571	0.489	0.949/0.023	0.273/0.021
305ftest	10100	0 -1 0.000	0.000/0.000	0.437/0.252	0.067	1.462/0.020	0.158/0.245
306ftest	10100	0 -1 0.000	0.000/0.000	0.319/0.155	0.178	1.628/0.039	0.000/0.000
307ftest	10100	0 -1 0.000	0.000/0.000	0.050/0.018	0.200	0.000/0.000	0.000/0.000
308ftest	10100	0 -1 0.000	0.053/0.000	0.424/0.224	0.111	0.000/0.000	1.262/1.688
309ftest	10100	0 -1 0.750	0.863/0.000	1.047/0.025	1.000	1.096/0.014	1.050/0.151
310ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.548/0.827

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
311ftest	10100	0 -1 0.000	0.026/0.000	0.301/0.169	0.133	0.000/0.000	1.310/1.725
312ftest	10100	0 -1 0.000	0.000/0.000	0.343/0.162	0.222	1.119/0.047	0.000/0.000
313ftest	10100	0 -1 0.000	0.104/0.000	1.083/0.583	0.133	1.361/0.018	0.000/0.000
314ftest	10100	0 -1 0.000	0.000/0.000	0.478/0.261	0.133	0.892/0.014	0.000/0.000
315ftest	10100	0 -1 0.650	0.792/0.000	3.041/1.078	0.311	3.414/0.060	0.980/0.309
316ftest	10100	0 -1 0.000	0.031/0.000	0.129/0.107	0.156	0.000/0.000	0.000/0.000
317ftest	10100	0 -1 0.800	0.802/0.000	1.043/0.021	1.000	1.519/0.030	1.071/0.070
318ftest	10100	0 -1 0.550	0.589/0.000	0.803/0.042	0.911	0.000/0.000	0.777/0.035
319ftest	10100	0 -1 0.800	0.786/0.000	1.027/0.021	1.000	0.999/0.013	1.029/0.045
320ftest	10100	0 -1 0.000	0.110/0.000	1.126/0.661	0.156	1.132/0.028	0.000/0.000
321ftest	10101	0 -1 0.000	0.100/0.000	1.498/0.380	0.244	0.000/0.000	0.000/0.000
322ftest	10101	0 -1 0.000	0.036/0.000	0.253/0.119	0.222	0.000/0.000	0.000/0.000
323ftest	10101	0 -1 1.100	1.209/0.000	3.196/1.056	0.578	2.878/0.031	0.000/0.000
324ftest	10101	0 -1 0.000	0.065/0.000	1.648/0.560	0.156	0.000/0.000	0.000/0.000
325ftest	10101	0 -1 0.000	0.061/0.000	2.373/0.771	0.267	0.339/0.010	0.000/0.000
326ftest	10101	0 -1 0.000	0.000/0.000	0.329/0.164	0.156	0.000/0.000	2.697/3.422
327ftest	10101	0 -1 0.000	0.037/0.000	0.465/0.196	0.133	0.000/0.000	0.000/0.000
328ftest	10101	0 -1 0.000	0.035/0.000	0.421/0.214	0.200	0.000/0.000	0.000/0.000
329ftest	10101	0 -1 0.000	0.059/0.000	0.152/0.118	0.178	0.402/0.014	0.000/0.000
330ftest	10101	0 -1 0.950	0.993/0.000	1.245/0.039	0.933	1.356/0.016	1.243/0.049
331ftest	10101	0 -1 0.000	0.069/0.000	0.884/0.605	0.067	0.397/0.023	2.810/3.380
332ftest	10101	0 -1 1.250	1.350/0.000	2.780/0.661	0.489	0.280/0.032	1.683/0.069
333ftest	10101	0 -1 0.000	0.059/0.000	0.165/0.092	0.178	1.017/0.049	2.291/2.929
334ftest	10101	0 -1 0.950	1.168/0.000	1.694/0.270	0.667	2.345/0.094	1.250/0.126
335ftest	10101	0 -1 1.000	1.080/0.000	1.270/0.018	1.000	0.970/0.020	1.267/0.047
336ftest	10101	0 -1 0.000	0.049/0.000	0.715/0.531	0.178	1.276/0.080	0.000/0.000
337ftest	10101	0 -1 1.000	1.039/0.000	2.126/0.560	0.644	3.897/0.056	1.367/0.205
338ftest	10101	0 -1 0.000	0.040/0.000	0.034/0.011	0.244	0.000/0.000	0.000/0.000
339ftest	10101	0 -1 0.000	0.000/0.000	0.504/0.458	0.133	0.730/0.030	2.697/3.422
340ftest	10101	0 -1 1.300	1.375/0.000	1.736/0.046	1.000	1.453/0.020	1.750/0.050
341ftest	10101	0 -1 1.600	1.673/0.000	2.291/0.115	0.933	2.384/0.040	2.133/0.275
342ftest	10101	0 -1 1.350	1.432/0.000	1.875/0.080	0.933	0.508/0.026	1.840/0.049
343ftest	10101	0 -1 0.000	0.000/0.000	0.068/0.024	0.200	0.607/0.034	0.000/0.000
344ftest	10101	0 -1 0.000	0.000/0.000	0.298/0.250	0.178	1.564/0.032	0.000/0.000
345ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.401/0.019	0.000/0.000
346ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.068/0.021	0.000/0.000
347ftest	10101	0 -1 1.200	1.255/0.000	1.513/0.032	1.000	0.523/0.017	1.533/0.111
348ftest	10101	0 -1 0.000	0.034/0.000	1.886/0.715	0.111	0.000/0.000	0.000/0.000
349ftest	10101	0 -1 0.000	0.076/0.000	1.031/0.505	0.133	0.000/0.000	0.000/0.000
350ftest	10101	0 -1 1.650	1.705/0.000	2.094/0.037	0.978	3.564/0.044	2.167/0.205
351ftest	10101	0 -1 0.000	0.036/0.000	0.331/0.254	0.244	1.295/0.034	0.000/0.000
352ftest	10101	0 -1 0.000	0.025/0.000	0.251/0.220	0.156	0.000/0.000	0.000/0.000
353ftest	10101	0 -1 0.000	0.000/0.000	0.496/0.320	0.111	1.968/0.054	0.000/0.000
354ftest	10101	0 -1 0.000	0.042/0.000	1.113/0.491	0.133	0.596/0.035	0.000/0.000
355ftest	10101	0 -1 0.000	0.000/0.000	0.236/0.172	0.244	0.000/0.000	0.000/0.000
356ftest	10101	0 -1 0.000	0.000/0.000	0.840/0.461	0.067	0.871/0.028	3.690/4.421
357ftest	10101	0 -1 0.000	0.027/0.000	0.210/0.113	0.178	1.310/0.047	0.000/0.000
358ftest	10101	0 -1 0.000	0.071/0.000	0.861/0.485	0.156	0.886/0.031	0.000/0.000
359ftest	10101	0 -1 1.400	1.459/0.000	1.835/0.027	1.000	3.712/0.057	1.900/0.100
360ftest	10101	0 -1 1.000	1.109/0.000	1.464/0.069	0.911	0.000/0.000	1.400/0.271
361ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
362ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
363ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
364ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
365ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

[illegible]

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA
001ftest	00010	0 -1 0.200	0.199/0.000	0.194/0.018	0.689	0.000/0.000	1.179/0.598
002ftest	00010	0 -1 0.800	0.787/0.000	1.060/0.061	0.867	0.644/0.019	1.644/0.417
003ftest	00010	0 -1 0.500	0.517/0.000	0.734/0.059	0.756	0.404/0.012	1.056/0.180
004ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
005ftest	00010	0 -1 0.150	0.165/0.000	0.192/0.011	0.867	0.060/0.014	0.759/0.390
006ftest	00010	0 -1 0.750	0.883/0.000	0.763/0.066	0.689	0.477/0.017	1.489/0.456
007ftest	00010	0 -1 0.650	0.741/0.000	0.668/0.037	0.844	0.445/0.015	1.570/0.420
008ftest	00010	0 -1 0.550	0.589/0.000	0.594/0.043	0.711	0.253/0.020	1.943/0.389
009ftest	00010	0 -1 0.200	0.199/0.000	0.255/0.003	1.000	0.179/0.010	0.356/0.075
010ftest	00010	0 -1 0.300	0.343/0.000	0.322/0.017	0.756	0.079/0.016	1.330/0.596
011ftest	00010	0 -1 0.250	0.251/0.000	0.282/0.018	0.733	0.000/0.000	1.246/0.432
012ftest	00010	0 -1 0.150	0.161/0.000	0.204/0.004	1.000	0.095/0.012	0.577/0.351
013ftest	00010	0 -1 0.250	0.255/0.000	0.298/0.016	0.822	0.161/0.010	0.448/0.084
014ftest	00010	0 -1 0.550	0.573/0.000	0.632/0.027	0.844	0.354/0.017	1.432/0.354
015ftest	00010	0 -1 0.550	0.579/0.000	0.564/0.043	0.689	0.326/0.018	1.566/0.370
016ftest	00010	0 -1 0.050	0.054/0.000	0.040/0.004	0.756	0.000/0.000	0.000/0.000
017ftest	00010	0 -1 0.200	0.211/0.000	0.209/0.013	0.689	0.000/0.000	0.000/0.000
018ftest	00010	0 -1 0.750	0.862/0.000	1.055/0.045	0.889	0.656/0.014	1.400/0.231
019ftest	00010	0 -1 0.500	0.509/0.000	0.538/0.033	0.800	0.374/0.015	1.240/0.374
020ftest	00010	0 -1 0.500	0.518/0.000	0.503/0.040	0.733	0.398/0.015	1.088/0.378
021ftest	00010	0 -1 0.550	0.573/0.000	0.681/0.005	1.000	0.507/0.012	1.032/0.258
022ftest	00010	0 -1 0.650	0.735/0.000	0.847/0.011	1.000	0.617/0.012	1.097/0.236
023ftest	00010	0 -1 0.600	0.682/0.000	0.602/0.047	0.689	0.364/0.017	1.554/0.393
024ftest	00010	0 -1 0.350	0.391/0.000	0.464/0.006	1.000	0.267/0.015	1.000/0.473
025ftest	00010	0 -1 0.250	0.252/0.000	0.322/0.004	1.000	0.206/0.010	0.438/0.077
026ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.000/0.000
027ftest	00010	0 -1 0.150	0.161/0.000	0.162/0.010	0.689	0.000/0.000	0.000/0.000
028ftest	00010	0 -1 0.800	0.799/0.000	0.747/0.055	0.689	0.471/0.023	2.078/0.541
029ftest	00010	0 -1 0.650	0.747/0.000	0.716/0.047	0.822	0.438/0.019	1.767/0.419
030ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
031ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
032ftest	00010	0 -1 0.350	0.399/0.000	0.380/0.028	0.733	0.146/0.013	0.837/0.315
033ftest	00010	0 -1 0.350	0.414/0.000	0.414/0.021	0.844	0.093/0.020	1.607/0.554
034ftest	00010	0 -1 0.200	0.198/0.000	0.190/0.016	0.733	0.000/0.000	1.155/0.576
035ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
036ftest	00010	0 -1 0.600	0.671/0.000	0.883/0.057	0.822	0.487/0.015	1.322/0.274
037ftest	00010	0 -1 0.550	0.575/0.000	0.616/0.043	0.733	0.353/0.013	1.270/0.296
038ftest	00010	0 -1 0.250	0.262/0.000	0.266/0.014	0.756	0.044/0.016	0.000/0.000
039ftest	00010	0 -1 0.400	0.400/0.000	0.586/0.033	0.889	0.354/0.010	0.616/0.069
040ftest	00010	0 -1 0.200	0.201/0.000	0.247/0.015	0.733	0.055/0.014	0.892/0.297
041ftest	00011	0 -1 0.000	0.000/0.000	0.036/0.018	0.111	0.000/0.000	0.000/0.000
042ftest	00011	0 -1 1.200	1.236/0.000	1.634/0.094	0.889	1.057/0.017	1.820/0.248
043ftest	00011	0 -1 0.350	0.399/0.000	0.340/0.034	0.667	0.000/0.000	0.000/0.000
044ftest	00011	0 -1 1.700	1.733/0.000	1.566/0.115	0.689	1.298/0.038	3.889/0.924
045ftest	00011	0 -1 1.000	1.038/0.000	0.959/0.067	0.667	0.590/0.030	2.733/0.694
046ftest	00011	0 -1 0.950	0.996/0.000	0.922/0.065	0.689	0.493/0.036	2.989/0.843
047ftest	00011	0 -1 1.050	1.093/0.000	1.319/0.018	1.000	0.975/0.016	1.700/0.422
048ftest	00011	0 -1 1.100	1.153/0.000	1.416/0.024	1.000	1.031/0.018	1.933/0.600
049ftest	00011	0 -1 0.650	0.737/0.000	0.814/0.009	1.000	0.571/0.022	1.656/0.715
050ftest	00011	0 -1 1.300	1.371/0.000	1.236/0.091	0.689	1.029/0.020	2.290/0.507
051ftest	00011	0 -1 1.000	1.051/0.000	0.906/0.043	0.867	0.523/0.035	3.078/0.832
052ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
053ftest	00011	0 -1 1.650	1.659/0.000	2.148/0.109	0.889	1.387/0.029	2.978/0.483
054ftest	00011	0 -1 1.500	1.603/0.000	1.452/0.103	0.689	1.015/0.037	3.633/0.759
055ftest	00011	0 -1 0.100	0.105/0.000	0.082/0.026	0.222	0.000/0.000	0.000/0.000

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA	
056ftest	00011	0 -1	1.550	1.662/0.000	1.856/0.016	1.000	1.431/0.032	3.011/0.907
057ftest	00011	0 -1	1.250	1.307/0.000	1.220/0.069	0.822	1.098/0.022	2.133/0.467
058ftest	00011	0 -1	1.400	1.480/0.000	1.419/0.083	0.800	1.099/0.033	3.211/0.723
059ftest	00011	0 -1	1.050	1.122/0.000	0.974/0.070	0.822	0.785/0.026	2.189/0.748
060ftest	00011	0 -1	0.950	1.016/0.000	0.865/0.060	0.756	0.425/0.039	3.311/1.030
061ftest	00011	0 -1	1.600	1.603/0.000	1.474/0.088	0.822	1.195/0.037	4.388/0.965
062ftest	00011	0 -1	1.500	1.619/0.000	1.498/0.077	0.867	1.158/0.036	3.567/0.835
063ftest	00011	0 -1	1.550	1.674/0.000	1.590/0.106	0.756	1.062/0.039	3.733/0.815
064ftest	00011	0 -1	0.000	0.000/0.000	0.030/0.013	0.178	0.000/0.000	0.000/0.000
065ftest	00011	0 -1	1.100	1.164/0.000	1.128/0.071	0.800	0.818/0.026	2.478/0.547
066ftest	00011	0 -1	0.000	0.000/0.000	0.031/0.012	0.133	0.000/0.000	0.000/0.000
067ftest	00011	0 -1	1.000	1.047/0.000	0.922/0.060	0.822	0.467/0.037	3.643/0.776
068ftest	00011	0 -1	0.900	0.920/0.000	1.053/0.015	1.000	0.807/0.026	2.033/0.859
069ftest	00011	0 -1	0.000	0.000/0.000	0.033/0.016	0.111	0.000/0.000	0.000/0.000
070ftest	00011	0 -1	0.450	0.473/0.000	0.425/0.022	0.844	0.042/0.029	2.600/0.693
071ftest	00011	0 -1	0.900	0.936/0.000	0.769/0.051	0.778	0.500/0.040	3.333/1.085
072ftest	00011	0 -1	1.050	1.109/0.000	1.028/0.061	0.822	0.889/0.020	1.833/0.437
073ftest	00011	0 -1	1.500	1.615/0.000	1.453/0.102	0.689	1.143/0.041	3.911/0.884
074ftest	00011	0 -1	1.400	1.464/0.000	1.442/0.085	0.822	1.155/0.026	2.960/0.662
075ftest	00011	0 -1	0.400	0.412/0.000	0.390/0.030	0.667	0.000/0.000	2.433/0.953
076ftest	00011	0 -1	1.550	1.674/0.000	1.959/0.118	0.889	1.002/0.041	4.000/0.942
077ftest	00011	0 -1	1.150	1.248/0.000	1.142/0.083	0.756	0.877/0.027	2.311/0.709
078ftest	00011	0 -1	0.000	0.000/0.000	0.029/0.014	0.156	0.000/0.000	0.000/0.000
079ftest	00011	0 -1	1.450	1.529/0.000	1.814/0.020	1.000	1.359/0.021	2.333/0.497
080ftest	00011	0 -1	1.200	1.226/0.000	1.689/0.033	1.000	1.086/0.023	2.178/0.489
081ftest	00100	0 -1	0.400	0.398/0.000	0.521/0.009	1.000	0.412/0.010	0.559/0.009
082ftest	00100	0 -1	0.000	0.000/0.000	0.115/0.088	0.289	0.000/0.000	0.000/0.000
083ftest	00100	0 -1	0.050	0.050/0.000	0.068/0.002	0.956	0.035/0.010	0.065/0.001
084ftest	00100	0 -1	0.350	0.393/0.000	0.457/0.007	1.000	0.310/0.010	0.536/0.021
085ftest	00100	0 -1	0.000	0.000/0.000	0.063/0.059	0.156	0.000/0.000	0.000/0.000
086ftest	00100	0 -1	0.000	0.000/0.000	0.117/0.108	0.156	0.000/0.000	0.000/0.000
087ftest	00100	0 -1	0.000	0.000/0.000	0.063/0.059	0.156	0.000/0.000	0.000/0.000
088ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.355/0.358
089ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.389/0.390
090ftest	00100	0 -1	0.000	0.000/0.000	0.152/0.118	0.267	0.000/0.000	0.000/0.000
091ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.178/0.191
092ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
093ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.420/0.420
094ftest	00100	0 -1	0.000	0.000/0.000	0.045/0.024	0.178	0.000/0.000	0.000/0.000
095ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.447/0.439
096ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.006	0.489	0.000/0.000	0.000/0.000
097ftest	00100	0 -1	0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
098ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.455/0.449
099ftest	00100	0 -1	0.300	0.334/0.000	0.392/0.004	1.000	0.277/0.010	0.453/0.016
100ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.468/0.473
101ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.455/0.449
102ftest	00100	0 -1	0.350	0.393/0.000	0.457/0.007	1.000	0.310/0.010	0.536/0.021
103ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.329/0.329
104ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.145/0.159
105ftest	00100	0 -1	0.150	0.160/0.000	0.200/0.004	1.000	0.120/0.010	0.221/0.013
106ftest	00100	0 -1	0.000	0.000/0.000	0.063/0.059	0.156	0.000/0.000	0.000/0.000
107ftest	00100	0 -1	0.150	0.160/0.000	0.200/0.004	1.000	0.120/0.010	0.221/0.013
108ftest	00100	0 -1	0.500	0.514/0.000	0.622/0.002	1.000	0.478/0.010	0.704/0.024
109ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.355/0.358
110ftest	00100	0 -1	0.000	0.000/0.000	0.034/0.006	0.489	0.000/0.000	0.000/0.000

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA
111ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.230/0.239
112ftest	00100	0 -1 0.000	0.000/0.000	0.089/0.075	0.311	0.000/0.000	0.000/0.000
113ftest	00100	0 -1 0.250	0.254/0.000	0.324/0.004	1.000	0.216/0.010	0.368/0.019
114ftest	00100	0 -1 0.000	0.000/0.000	0.113/0.094	0.089	0.000/0.000	0.000/0.000
115ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.086/0.102
116ftest	00100	0 -1 0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
117ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.501/0.502
118ftest	00100	0 -1 0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
119ftest	00100	0 -1 0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
120ftest	00100	0 -1 0.300	0.334/0.000	0.392/0.004	1.000	0.277/0.010	0.453/0.016
121ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.677/0.652
122ftest	00101	0 -1 0.000	0.000/0.000	0.165/0.142	0.156	0.000/0.000	0.000/0.000
123ftest	00101	0 -1 0.000	0.028/0.000	0.261/0.225	0.133	0.000/0.000	0.000/0.000
124ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.537/0.530
125ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.659/0.649
126ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.903/0.881
127ftest	00101	0 -1 0.000	0.000/0.000	0.163/0.136	0.133	0.000/0.000	0.000/0.000
128ftest	00101	0 -1 0.000	0.000/0.000	0.254/0.212	0.133	0.000/0.000	0.000/0.000
129ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.716/0.710
130ftest	00101	0 -1 1.100	1.158/0.000	1.311/0.008	1.000	1.051/0.015	1.489/0.031
131ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.599/0.594
132ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.537/0.530
133ftest	00101	0 -1 1.200	1.228/0.000	1.431/0.016	1.000	1.165/0.016	1.590/0.030
134ftest	00101	0 -1 1.450	1.530/0.000	1.728/0.011	1.000	1.379/0.018	1.970/0.064
135ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.839/0.825
136ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.903/0.881
137ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.839/0.825
138ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.907/0.879
139ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.807/0.796
140ftest	00101	0 -1 1.000	1.030/0.000	1.183/0.010	1.000	0.971/0.014	1.330/0.064
141ftest	00101	0 -1 1.050	1.097/0.000	1.244/0.008	1.000	0.993/0.014	1.410/0.054
142ftest	00101	0 -1 1.350	1.418/0.000	1.605/0.010	1.000	1.303/0.017	1.830/0.064
143ftest	00101	0 -1 1.650	1.655/0.000	1.906/0.019	1.000	1.560/0.020	2.122/0.063
144ftest	00101	0 -1 0.000	0.000/0.000	0.142/0.125	0.133	0.000/0.000	0.000/0.000
145ftest	00101	0 -1 1.650	1.655/0.000	1.906/0.019	1.000	1.560/0.020	2.122/0.063
146ftest	00101	0 -1 0.000	0.000/0.000	0.222/0.187	0.133	0.000/0.000	0.000/0.000
147ftest	00101	0 -1 0.000	0.000/0.000	0.254/0.212	0.133	0.000/0.000	0.000/0.000
148ftest	00101	0 -1 1.600	1.591/0.000	1.894/0.029	1.000	1.555/0.020	2.089/0.031
149ftest	00101	0 -1 1.000	1.030/0.000	1.183/0.010	1.000	0.971/0.014	1.330/0.064
150ftest	00101	0 -1 0.000	0.000/0.000	0.165/0.142	0.156	0.000/0.000	0.000/0.000
151ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.626/0.618
152ftest	00101	0 -1 1.200	1.228/0.000	1.431/0.016	1.000	1.165/0.016	1.590/0.030
153ftest	00101	0 -1 0.000	0.000/0.000	0.190/0.160	0.133	0.000/0.000	0.000/0.000
154ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.781/0.765
155ftest	00101	0 -1 1.700	1.716/0.000	1.972/0.018	1.000	1.657/0.021	2.230/0.064
156ftest	00101	0 -1 1.450	1.530/0.000	1.728/0.011	1.000	1.379/0.018	1.970/0.064
157ftest	00101	0 -1 0.950	0.985/0.000	1.119/0.007	1.000	0.896/0.013	1.300/0.000
158ftest	00101	0 -1 1.450	1.530/0.000	1.728/0.011	1.000	1.379/0.018	1.970/0.064
159ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.677/0.652
160ftest	00101	0 -1 0.000	0.000/0.000	0.240/0.203	0.133	0.000/0.000	0.000/0.000
161ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
162ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
163ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
164ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
165ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA
166ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
167ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
168ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
169ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
170ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
171ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
172ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
173ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
174ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
175ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
176ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
177ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
178ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
179ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
180ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
181ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
182ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
183ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
184ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
185ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
186ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
187ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
188ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
189ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
190ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
191ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
192ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
193ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
194ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
195ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
196ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
197ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
198ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
199ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
200ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
201ftest	10010	0 -1 0.400	0.468/0.000	1.664/0.381	0.356	1.220/0.016	0.000/0.000
202ftest	10010	0 -1 0.150	0.134/0.000	0.887/0.242	0.311	0.000/0.000	0.000/0.000
203ftest	10010	0 -1 0.700	0.811/0.000	0.730/0.045	0.844	0.176/0.024	1.617/0.186
204ftest	10010	0 -1 0.050	0.050/0.000	0.114/0.049	0.222	1.720/0.022	0.000/0.000
205ftest	10010	0 -1 0.000	0.000/0.000	0.535/0.374	0.067	0.000/0.000	0.000/0.000
206ftest	10010	0 -1 0.000	0.000/0.000	0.086/0.075	0.089	0.000/0.000	0.460/0.258
207ftest	10010	0 -1 0.000	0.000/0.000	0.516/0.374	0.133	0.000/0.000	0.956/0.423
208ftest	10010	0 -1 0.700	0.805/0.000	0.866/0.007	1.000	2.029/0.026	1.422/0.376
209ftest	10010	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
210ftest	10010	0 -1 0.700	0.793/0.000	0.905/0.011	1.000	0.721/0.012	1.117/0.191
211ftest	10010	0 -1 0.150	0.156/0.000	0.347/0.034	0.667	0.000/0.000	0.650/0.367
212ftest	10010	0 -1 0.600	0.666/0.000	1.537/0.336	0.444	1.762/0.041	1.494/0.691
213ftest	10010	0 -1 0.550	0.575/0.000	1.400/0.480	0.578	0.373/0.018	1.010/0.159
214ftest	10010	0 -1 0.750	0.929/0.000	1.809/0.430	0.511	0.000/0.000	1.311/0.137
215ftest	10010	0 -1 0.250	0.263/0.000	0.417/0.038	0.489	1.449/0.033	1.371/0.490
216ftest	10010	0 -1 0.550	0.691/0.000	2.532/0.481	0.378	0.000/0.000	0.000/0.000
217ftest	10010	0 -1 0.650	0.773/0.000	0.836/0.045	0.733	0.000/0.000	2.000/0.492
218ftest	10010	0 -1 0.000	0.000/0.000	0.604/0.278	0.133	0.000/0.000	0.000/0.000
219ftest	10010	0 -1 0.000	0.055/0.000	0.333/0.091	0.400	1.698/0.039	0.724/0.631
220ftest	10010	0 -1 0.400	0.390/0.000	0.764/0.143	0.644	0.000/0.000	1.293/0.610

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA
221ftest	10010	0 -1 0.100	0.116/0.000	0.168/0.014	0.578	0.000/0.000	0.000/0.000
222ftest	10010	0 -1 0.800	0.791/0.000	0.775/0.053	0.756	0.900/0.032	1.756/0.400
223ftest	10010	0 -1 0.150	0.128/0.000	1.127/0.271	0.289	0.000/0.000	0.000/0.000
224ftest	10010	0 -1 0.600	0.700/0.000	0.705/0.028	0.889	0.347/0.014	1.214/0.302
225ftest	10010	0 -1 0.300	0.344/0.000	2.447/0.741	0.289	0.000/0.000	1.387/0.536
226ftest	10010	0 -1 0.700	0.742/0.000	2.438/0.436	0.444	2.941/0.038	2.144/1.009
227ftest	10010	0 -1 0.800	0.808/0.000	0.881/0.043	0.844	1.936/0.032	2.100/0.467
228ftest	10010	0 -1 0.000	0.043/0.000	0.271/0.200	0.156	0.554/0.015	0.000/0.000
229ftest	10010	0 -1 0.550	0.598/0.000	2.640/0.601	0.311	0.000/0.000	0.000/0.000
230ftest	10010	0 -1 0.750	0.871/0.000	1.397/0.083	0.889	0.000/0.000	2.122/0.941
231ftest	10010	0 -1 0.850	0.897/0.000	2.115/0.378	0.489	0.000/0.000	1.956/0.406
232ftest	10010	0 -1 0.600	0.697/0.000	1.005/0.090	0.689	0.000/0.000	1.731/0.858
233ftest	10010	0 -1 0.400	0.375/0.000	1.580/0.312	0.378	0.000/0.000	1.546/0.490
234ftest	10010	0 -1 0.600	0.704/0.000	0.782/0.063	0.711	0.000/0.000	1.756/0.374
235ftest	10010	0 -1 0.850	0.863/0.000	1.210/0.094	0.622	0.000/0.000	1.867/0.397
236ftest	10010	0 -1 0.250	0.217/0.000	0.287/0.021	0.711	0.044/0.035	1.081/0.476
237ftest	10010	0 -1 0.600	0.712/0.000	0.686/0.035	0.689	0.000/0.000	2.300/0.820
238ftest	10010	0 -1 0.000	0.000/0.000	0.619/0.259	0.178	0.000/0.000	0.000/0.000
239ftest	10010	0 -1 0.150	0.153/0.000	0.996/0.266	0.356	0.000/0.000	0.797/0.378
240ftest	10010	0 -1 0.100	0.091/0.000	0.117/0.007	0.911	0.209/0.010	0.293/0.092
241ftest	10011	0 -1 0.250	0.282/0.000	3.746/1.058	0.200	0.000/0.000	0.000/0.000
242ftest	10011	0 -1 0.000	0.067/0.000	0.907/0.720	0.089	0.000/0.000	0.000/0.000
244ftest	10011	0 -1 0.100	0.126/0.000	3.435/0.948	0.178	0.000/0.000	0.000/0.000
245ftest	10011	0 -1 1.500	1.632/0.000	1.528/0.064	0.889	0.430/0.024	3.356/0.698
246ftest	10011	0 -1 0.900	0.923/0.000	0.792/0.038	0.844	1.742/0.034	2.067/0.846
247ftest	10011	0 -1 1.350	1.449/0.000	1.944/0.074	0.911	0.852/0.024	2.833/0.937
248ftest	10011	0 -1 1.000	1.079/0.000	1.423/0.200	0.644	1.721/0.050	3.167/0.936
249ftest	10011	0 -1 1.050	1.119/0.000	0.819/0.045	0.733	0.000/0.000	3.344/1.094
250ftest	10011	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
251ftest	10011	0 -1 1.450	1.481/0.000	4.060/0.782	0.378	2.691/0.056	4.122/0.770
252ftest	10011	0 -1 1.600	1.544/0.000	3.964/0.713	0.511	0.000/0.000	3.522/0.760
253ftest	10011	0 -1 0.650	0.728/0.000	2.885/0.594	0.422	0.000/0.000	2.678/0.840
254ftest	10011	0 -1 1.150	1.235/0.000	1.793/0.059	0.933	1.042/0.032	2.256/0.467
255ftest	10011	0 -1 1.500	1.625/0.000	1.547/0.093	0.867	0.574/0.028	4.271/0.632
256ftest	10011	0 -1 0.900	0.949/0.000	0.916/0.063	0.756	2.877/0.041	2.389/0.559
257ftest	10011	0 -1 0.950	0.966/0.000	0.959/0.045	0.889	2.351/0.055	2.833/0.851
258ftest	10011	0 -1 1.550	1.705/0.000	1.723/0.064	0.800	0.171/0.026	3.078/0.855
259ftest	10011	0 -1 0.000	0.000/0.000	1.455/0.807	0.267	0.000/0.000	0.000/0.000
260ftest	10011	0 -1 1.650	1.604/0.000	2.647/0.204	0.667	2.572/0.056	2.567/0.337
261ftest	10011	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
262ftest	10011	0 -1 0.900	1.005/0.000	0.523/0.054	0.622	0.082/0.048	3.422/1.067
263ftest	10011	0 -1 0.250	0.281/0.000	2.282/0.645	0.333	0.000/0.000	2.293/0.990
264ftest	10011	0 -1 0.900	0.995/0.000	2.487/0.664	0.489	0.000/0.000	3.044/0.827
265ftest	10011	0 -1 0.900	0.915/0.000	2.340/0.645	0.444	0.000/0.000	0.000/0.000
266ftest	10011	0 -1 0.450	0.479/0.000	2.912/0.624	0.311	1.883/0.040	1.895/1.080
267ftest	10011	0 -1 1.400	1.450/0.000	1.302/0.093	0.733	0.000/0.000	2.489/0.640
268ftest	10011	0 -1 1.150	1.172/0.000	1.751/0.098	0.889	1.121/0.041	2.622/1.098
269ftest	10011	0 -1 1.600	1.690/0.000	1.866/0.103	0.711	0.000/0.000	5.856/2.379
270ftest	10011	0 -1 1.200	1.259/0.000	1.816/0.089	0.933	0.253/0.051	2.578/0.866
271ftest	10011	0 -1 0.550	0.657/0.000	0.578/0.047	0.689	0.000/0.000	2.222/0.715
272ftest	10011	0 -1 1.450	1.568/0.000	1.843/0.050	0.956	0.000/0.000	2.067/0.094
273ftest	10011	0 -1 1.500	1.644/0.000	2.440/0.227	0.667	0.859/0.019	3.478/1.850
274ftest	10011	0 -1 0.900	0.932/0.000	0.766/0.038	0.844	0.386/0.031	0.000/0.000
275ftest	10011	0 -1 1.450	1.528/0.000	1.588/0.102	0.711	0.000/0.000	3.620/1.019
276ftest	10011	0 -1 0.650	0.725/0.000	0.825/0.011	1.000	0.000/0.000	2.280/0.869

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA	
277ftest	10011	0 -1	1.550	1.736/0.000	1.857/0.071	0.911	1.385/0.025	3.713/0.491
278ftest	10011	0 -1	1.600	1.680/0.000	1.624/0.095	0.911	0.261/0.022	3.078/0.718
279ftest	10011	0 -1	0.850	0.796/0.000	3.023/0.621	0.422	1.045/0.032	2.789/0.857
280ftest	10011	0 -1	1.250	1.300/0.000	1.425/0.047	0.867	0.000/0.000	2.090/0.487
281ftest	10100	0 -1	0.000	0.000/0.000	0.326/0.239	0.111	0.000/0.000	0.000/0.000
282ftest	10100	0 -1	0.000	0.040/0.000	0.991/0.496	0.067	0.338/0.016	0.000/0.000
283ftest	10100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.329/0.334
284ftest	10100	0 -1	0.850	0.853/0.000	0.987/0.015	1.000	0.000/0.000	1.256/0.195
285ftest	10100	0 -1	0.000	0.000/0.000	0.441/0.279	0.244	1.462/0.028	0.000/0.000
286ftest	10100	0 -1	0.000	0.049/0.000	0.210/0.162	0.156	0.000/0.000	0.000/0.000
287ftest	10100	0 -1	0.100	0.181/0.000	0.263/0.066	0.556	0.000/0.000	0.000/0.000
288ftest	10100	0 -1	0.750	0.856/0.000	0.949/0.009	1.000	0.000/0.000	1.108/0.058
289ftest	10100	0 -1	0.800	0.808/0.000	1.280/0.364	0.444	0.000/0.000	1.033/0.047
290ftest	10100	0 -1	0.600	0.679/0.000	0.751/0.003	1.000	1.465/0.021	0.853/0.028
291ftest	10100	0 -1	0.000	0.000/0.000	0.941/0.273	0.222	0.000/0.000	0.000/0.000
292ftest	10100	0 -1	0.250	0.286/0.000	0.509/0.142	0.600	0.000/0.000	0.000/0.000
293ftest	10100	0 -1	0.500	0.512/0.000	0.620/0.004	1.000	0.552/0.011	0.704/0.024
294ftest	10100	0 -1	0.850	0.921/0.000	1.038/0.032	0.911	0.773/0.015	0.000/0.000
295ftest	10100	0 -1	0.000	0.039/0.000	0.227/0.115	0.156	0.000/0.000	0.000/0.000
296ftest	10100	0 -1	0.000	0.000/0.000	0.153/0.110	0.044	1.605/0.034	0.670/0.856
297ftest	10100	0 -1	0.000	0.000/0.000	0.768/0.418	0.000	0.000/0.000	0.000/0.000
298ftest	10100	0 -1	0.650	0.772/0.000	0.680/0.103	0.644	0.000/0.000	0.000/0.000
299ftest	10100	0 -1	0.650	0.774/0.000	1.142/0.256	0.378	0.000/0.000	1.118/0.291
300ftest	10100	0 -1	0.000	0.000/0.000	0.921/0.276	0.222	0.000/0.000	0.000/0.000
301ftest	10100	0 -1	0.750	0.851/0.000	0.944/0.006	1.000	0.000/0.000	1.125/0.043
302ftest	10100	0 -1	0.000	0.042/0.000	0.148/0.111	0.156	2.412/0.028	0.000/0.000
303ftest	10100	0 -1	0.000	0.082/0.000	0.081/0.046	0.133	0.000/0.000	0.000/0.000
304ftest	10100	0 -1	0.000	0.000/0.000	0.296/0.170	0.289	0.000/0.000	0.000/0.000
305ftest	10100	0 -1	0.100	0.099/0.000	0.132/0.002	1.000	0.000/0.000	0.142/0.007
306ftest	10100	0 -1	0.000	0.055/0.000	1.653/0.389	0.244	0.000/0.000	0.000/0.000
307ftest	10100	0 -1	0.000	0.000/0.000	0.163/0.121	0.311	0.000/0.000	0.000/0.000
308ftest	10100	0 -1	0.800	0.828/0.000	1.025/0.026	0.956	1.965/0.030	1.100/0.094
309ftest	10100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.453/0.450
310ftest	10100	0 -1	0.350	0.391/0.000	0.454/0.008	1.000	2.728/0.034	0.530/0.037
311ftest	10100	0 -1	0.450	0.502/0.000	0.614/0.037	0.867	4.735/0.057	0.739/0.113
312ftest	10100	0 -1	0.000	0.000/0.000	0.057/0.025	0.200	0.000/0.000	0.000/0.000
313ftest	10100	0 -1	0.000	0.028/0.000	0.207/0.121	0.111	0.000/0.000	0.000/0.000
314ftest	10100	0 -1	0.150	0.167/0.000	1.110/0.668	0.600	0.564/0.015	0.220/0.013
315ftest	10100	0 -1	0.000	0.000/0.000	0.316/0.102	0.222	0.000/0.000	0.534/0.420
316ftest	10100	0 -1	0.000	0.057/0.000	0.546/0.259	0.156	0.408/0.030	0.000/0.000
317ftest	10100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.454/0.435
318ftest	10100	0 -1	0.000	0.062/0.000	0.000/0.000	0.200	0.000/0.000	0.404/0.304
319ftest	10100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.447/0.439
320ftest	10100	0 -1	0.000	0.000/0.000	0.408/0.205	0.044	0.000/0.000	0.000/0.000
321ftest	10101	0 -1	1.600	1.608/0.000	2.846/0.482	0.622	0.000/0.000	2.200/0.176
322ftest	10101	0 -1	0.000	0.080/0.000	2.056/0.622	0.200	0.000/0.000	0.000/0.000
323ftest	10101	0 -1	0.000	0.048/0.000	0.414/0.162	0.178	0.000/0.000	0.000/0.000
324ftest	10101	0 -1	1.600	1.585/0.000	2.504/0.318	0.578	1.775/0.049	2.244/0.259
325ftest	10101	0 -1	1.200	1.239/0.000	2.768/0.762	0.489	0.192/0.011	1.678/0.225
326ftest	10101	0 -1	1.150	1.222/0.000	1.375/0.007	1.000	2.466/0.029	1.567/0.067
327ftest	10101	0 -1	0.000	0.026/0.000	1.242/0.499	0.200	0.000/0.000	0.000/0.000
328ftest	10101	0 -1	0.000	0.074/0.000	0.388/0.224	0.178	0.000/0.000	0.000/0.000
329ftest	10101	0 -1	1.350	1.492/0.000	1.626/0.022	1.000	0.989/0.016	1.922/0.131
330ftest	10101	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.537/0.530
331ftest	10101	0 -1	1.200	1.195/0.000	1.403/0.013	1.000	0.000/0.000	1.580/0.040

1254	Scenario	Known	MLR	N-NET	N-NE(id)	PCR	PA
332ftest	10101	0 -1 0.000	0.045/0.000	0.459/0.141	0.356	0.000/0.000	0.000/0.000
333ftest	10101	0 -1 1.000	1.050/0.000	1.239/0.032	0.956	1.975/0.053	1.400/0.141
334ftest	10101	0 -1 0.000	0.000/0.000	0.195/0.033	0.422	0.000/0.000	0.000/0.000
335ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.562/0.561
336ftest	10101	0 -1 0.000	0.000/0.000	0.163/0.130	0.111	0.000/0.000	0.000/0.000
337ftest	10101	0 -1 0.000	0.000/0.000	0.421/0.141	0.311	0.000/0.000	0.000/0.000
338ftest	10101	0 -1 0.000	0.094/0.000	0.904/0.318	0.133	0.000/0.000	0.000/0.000
339ftest	10101	0 -1 1.150	1.225/0.000	1.345/0.027	1.000	2.528/0.033	1.570/0.064
340ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.698/0.022	0.770/0.753
341ftest	10101	0 -1 0.000	0.029/0.000	0.110/0.078	0.156	0.637/0.044	0.992/0.856
342ftest	10101	0 -1 0.000	0.000/0.000	0.972/0.816	0.111	0.293/0.028	0.970/0.719
343ftest	10101	0 -1 0.000	0.028/0.000	0.376/0.265	0.111	0.000/0.000	0.000/0.000
344ftest	10101	0 -1 0.000	0.075/0.000	0.311/0.210	0.244	0.000/0.000	0.000/0.000
345ftest	10101	0 -1 0.000	0.000/0.000	0.181/0.152	0.133	0.000/0.000	0.000/0.000
346ftest	10101	0 -1 0.000	0.000/0.000	0.528/0.316	0.133	1.446/0.023	0.000/0.000
347ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.978/1.029
348ftest	10101	0 -1 0.000	0.028/0.000	0.489/0.290	0.133	0.751/0.078	0.000/0.000
349ftest	10101	0 -1 0.000	0.000/0.000	0.544/0.359	0.111	0.000/0.000	0.000/0.000
350ftest	10101	0 -1 0.000	0.000/0.000	0.213/0.107	0.133	0.000/0.000	1.034/0.924
351ftest	10101	0 -1 0.000	0.052/0.000	0.257/0.147	0.133	0.000/0.000	0.000/0.000
352ftest	10101	0 -1 0.000	0.000/0.000	0.159/0.143	0.156	0.000/0.000	0.000/0.000
353ftest	10101	0 -1 1.350	1.428/0.000	1.605/0.009	1.000	0.000/0.000	1.889/0.185
354ftest	10101	0 -1 0.000	0.000/0.000	2.308/0.534	0.267	2.406/0.039	0.000/0.000
355ftest	10101	0 -1 1.400	1.473/0.000	1.670/0.012	1.000	1.342/0.017	1.920/0.060
356ftest	10101	0 -1 1.600	1.580/0.000	1.909/0.054	0.933	2.301/0.031	2.089/0.057
357ftest	10101	0 -1 0.000	0.000/0.000	1.851/0.694	0.200	0.000/0.000	0.000/0.000
358ftest	10101	0 -1 0.000	0.000/0.000	0.290/0.166	0.111	2.165/0.034	0.000/0.000
359ftest	10101	0 -1 0.000	0.037/0.000	0.292/0.152	0.089	0.000/0.000	0.877/0.732
360ftest	10101	0 -1 0.000	0.034/0.000	0.295/0.183	0.067	0.000/0.000	0.000/0.000
361ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
362ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
363ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
364ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
365ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
366ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
367ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
368ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
369ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
370ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
371ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
372ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
373ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
374ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
375ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
376ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
377ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
378ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
379ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
380ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
381ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
382ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
383ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
384ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
385ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
386ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1254	Scenario	Known		MLR	N-NET	N-NE(id)	PCR	PA
387ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
388ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
389ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
390ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
391ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
392ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
393ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
394ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
395ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
396ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
397ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
398ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
399ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
400ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0 -1 0.850	0.857/0.000	1.009/0.013	1.000	1.021/0.013	1.433/0.467
002ftest	00010	0 -1 0.200	0.202/0.000	0.253/0.012	0.756	0.356/0.015	1.438/1.273
003ftest	00010	0 -1 0.200	0.194/0.000	0.301/0.007	0.978	0.325/0.009	0.989/0.738
004ftest	00010	0 -1 0.100	0.099/0.000	0.131/0.002	1.000	0.142/0.008	0.186/0.126
005ftest	00010	0 -1 0.100	0.097/0.000	0.151/0.004	0.978	0.189/0.011	0.591/0.689
006ftest	00010	0 -1 0.750	0.824/0.000	1.063/0.032	0.889	1.062/0.014	2.022/0.999
007ftest	00010	0 -1 0.450	0.450/0.000	0.661/0.029	0.844	0.661/0.012	1.551/0.982
008ftest	00010	0 -1 0.750	0.835/0.000	1.018/0.019	1.000	1.064/0.016	1.922/1.051
009ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.324/0.367
010ftest	00010	0 -1 0.750	0.842/0.000	0.986/0.015	1.000	1.019/0.013	1.553/0.631
011ftest	00010	0 -1 0.550	0.574/0.000	0.708/0.015	1.000	0.786/0.015	1.319/0.811
012ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.079/0.010	0.404/0.568
013ftest	00010	0 -1 0.100	0.098/0.000	0.151/0.004	0.978	0.184/0.008	0.500/0.376
014ftest	00010	0 -1 0.300	0.330/0.000	0.462/0.014	0.978	0.518/0.014	1.351/1.089
015ftest	00010	0 -1 0.500	0.503/0.000	0.695/0.016	0.978	0.745/0.014	1.578/1.043
016ftest	00010	0 -1 0.500	0.510/0.000	0.620/0.009	1.000	0.672/0.014	0.978/0.619
017ftest	00010	0 -1 0.750	0.841/0.000	0.971/0.015	1.000	0.981/0.013	1.419/0.540
018ftest	00010	0 -1 0.100	0.098/0.000	0.137/0.006	0.711	0.252/0.012	1.303/1.237
019ftest	00010	0 -1 0.150	0.164/0.000	0.247/0.010	0.956	0.309/0.012	1.067/0.994
020ftest	00010	0 -1 0.800	0.787/0.000	0.990/0.020	1.000	0.914/0.012	1.644/0.617
021ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.071/0.010	0.854/0.927
022ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.076/0.010	0.962/1.002
023ftest	00010	0 -1 0.600	0.648/0.000	0.831/0.021	0.956	0.844/0.013	1.707/0.961
024ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.121/0.012	0.770/0.971
025ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.041/0.008	0.403/0.453
026ftest	00010	0 -1 0.650	0.717/0.000	0.803/0.013	1.000	0.816/0.012	0.973/0.261
027ftest	00010	0 -1 0.500	0.510/0.000	0.636/0.009	1.000	0.659/0.010	0.924/0.301
028ftest	00010	0 -1 0.750	0.842/0.000	1.057/0.026	0.956	1.063/0.018	2.189/1.269
029ftest	00010	0 -1 0.500	0.500/0.000	0.707/0.019	0.978	0.726/0.016	1.764/1.232
030ftest	00010	0 -1 0.500	0.509/0.000	0.595/0.021	0.978	0.630/0.013	0.873/0.506
031ftest	00010	0 -1 0.600	0.654/0.000	0.734/0.012	1.000	0.731/0.010	0.841/0.134
032ftest	00010	0 -1 0.550	0.565/0.000	0.738/0.014	1.000	0.767/0.010	1.259/0.538
033ftest	00010	0 -1 0.750	0.834/0.000	0.996/0.017	1.000	1.033/0.017	1.754/0.950
034ftest	00010	0 -1 0.800	0.792/0.000	0.940/0.011	1.000	0.947/0.012	1.376/0.496
035ftest	00010	0 -1 0.800	0.791/0.000	0.885/0.026	0.978	0.895/0.015	1.199/0.533
036ftest	00010	0 -1 0.200	0.196/0.000	0.319/0.007	0.978	0.341/0.012	1.227/1.040
037ftest	00010	0 -1 0.350	0.389/0.000	0.512/0.023	0.956	0.574/0.010	1.288/0.818
038ftest	00010	0 -1 0.700	0.777/0.000	0.911/0.014	1.000	0.936/0.013	1.401/0.551
039ftest	00010	0 -1 0.100	0.096/0.000	0.125/0.004	0.778	0.154/0.008	0.677/0.489
040ftest	00010	0 -1 0.300	0.329/0.000	0.414/0.007	1.000	0.463/0.011	0.871/0.633
041ftest	00011	0 -1 1.350	1.399/0.000	1.563/0.037	1.000	1.594/0.021	1.967/0.653
042ftest	00011	0 -1 0.300	0.320/0.000	0.372/0.015	0.778	0.474/0.013	1.891/1.341
043ftest	00011	0 -1 1.700	1.704/0.000	2.006/0.026	1.000	2.038/0.023	2.789/0.813
044ftest	00011	0 -1 1.450	1.496/0.000	1.977/0.058	0.933	1.867/0.031	4.167/2.353
045ftest	00011	0 -1 0.950	0.971/0.000	1.253/0.029	0.978	1.273/0.024	2.767/1.768
046ftest	00011	0 -1 1.050	1.077/0.000	1.363/0.025	0.978	1.425/0.029	2.967/1.945
047ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.103/0.013	1.412/1.429
048ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.118/0.015	1.560/1.604
049ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.356	0.116/0.018	1.252/1.536
050ftest	00011	0 -1 0.700	0.765/0.000	1.041/0.033	0.933	0.987/0.016	2.533/1.485
051ftest	00011	0 -1 1.150	1.194/0.000	1.540/0.047	0.867	1.558/0.028	3.133/1.906
052ftest	00011	0 -1 1.250	1.277/0.000	1.453/0.023	1.000	1.469/0.020	1.844/0.662
053ftest	00011	0 -1 0.350	0.389/0.000	0.476/0.029	0.644	0.625/0.023	2.730/2.275
054ftest	00011	0 -1 1.150	1.196/0.000	1.598/0.048	0.956	1.595/0.030	3.700/2.365
055ftest	00011	0 -1 0.950	0.979/0.000	1.127/0.015	1.000	1.157/0.018	1.622/0.713

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
056ftest	00011	0 -1 0.000	0.000/0.000	0.047/0.006	0.356	0.166/0.026	2.410/2.631
057ftest	00011	0 -1 0.900	0.898/0.000	1.247/0.053	0.844	1.098/0.018	2.667/1.415
058ftest	00011	0 -1 0.600	0.644/0.000	0.953/0.040	0.800	0.908/0.026	2.944/2.339
059ftest	00011	0 -1 1.450	1.494/0.000	1.884/0.043	0.978	1.766/0.021	3.167/1.251
060ftest	00011	0 -1 1.500	1.551/0.000	1.903/0.031	1.000	1.931/0.032	3.544/1.932
061ftest	00011	0 -1 1.550	1.625/0.000	2.112/0.069	0.867	1.980/0.030	4.100/2.077
062ftest	00011	0 -1 0.700	0.758/0.000	1.095/0.042	0.822	1.060/0.029	3.322/2.602
063ftest	00011	0 -1 1.050	1.068/0.000	1.472/0.047	0.933	1.483/0.031	3.711/2.595
064ftest	00011	0 -1 1.200	1.214/0.000	1.356/0.033	0.978	1.390/0.019	1.744/0.627
065ftest	00011	0 -1 0.500	0.504/0.000	0.783/0.033	0.733	0.777/0.021	2.339/1.836
066ftest	00011	0 -1 1.000	1.020/0.000	1.125/0.039	0.956	1.196/0.025	1.711/1.025
067ftest	00011	0 -1 1.550	1.626/0.000	2.015/0.045	0.978	1.997/0.030	3.556/1.785
068ftest	00011	0 -1 0.000	0.000/0.000	0.032/0.004	0.333	0.114/0.021	1.517/1.783
069ftest	00011	0 -1 1.150	1.205/0.000	1.337/0.035	0.978	1.393/0.021	1.800/0.747
070ftest	00011	0 -1 1.350	1.396/0.000	1.665/0.025	1.000	1.683/0.024	2.622/1.168
071ftest	00011	0 -1 1.650	1.636/0.000	2.037/0.040	1.000	1.974/0.033	3.611/1.924
072ftest	00011	0 -1 0.850	0.843/0.000	1.150/0.044	0.844	1.040/0.016	2.367/1.228
073ftest	00011	0 -1 1.250	1.257/0.000	1.680/0.043	0.956	1.625/0.033	3.922/2.551
074ftest	00011	0 -1 1.000	1.017/0.000	1.402/0.062	0.844	1.285/0.021	3.089/1.775
075ftest	00011	0 -1 1.400	1.441/0.000	1.682/0.031	1.000	1.722/0.027	2.700/1.364
076ftest	00011	0 -1 1.150	1.191/0.000	1.647/0.072	0.844	1.644/0.034	3.978/2.652
077ftest	00011	0 -1 1.400	1.424/0.000	1.836/0.048	0.956	1.731/0.021	3.267/1.386
078ftest	00011	0 -1 1.100	1.140/0.000	1.268/0.036	0.978	1.326/0.023	1.767/0.864
079ftest	00011	0 -1 0.000	0.000/0.000	0.041/0.007	0.311	0.137/0.017	1.963/1.940
080ftest	00011	0 -1 0.100	0.100/0.000	0.130/0.012	0.667	0.232/0.018	1.837/1.782
081ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.547/0.507
082ftest	00100	0 -1 0.550	0.568/0.000	0.678/0.011	1.000	0.663/0.009	0.730/0.054
083ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.076/0.093
084ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.044/0.008	0.525/0.570
085ftest	00100	0 -1 0.400	0.398/0.000	0.503/0.003	1.000	0.426/0.008	0.553/0.005
086ftest	00100	0 -1 0.800	0.798/0.000	0.962/0.011	1.000	0.821/0.010	1.050/0.050
087ftest	00100	0 -1 0.400	0.398/0.000	0.503/0.003	1.000	0.426/0.008	0.553/0.005
088ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.000/0.000
089ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.027/0.010	0.000/0.000
090ftest	00100	0 -1 0.750	0.834/0.000	0.933/0.016	1.000	0.912/0.011	1.065/0.079
091ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
092ftest	00100	0 -1 0.100	0.100/0.000	0.134/0.001	1.000	0.117/0.008	0.136/0.005
093ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.038/0.011	0.000/0.000
094ftest	00100	0 -1 0.150	0.160/0.000	0.199/0.003	1.000	0.195/0.008	0.204/0.015
095ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
096ftest	00100	0 -1 0.650	0.713/0.000	0.798/0.012	1.000	0.779/0.010	0.887/0.070
097ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.155/0.177
098ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.051/0.011	0.000/0.000
099ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.026/0.008	0.443/0.474
100ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
101ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.051/0.011	0.000/0.000
102ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.044/0.008	0.525/0.570
103ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.030/0.009	0.000/0.000
104ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
105ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.234/0.268
106ftest	00100	0 -1 0.400	0.398/0.000	0.503/0.003	1.000	0.426/0.008	0.553/0.005
107ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.234/0.268
108ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.027/0.008	0.656/0.644
109ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.000/0.000
110ftest	00100	0 -1 0.650	0.713/0.000	0.798/0.012	1.000	0.779/0.010	0.887/0.070

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
111ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
112ftest	00100	0 -1 0.500	0.509/0.000	0.611/0.008	1.000	0.593/0.009	0.665/0.043
113ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.031/0.008	0.371/0.406
114ftest	00100	0 -1 0.600	0.652/0.000	0.744/0.008	1.000	0.709/0.009	0.804/0.043
115ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.000/0.000
116ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008	0.281/0.006
117ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
118ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.155/0.177
119ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008	0.281/0.006
120ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.026/0.008	0.443/0.474
121ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.029/0.014	0.000/0.000
122ftest	00101	0 -1 1.000	1.020/0.000	1.175/0.014	1.000	1.118/0.012	1.290/0.083
123ftest	00101	0 -1 1.550	1.622/0.000	1.838/0.030	1.000	1.802/0.018	2.020/0.154
124ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.038/0.012	0.000/0.000
125ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.052/0.014	0.000/0.000
126ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.084/0.018	0.000/0.000
127ftest	00101	0 -1 0.950	0.972/0.000	1.106/0.017	1.000	1.084/0.012	1.230/0.090
128ftest	00101	0 -1 1.450	1.502/0.000	1.707/0.028	1.000	1.639/0.016	1.889/0.145
129ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.040/0.015	0.000/0.000
130ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.072/0.012	1.393/1.342
131ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.038/0.013	0.000/0.000
132ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.038/0.012	0.000/0.000
133ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.378	0.052/0.013	1.497/1.378
134ftest	00101	0 -1 0.000	0.000/0.000	0.042/0.006	0.311	0.103/0.015	1.827/1.730
135ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.061/0.017	0.000/0.000
136ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.084/0.018	0.000/0.000
137ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.061/0.017	0.000/0.000
138ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.049/0.018	0.000/0.000
139ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.048/0.017	0.000/0.000
140ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.378	0.046/0.011	1.243/1.174
141ftest	00101	0 -1 0.000	0.000/0.000	0.027/0.004	0.356	0.077/0.012	1.303/1.240
142ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.006	0.311	0.087/0.014	1.701/1.610
143ftest	00101	0 -1 0.000	0.000/0.000	0.125/0.039	0.222	0.102/0.016	1.970/1.826
144ftest	00101	0 -1 0.900	0.910/0.000	1.044/0.014	1.000	1.003/0.011	1.130/0.078
145ftest	00101	0 -1 0.000	0.000/0.000	0.125/0.039	0.222	0.102/0.016	1.970/1.826
146ftest	00101	0 -1 1.300	1.332/0.000	1.521/0.023	1.000	1.441/0.015	1.670/0.119
147ftest	00101	0 -1 1.450	1.502/0.000	1.707/0.028	1.000	1.639/0.016	1.889/0.145
148ftest	00101	0 -1 0.000	0.000/0.000	0.104/0.044	0.222	0.061/0.016	1.936/1.745
149ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.378	0.046/0.011	1.243/1.174
150ftest	00101	0 -1 1.000	1.020/0.000	1.175/0.014	1.000	1.118/0.012	1.290/0.083
151ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.037/0.014	0.000/0.000
152ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.378	0.052/0.013	1.497/1.378
153ftest	00101	0 -1 1.100	1.138/0.000	1.299/0.018	1.000	1.263/0.013	1.475/0.066
154ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.057/0.016	0.000/0.000
155ftest	00101	0 -1 0.000	0.000/0.000	0.033/0.006	0.422	0.077/0.017	2.056/1.897
156ftest	00101	0 -1 0.000	0.000/0.000	0.042/0.006	0.311	0.103/0.015	1.827/1.730
157ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.067/0.011	1.181/1.120
158ftest	00101	0 -1 0.000	0.000/0.000	0.042/0.006	0.311	0.103/0.015	1.827/1.730
159ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.029/0.014	0.000/0.000
160ftest	00101	0 -1 1.400	1.442/0.000	1.652/0.022	1.000	1.562/0.016	1.820/0.133
161ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
162ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
163ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
164ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
165ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
166ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
167ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
168ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
169ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
170ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
171ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
172ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
173ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
174ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
175ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
176ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
177ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
178ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
179ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
180ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
181ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
182ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
183ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
184ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
185ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
186ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
187ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
188ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
189ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
190ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
191ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
192ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
193ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
194ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
195ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
196ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
197ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
198ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
199ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
200ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
201ftest	10010	0 -1 0.800	0.820/0.000	1.250/0.236	0.667	0.000/0.000	0.000/0.000
202ftest	10010	0 -1 0.550	0.668/0.000	1.040/0.190	0.533	4.028/0.046	0.000/0.000
203ftest	10010	0 -1 0.400	0.395/0.000	0.620/0.035	0.711	1.480/0.019	1.496/0.901
204ftest	10010	0 -1 0.300	0.390/0.000	0.387/0.007	1.000	0.346/0.018	0.000/0.000
205ftest	10010	0 -1 0.650	0.727/0.000	0.850/0.042	0.956	2.892/0.047	0.000/0.000
206ftest	10010	0 -1 0.200	0.197/0.000	0.251/0.004	1.000	0.042/0.010	0.450/0.325
207ftest	10010	0 -1 0.600	0.707/0.000	0.751/0.031	0.889	1.694/0.021	0.950/0.280
208ftest	10010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
209ftest	10010	0 -1 0.150	0.161/0.000	0.198/0.004	1.000	0.316/0.009	0.310/0.226
210ftest	10010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	1.024/1.055
211ftest	10010	0 -1 0.000	0.051/0.000	0.119/0.067	0.156	0.380/0.022	0.475/0.761
212ftest	10010	0 -1 0.000	0.044/0.000	0.424/0.156	0.178	0.000/0.000	2.055/1.802
213ftest	10010	0 -1 0.050	0.068/0.000	0.283/0.082	0.267	0.000/0.000	0.853/0.846
214ftest	10010	0 -1 0.100	0.102/0.000	0.391/0.104	0.267	2.105/0.038	0.000/0.000
215ftest	10010	0 -1 0.650	0.744/0.000	0.902/0.048	0.867	1.224/0.026	0.000/0.000
216ftest	10010	0 -1 0.750	0.823/0.000	1.226/0.249	0.511	1.983/0.027	0.000/0.000
217ftest	10010	0 -1 0.650	0.754/0.000	0.982/0.052	0.844	2.648/0.037	2.367/1.259
218ftest	10010	0 -1 0.600	0.657/0.000	0.723/0.039	0.889	0.947/0.014	1.127/0.526
219ftest	10010	0 -1 0.200	0.247/0.000	0.766/0.210	0.333	0.344/0.032	0.000/0.000
220ftest	10010	0 -1 0.000	0.053/0.000	0.119/0.038	0.178	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
221ftest	10010	0 -1 0.600	0.681/0.000	0.758/0.012	1.000	3.655/0.034	0.000/0.000
222ftest	10010	0 -1 0.450	0.459/0.000	0.673/0.025	0.867	2.003/0.026	0.000/0.000
223ftest	10010	0 -1 0.800	0.850/0.000	1.589/0.479	0.600	3.675/0.042	2.233/1.529
224ftest	10010	0 -1 0.000	0.031/0.000	0.000/0.000	0.156	0.173/0.012	0.891/0.939
225ftest	10010	0 -1 0.700	0.840/0.000	1.563/0.437	0.556	4.572/0.061	0.000/0.000
226ftest	10010	0 -1 0.800	0.884/0.000	1.188/0.096	0.689	0.000/0.000	2.244/1.193
227ftest	10010	0 -1 0.600	0.738/0.000	0.894/0.038	0.822	0.823/0.026	1.917/1.029
228ftest	10010	0 -1 0.650	0.738/0.000	0.786/0.012	1.000	0.594/0.012	0.891/0.105
229ftest	10010	0 -1 0.800	0.842/0.000	1.573/0.378	0.444	2.292/0.038	1.944/1.050
230ftest	10010	0 -1 0.400	0.418/0.000	0.568/0.080	0.622	1.779/0.034	0.000/0.000
231ftest	10010	0 -1 0.600	0.660/0.000	0.940/0.071	0.644	3.225/0.042	2.048/1.373
232ftest	10010	0 -1 0.000	0.000/0.000	0.166/0.061	0.156	5.732/0.063	0.000/0.000
233ftest	10010	0 -1 0.550	0.693/0.000	1.043/0.241	0.467	5.273/0.057	1.910/1.283
234ftest	10010	0 -1 0.650	0.711/0.000	0.906/0.032	0.889	3.347/0.044	0.000/0.000
235ftest	10010	0 -1 0.300	0.361/0.000	0.454/0.009	1.000	1.984/0.023	1.779/1.694
236ftest	10010	0 -1 0.000	0.089/0.000	0.297/0.081	0.267	1.863/0.028	0.000/0.000
237ftest	10010	0 -1 0.650	0.721/0.000	0.912/0.029	0.867	4.233/0.062	1.822/1.037
238ftest	10010	0 -1 0.550	0.683/0.000	0.640/0.025	0.889	0.447/0.016	0.000/0.000
239ftest	10010	0 -1 0.500	0.568/0.000	0.737/0.084	0.689	2.663/0.033	1.529/0.991
240ftest	10010	0 -1 0.050	0.098/0.000	0.072/0.004	0.756	0.000/0.000	0.274/0.259
241ftest	10011	0 -1 1.650	1.666/0.000	2.429/0.309	0.667	5.921/0.059	2.878/1.278
242ftest	10011	0 -1 1.500	1.571/0.000	1.799/0.041	0.978	2.300/0.043	2.311/0.694
244ftest	10011	0 -1 1.550	1.665/0.000	2.119/0.297	0.578	3.693/0.042	0.000/0.000
245ftest	10011	0 -1 0.950	0.955/0.000	1.348/0.052	0.844	1.589/0.019	3.356/2.193
246ftest	10011	0 -1 1.700	1.704/0.000	2.090/0.036	1.000	1.557/0.028	3.222/1.013
247ftest	10011	0 -1 0.000	0.037/0.000	0.195/0.131	0.067	0.851/0.020	0.000/0.000
248ftest	10011	0 -1 0.650	0.774/0.000	1.075/0.064	0.733	2.724/0.041	0.000/0.000
249ftest	10011	0 -1 1.450	1.506/0.000	2.006/0.078	0.889	2.913/0.031	3.489/1.906
250ftest	10011	0 -1 1.250	1.328/0.000	1.532/0.061	0.889	2.832/0.032	0.000/0.000
251ftest	10011	0 -1 1.200	1.244/0.000	2.021/0.348	0.644	0.948/0.045	0.000/0.000
252ftest	10011	0 -1 1.150	1.273/0.000	1.776/0.109	0.689	3.009/0.044	3.633/2.142
253ftest	10011	0 -1 1.250	1.319/0.000	2.059/0.213	0.489	5.626/0.063	2.933/1.520
254ftest	10011	0 -1 0.150	0.219/0.000	0.206/0.006	0.933	1.389/0.026	2.088/1.761
255ftest	10011	0 -1 1.450	1.499/0.000	1.997/0.081	0.889	1.507/0.023	4.167/2.301
256ftest	10011	0 -1 0.650	0.699/0.000	0.961/0.034	0.889	0.149/0.033	2.254/1.565
257ftest	10011	0 -1 1.350	1.417/0.000	1.811/0.073	0.867	1.918/0.045	3.211/1.740
258ftest	10011	0 -1 1.600	1.619/0.000	2.116/0.069	0.867	1.663/0.021	4.211/2.141
259ftest	10011	0 -1 1.550	1.670/0.000	1.895/0.061	0.956	0.000/0.000	2.756/1.023
260ftest	10011	0 -1 0.450	0.530/0.000	0.938/0.107	0.489	2.341/0.045	3.050/2.291
261ftest	10011	0 -1 0.700	0.788/0.000	0.874/0.014	1.000	0.938/0.022	1.352/0.941
262ftest	10011	0 -1 1.550	1.624/0.000	1.963/0.037	0.978	2.858/0.039	4.000/1.930
263ftest	10011	0 -1 1.200	1.248/0.000	1.972/0.339	0.533	5.133/0.134	3.560/2.250
264ftest	10011	0 -1 1.100	1.251/0.000	1.765/0.127	0.667	5.346/0.057	3.189/1.817
265ftest	10011	0 -1 1.400	1.473/0.000	1.776/0.017	1.000	3.990/0.050	0.000/0.000
266ftest	10011	0 -1 1.250	1.340/0.000	1.799/0.103	0.667	2.509/0.033	2.311/0.559
267ftest	10011	0 -1 1.150	1.224/0.000	1.672/0.070	0.778	2.087/0.025	3.278/1.599
268ftest	10011	0 -1 0.000	0.041/0.000	0.209/0.041	0.378	0.502/0.033	0.000/0.000
269ftest	10011	0 -1 1.700	1.693/0.000	2.217/0.054	0.911	4.250/0.049	4.211/2.390
270ftest	10011	0 -1 0.000	0.043/0.000	0.273/0.082	0.222	2.846/0.042	1.913/2.208
271ftest	10011	0 -1 1.100	1.126/0.000	1.358/0.028	1.000	2.622/0.032	2.778/1.817
272ftest	10011	0 -1 0.100	0.099/0.000	0.150/0.007	0.711	1.709/0.024	2.002/1.739
273ftest	10011	0 -1 0.000	0.000/0.000	0.361/0.084	0.222	0.000/0.000	0.000/0.000
274ftest	10011	0 -1 1.500	1.563/0.000	2.079/0.092	0.844	1.725/0.025	3.822/1.936
275ftest	10011	0 -1 1.300	1.336/0.000	1.816/0.051	0.911	2.271/0.047	4.600/3.484
276ftest	10011	0 -1 1.150	1.206/0.000	1.456/0.023	1.000	1.579/0.023	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
277ftest	10011	0 -1 0.900	0.975/0.000	1.449/0.098	0.711	1.327/0.020	0.000/0.000
278ftest	10011	0 -1 1.000	1.003/0.000	1.478/0.076	0.778	1.678/0.018	3.722/2.559
279ftest	10011	0 -1 0.950	1.047/0.000	1.913/0.404	0.444	1.721/0.026	0.000/0.000
280ftest	10011	0 -1 0.000	0.026/0.000	0.072/0.019	0.311	4.265/0.049	2.126/2.186
281ftest	10100	0 -1 0.200	0.213/0.000	0.264/0.001	1.000	4.230/0.051	0.000/0.000
282ftest	10100	0 -1 0.000	0.000/0.000	0.044/0.029	0.222	1.035/0.013	0.000/0.000
283ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	1.047/0.016	0.000/0.000
284ftest	10100	0 -1 0.000	0.026/0.000	0.231/0.061	0.289	1.160/0.018	1.152/1.115
285ftest	10100	0 -1 0.000	0.000/0.000	0.064/0.058	0.133	0.068/0.022	0.000/0.000
286ftest	10100	0 -1 0.000	0.000/0.000	0.121/0.073	0.156	2.508/0.032	0.000/0.000
287ftest	10100	0 -1 0.000	0.000/0.000	0.134/0.080	0.111	3.896/0.045	0.000/0.000
288ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.121/0.011	0.000/0.000
289ftest	10100	0 -1 0.000	0.000/0.000	0.671/0.274	0.178	2.896/0.039	0.000/0.000
290ftest	10100	0 -1 0.000	0.000/0.000	0.112/0.053	0.044	0.000/0.000	0.000/0.000
291ftest	10100	0 -1 0.650	0.746/0.000	1.028/0.139	0.578	4.302/0.049	0.000/0.000
292ftest	10100	0 -1 0.000	0.000/0.000	0.338/0.122	0.044	1.107/0.020	0.000/0.000
293ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.656/0.644
294ftest	10100	0 -1 0.000	0.000/0.000	0.275/0.221	0.044	0.000/0.000	1.392/1.000
295ftest	10100	0 -1 0.000	0.000/0.000	0.410/0.161	0.111	2.978/0.034	0.000/0.000
296ftest	10100	0 -1 0.000	0.049/0.000	0.066/0.014	0.311	1.099/0.027	0.000/0.000
297ftest	10100	0 -1 0.000	0.000/0.000	0.090/0.078	0.089	0.775/0.032	0.000/0.000
298ftest	10100	0 -1 0.000	0.050/0.000	0.607/0.439	0.133	1.339/0.024	0.000/0.000
299ftest	10100	0 -1 0.000	0.039/0.000	0.683/0.207	0.089	1.542/0.021	0.000/0.000
300ftest	10100	0 -1 0.650	0.775/0.000	1.588/0.280	0.400	2.568/0.027	0.000/0.000
301ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.424/0.009	1.072/1.098
302ftest	10100	0 -1 0.700	0.800/0.000	0.872/0.023	0.956	0.000/0.000	1.057/0.339
303ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.429/0.012	0.000/0.000
304ftest	10100	0 -1 0.000	0.061/0.000	0.182/0.067	0.156	1.638/0.020	0.000/0.000
305ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.874/0.018	0.155/0.177
306ftest	10100	0 -1 0.750	0.871/0.000	1.558/0.314	0.511	2.775/0.035	0.000/0.000
307ftest	10100	0 -1 0.750	0.828/0.000	0.933/0.016	1.000	2.511/0.038	1.065/0.079
308ftest	10100	0 -1 0.000	0.000/0.000	0.197/0.032	0.489	1.189/0.025	0.000/0.000
309ftest	10100	0 -1 0.000	0.057/0.000	0.121/0.025	0.333	0.042/0.012	0.000/0.000
310ftest	10100	0 -1 0.000	0.025/0.000	0.315/0.056	0.444	0.000/0.000	0.000/0.000
311ftest	10100	0 -1 0.000	0.043/0.000	0.281/0.064	0.511	0.533/0.046	0.000/0.000
312ftest	10100	0 -1 0.050	0.068/0.000	0.284/0.109	0.267	3.551/0.041	0.000/0.000
313ftest	10100	0 -1 0.750	0.868/0.000	0.959/0.029	0.889	0.474/0.016	1.032/0.166
314ftest	10100	0 -1 0.000	0.000/0.000	0.073/0.041	0.222	0.000/0.000	0.233/0.266
315ftest	10100	0 -1 0.000	0.064/0.000	0.043/0.023	0.111	3.566/0.053	0.000/0.000
316ftest	10100	0 -1 0.600	0.653/0.000	0.769/0.030	0.867	2.435/0.024	0.830/0.064
317ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	1.692/0.027	0.000/0.000
318ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
319ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
320ftest	10100	0 -1 0.700	0.824/0.000	0.889/0.031	1.000	2.116/0.025	0.926/0.090
321ftest	10101	0 -1 0.000	0.053/0.000	1.163/0.449	0.111	1.021/0.013	2.573/1.950
322ftest	10101	0 -1 1.450	1.490/0.000	2.428/0.423	0.511	4.608/0.042	2.144/0.531
323ftest	10101	0 -1 0.000	0.000/0.000	0.313/0.168	0.089	0.000/0.000	0.000/0.000
324ftest	10101	0 -1 0.000	0.000/0.000	1.435/0.600	0.111	0.000/0.000	2.474/2.058
325ftest	10101	0 -1 0.000	0.000/0.000	0.352/0.094	0.311	0.412/0.009	0.000/0.000
326ftest	10101	0 -1 0.000	0.000/0.000	0.027/0.004	0.356	0.000/0.000	1.468/1.412
327ftest	10101	0 -1 0.950	1.026/0.000	1.743/0.253	0.444	3.124/0.030	0.000/0.000
328ftest	10101	0 -1 1.450	1.467/0.000	1.751/0.076	0.867	4.370/0.059	0.000/0.000
329ftest	10101	0 -1 0.000	0.000/0.000	0.110/0.029	0.222	0.109/0.013	0.000/0.000
330ftest	10101	0 -1 0.000	0.000/0.000	0.211/0.114	0.156	0.000/0.000	0.000/0.000
331ftest	10101	0 -1 0.000	0.025/0.000	0.610/0.465	0.044	1.968/0.020	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
332ftest	10101	0 -1 0.000	0.064/0.000	0.188/0.104	0.111	0.358/0.028	0.000/0.000
333ftest	10101	0 -1 0.000	0.000/0.000	0.131/0.026	0.378	2.973/0.043	0.000/0.000
334ftest	10101	0 -1 0.000	0.034/0.000	0.000/0.000	0.089	6.030/0.083	0.000/0.000
335ftest	10101	0 -1 0.000	0.000/0.000	0.255/0.205	0.089	1.127/0.017	0.000/0.000
336ftest	10101	0 -1 0.900	0.936/0.000	1.100/0.035	0.889	5.645/0.071	0.000/0.000
337ftest	10101	0 -1 0.000	0.000/0.000	0.103/0.061	0.133	2.694/0.050	0.000/0.000
338ftest	10101	0 -1 1.100	1.177/0.000	1.382/0.068	0.822	4.983/0.064	1.900/0.933
339ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	1.446/1.427
340ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.123/0.018	0.000/0.000
341ftest	10101	0 -1 0.000	0.041/0.000	0.277/0.118	0.222	1.888/0.036	0.000/0.000
342ftest	10101	0 -1 0.000	0.075/0.000	0.321/0.219	0.067	2.059/0.023	0.000/0.000
343ftest	10101	0 -1 1.650	1.651/0.000	1.904/0.052	0.978	2.965/0.030	0.000/0.000
344ftest	10101	0 -1 1.450	1.481/0.000	1.685/0.025	1.000	2.207/0.028	1.878/0.131
345ftest	10101	0 -1 1.050	1.080/0.000	1.229/0.019	1.000	1.504/0.017	1.350/0.102
346ftest	10101	0 -1 1.400	1.434/0.000	1.652/0.022	1.000	0.914/0.019	0.000/0.000
347ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	1.194/0.015	0.000/0.000
348ftest	10101	0 -1 1.550	1.713/0.000	2.046/0.090	0.778	0.000/0.000	2.422/0.884
349ftest	10101	0 -1 1.500	1.674/0.000	2.174/0.099	0.756	7.048/0.086	2.078/0.210
350ftest	10101	0 -1 0.000	0.079/0.000	0.184/0.041	0.356	1.079/0.039	0.000/0.000
351ftest	10101	0 -1 1.100	1.149/0.000	1.393/0.056	0.844	2.558/0.030	1.467/0.194
352ftest	10101	0 -1 1.000	1.043/0.000	1.157/0.012	1.000	1.765/0.054	1.275/0.083
353ftest	10101	0 -1 0.000	0.039/0.000	0.343/0.074	0.467	4.192/0.048	2.268/2.294
354ftest	10101	0 -1 1.250	1.275/0.000	1.941/0.310	0.578	1.222/0.031	1.700/0.120
355ftest	10101	0 -1 0.000	0.000/0.000	0.036/0.005	0.333	0.000/0.000	1.587/1.608
356ftest	10101	0 -1 0.000	0.000/0.000	0.162/0.042	0.289	0.000/0.000	0.000/0.000
357ftest	10101	0 -1 0.950	1.058/0.000	1.271/0.164	0.600	3.956/0.042	0.000/0.000
358ftest	10101	0 -1 0.900	0.987/0.000	1.047/0.019	0.933	0.000/0.000	0.000/0.000
359ftest	10101	0 -1 0.000	0.000/0.000	0.114/0.054	0.133	2.616/0.050	0.000/0.000
360ftest	10101	0 -1 0.000	0.000/0.000	0.259/0.142	0.089	0.000/0.000	0.000/0.000
361ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
362ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
363ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
364ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
365ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
366ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
367ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
368ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
369ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
370ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
371ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
372ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
373ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
374ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
375ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
376ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
377ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
378ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
379ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
380ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
381ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
382ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
383ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
384ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
385ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
386ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id) PCR	PA	.
387ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
388ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
389ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
390ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
391ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
392ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
393ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
394ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
395ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
396ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
397ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
398ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
399ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	
400ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178 0.000/0.000	0.000/0.000	

Appendix H: Batch 7 Report

Batch 7. 40 instances of each of ten scenarios. January 1998 The Report first lists opinions for Aroclor 1242, then 1254, and 1260. The Aroclor is indicated in the left corner of the title bar. The first column contains the sample identifier. The second column indicates the sample's scenario, in Contamination, None, Single Multiple, and Overconcentration order. The next two columns are obsolete and not titled. The next column contains a single floating point number, which is the Known concentration of the specific Aroclor in the sample. The last five columns are Method opinions, as shown in the title bar. The quantity opinions are presented as two numbers, separated by a "/". The first is the quantity estimate, and the second is the error estimate, if one was provided by the Method. Neural Net for Identity returns a probability between 0 and 1 that the specific Aroclor is present in the sample.

1242	Scenario			Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0	-1	0.250	0.251/0.000	0.374/0.009	0.978	0.415/0.016	1.320/1.363
002ftest	00010	0	-1	0.300	0.323/0.000	0.423/0.008	1.000	0.441/0.011	0.478/0.038
003ftest	00010	0	-1	0.250	0.248/0.000	0.362/0.010	0.978	0.388/0.013	0.427/0.062
004ftest	00010	0	-1	0.100	0.099/0.000	0.148/0.004	0.978	0.174/0.009	0.312/0.251
005ftest	00010	0	-1	0.200	0.197/0.000	0.287/0.011	0.956	0.307/0.009	1.224/1.208
006ftest	00010	0	-1	0.400	0.390/0.000	0.563/0.013	0.978	0.538/0.013	0.635/0.064
007ftest	00010	0	-1	0.350	0.385/0.000	0.490/0.005	1.000	0.498/0.013	2.249/2.175
008ftest	00010	0	-1	0.050	0.051/0.000	0.072/0.003	0.978	0.106/0.009	0.089/0.025
009ftest	00010	0	-1	0.750	0.858/0.000	1.082/0.038	0.956	1.102/0.020	1.717/0.895
010ftest	00010	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	0.057/0.009	0.258/0.395
011ftest	00010	0	-1	0.700	0.789/0.000	0.971/0.019	1.000	1.014/0.017	1.467/0.639
012ftest	00010	0	-1	0.200	0.198/0.000	0.288/0.006	1.000	0.357/0.011	1.107/1.219
013ftest	00010	0	-1	0.450	0.451/0.000	0.645/0.025	0.956	0.652/0.015	1.712/1.563
014ftest	00010	0	-1	0.750	0.864/0.000	1.090/0.036	0.978	1.063/0.019	2.250/1.676
015ftest	00010	0	-1	0.300	0.325/0.000	0.445/0.015	0.956	0.521/0.013	1.047/0.878
016ftest	00010	0	-1	0.250	0.253/0.000	0.363/0.013	0.956	0.371/0.010	1.010/0.945
017ftest	00010	0	-1	0.500	0.502/0.000	0.689/0.012	1.000	0.703/0.014	0.913/0.279
018ftest	00010	0	-1	0.200	0.196/0.000	0.337/0.013	0.911	0.315/0.016	1.442/1.593
019ftest	00010	0	-1	0.150	0.164/0.000	0.218/0.004	1.000	0.244/0.009	0.235/0.015
020ftest	00010	0	-1	0.150	0.162/0.000	0.497/0.141	0.600	0.292/0.015	1.350/1.587
021ftest	00010	0	-1	0.750	0.862/0.000	1.072/0.032	0.978	1.058/0.018	2.000/1.328
022ftest	00010	0	-1	0.750	0.866/0.000	1.064/0.026	0.978	0.987/0.016	2.814/2.164
023ftest	00010	0	-1	0.200	0.198/0.000	0.314/0.014	0.933	0.282/0.012	0.387/0.089
024ftest	00010	0	-1	0.050	0.053/0.000	0.294/0.120	0.422	0.185/0.013	1.230/1.689
025ftest	00010	0	-1	0.200	0.197/0.000	0.277/0.003	0.978	0.278/0.009	1.231/1.203
026ftest	00010	0	-1	0.150	0.162/0.000	0.223/0.006	0.978	0.337/0.014	0.845/0.879
027ftest	00010	0	-1	0.500	0.502/0.000	0.699/0.016	0.978	0.722/0.015	1.080/0.526
028ftest	00010	0	-1	0.850	0.848/0.000	1.072/0.021	1.000	1.028/0.015	1.283/0.254
029ftest	00010	0	-1	0.250	0.253/0.000	0.359/0.011	0.978	0.381/0.010	0.912/0.808
030ftest	00010	0	-1	0.850	0.850/0.000	1.087/0.020	1.000	0.992/0.017	1.133/0.047
031ftest	00010	0	-1	0.000	0.000/0.000	0.110/0.057	0.178	0.048/0.013	0.636/0.925
032ftest	00010	0	-1	0.800	0.783/0.000	1.057/0.028	0.978	1.000/0.019	1.683/0.901
033ftest	00010	0	-1	0.350	0.384/0.000	0.492/0.007	1.000	0.488/0.010	1.039/0.670
034ftest	00010	0	-1	0.000	0.000/0.000	0.217/0.108	0.178	0.115/0.015	1.175/1.696
035ftest	00010	0	-1	0.550	0.566/0.000	0.807/0.032	0.956	0.843/0.016	1.938/1.683
036ftest	00010	0	-1	0.700	0.794/0.000	0.982/0.025	1.000	0.987/0.015	1.750/1.072
037ftest	00010	0	-1	0.900	0.907/0.000	1.142/0.019	1.000	1.086/0.014	1.971/1.017
038ftest	00010	0	-1	0.400	0.394/0.000	0.567/0.016	0.978	0.561/0.013	1.075/0.725
039ftest	00010	0	-1	0.000	0.000/0.000	0.193/0.101	0.200	0.065/0.012	1.099/1.635

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
040ftest	00010	0 -1	0.550	0.567/0.000	0.773/0.019	0.978	0.786/0.014
041ftest	00011	0 -1	1.250	1.284/0.000	1.753/0.053	1.000	1.512/0.023
042ftest	00011	0 -1	1.100	1.137/0.000	1.501/0.055	0.956	1.442/0.024
043ftest	00011	0 -1	1.250	1.287/0.000	1.772/0.044	0.978	1.512/0.022
044ftest	00011	0 -1	1.350	1.414/0.000	1.800/0.041	1.000	1.644/0.025
045ftest	00011	0 -1	1.000	1.009/0.000	1.395/0.061	0.933	1.407/0.035
046ftest	00011	0 -1	1.100	1.142/0.000	1.543/0.060	0.956	1.522/0.037
047ftest	00011	0 -1	1.050	1.077/0.000	1.366/0.033	1.000	1.263/0.018
048ftest	00011	0 -1	1.300	1.339/0.000	1.698/0.029	1.000	1.625/0.026
049ftest	00011	0 -1	1.000	1.011/0.000	1.410/0.060	0.933	1.342/0.034
050ftest	00011	0 -1	1.000	1.012/0.000	1.422/0.064	0.933	1.344/0.033
051ftest	00011	0 -1	1.500	1.572/0.000	2.006/0.049	1.000	1.892/0.025
052ftest	00011	0 -1	1.650	1.635/0.000	2.144/0.056	1.000	1.932/0.030
053ftest	00011	0 -1	1.300	1.341/0.000	1.733/0.045	1.000	1.624/0.023
054ftest	00011	0 -1	1.400	1.448/0.000	1.976/0.072	0.956	1.818/0.037
055ftest	00011	0 -1	0.650	0.732/0.000	0.957/0.019	1.000	1.046/0.032
056ftest	00011	0 -1	1.100	1.140/0.000	1.549/0.066	0.933	1.530/0.036
057ftest	00011	0 -1	1.150	1.210/0.000	1.526/0.032	1.000	1.479/0.024
058ftest	00011	0 -1	1.250	1.285/0.000	1.632/0.032	1.000	1.551/0.025
059ftest	00011	0 -1	1.700	1.682/0.000	2.196/0.067	1.000	2.065/0.030
060ftest	00011	0 -1	0.000	0.000/0.000	0.434/0.198	0.133	0.154/0.026
061ftest	00011	0 -1	0.800	0.781/0.000	1.062/0.022	1.000	1.025/0.024
062ftest	00011	0 -1	1.350	1.415/0.000	1.785/0.037	1.000	1.637/0.023
063ftest	00011	0 -1	1.550	1.645/0.000	2.161/0.078	0.978	2.036/0.037
064ftest	00011	0 -1	1.650	1.635/0.000	2.131/0.053	1.000	1.938/0.029
065ftest	00011	0 -1	0.350	0.384/0.000	0.568/0.012	1.000	0.636/0.030
066ftest	00011	0 -1	1.000	1.014/0.000	1.318/0.036	0.978	1.221/0.020
067ftest	00011	0 -1	1.400	1.450/0.000	2.000/0.079	0.956	1.817/0.040
068ftest	00011	0 -1	1.700	1.688/0.000	2.237/0.064	1.000	2.047/0.032
069ftest	00011	0 -1	0.000	0.000/0.000	0.333/0.154	0.133	0.123/0.019
070ftest	00011	0 -1	0.900	0.910/0.000	1.226/0.025	1.000	1.217/0.034
071ftest	00011	0 -1	0.550	0.566/0.000	0.803/0.025	0.956	0.809/0.021
072ftest	00011	0 -1	1.550	1.648/0.000	2.121/0.068	1.000	1.971/0.029
073ftest	00011	0 -1	0.200	0.198/0.000	0.749/0.245	0.444	0.452/0.029
074ftest	00011	0 -1	1.200	1.218/0.000	1.591/0.040	1.000	1.552/0.026
075ftest	00011	0 -1	1.200	1.222/0.000	1.668/0.055	0.956	1.537/0.034
076ftest	00011	0 -1	1.600	1.570/0.000	2.179/0.082	0.956	1.929/0.037
077ftest	00011	0 -1	0.000	0.000/0.000	0.409/0.179	0.178	0.212/0.023
078ftest	00011	0 -1	0.950	0.972/0.000	1.254/0.029	1.000	1.184/0.024
079ftest	00011	0 -1	1.550	1.646/0.000	2.032/0.039	1.000	1.902/0.023
080ftest	00011	0 -1	1.000	1.011/0.000	1.379/0.050	0.956	1.336/0.031
081ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000
082ftest	00100	0 -1	0.000	0.000/0.000	0.028/0.016	0.222	0.041/0.012
083ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.031/0.010
084ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.200	0.038/0.012
085ftest	00100	0 -1	0.600	0.599/0.000	0.798/0.009	1.000	0.751/0.011
086ftest	00100	0 -1	0.850	0.849/0.000	1.055/0.016	1.000	0.961/0.013
087ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.200	0.036/0.010
088ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.035/0.009
089ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000
090ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000
091ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000
092ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.222	0.031/0.010
093ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.035/0.009
094ftest	00100	0 -1	0.000	0.000/0.000	0.030/0.015	0.244	0.041/0.012

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
095ftest	00100	0 -1 0.000	0.000/0.000	0.028/0.011	0.244	0.049/0.010	0.000/0.000
096ftest	00100	0 -1 0.000	0.000/0.000	0.028/0.011	0.244	0.049/0.010	0.000/0.000
097ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.036/0.010	1.474/1.890
098ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.058/0.010	1.622/2.095
099ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.036/0.010	1.474/1.890
100ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.031/0.009	0.000/0.000
101ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
102ftest	00100	0 -1 0.200	0.196/0.000	0.267/0.001	1.000	0.247/0.009	0.282/0.007
103ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
104ftest	00100	0 -1 0.000	0.000/0.000	0.031/0.027	0.156	0.032/0.009	0.000/0.000
105ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
106ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.054/0.012	0.000/0.000
107ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.054/0.011	0.000/0.000
108ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.047/0.009	0.000/0.000
109ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
110ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.029/0.009	0.000/0.000
111ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.622	0.039/0.009	1.086/1.392
112ftest	00100	0 -1 0.500	0.504/0.000	0.669/0.007	1.000	0.641/0.010	0.714/0.019
113ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
114ftest	00100	0 -1 0.100	0.098/0.000	0.140/0.001	1.000	0.134/0.009	0.143/0.005
115ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.059/0.010	1.368/1.766
116ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
117ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.733	0.000/0.000	0.000/0.000
118ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.289	0.000/0.000	0.000/0.000
119ftest	00100	0 -1 0.050	0.049/0.000	0.069/0.001	1.000	0.068/0.009	0.066/0.000
120ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.031/0.010	0.000/0.000
121ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.091/0.016	0.000/0.000
122ftest	00101	0 -1 1.700	1.686/0.000	2.124/0.037	1.000	1.974/0.022	2.220/0.040
123ftest	00101	0 -1 1.000	1.012/0.000	1.260/0.020	1.000	1.161/0.014	1.300/0.000
124ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.084/0.018	0.000/0.000
125ftest	00101	0 -1 1.650	1.634/0.000	2.054/0.037	1.000	1.850/0.021	2.160/0.049
126ftest	00101	0 -1 0.000	0.000/0.000	0.047/0.025	0.244	0.072/0.016	3.236/4.122
127ftest	00101	0 -1 1.150	1.207/0.000	1.473/0.022	1.000	1.361/0.016	1.529/0.070
128ftest	00101	0 -1 1.150	1.207/0.000	1.473/0.022	1.000	1.361/0.016	1.529/0.070
129ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.064/0.017	0.000/0.000
130ftest	00101	0 -1 0.000	0.000/0.000	0.060/0.028	0.244	0.099/0.018	3.612/4.553
131ftest	00101	0 -1 1.100	1.136/0.000	1.402/0.021	1.000	1.323/0.016	1.500/0.000
132ftest	00101	0 -1 1.400	1.446/0.000	1.790/0.027	1.000	1.662/0.019	1.900/0.001
133ftest	00101	0 -1 0.900	0.906/0.000	1.130/0.018	1.000	1.053/0.013	1.200/0.000
134ftest	00101	0 -1 0.000	0.000/0.000	0.076/0.010	0.578	0.085/0.017	3.313/4.184
135ftest	00101	0 -1 1.300	1.339/0.000	1.660/0.025	1.000	1.560/0.018	1.760/0.049
136ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.533	0.043/0.014	0.000/0.000
137ftest	00101	0 -1 1.600	1.570/0.000	2.021/0.041	1.000	1.777/0.020	2.100/0.000
138ftest	00101	0 -1 0.000	0.000/0.000	0.041/0.029	0.200	0.046/0.018	3.557/4.521
139ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.084/0.018	0.000/0.000
140ftest	00101	0 -1 1.550	1.644/0.000	2.022/0.042	1.000	1.851/0.021	2.140/0.049
141ftest	00101	0 -1 0.900	0.906/0.000	1.130/0.018	1.000	1.053/0.013	1.200/0.000
142ftest	00101	0 -1 0.900	0.906/0.000	1.130/0.018	1.000	1.053/0.013	1.200/0.000
143ftest	00101	0 -1 0.000	0.000/0.000	0.079/0.009	0.622	0.078/0.019	3.826/4.858
144ftest	00101	0 -1 1.150	1.207/0.000	1.473/0.022	1.000	1.361/0.016	1.529/0.070
145ftest	00101	0 -1 0.000	0.000/0.000	0.076/0.010	0.578	0.085/0.017	3.313/4.184
146ftest	00101	0 -1 1.400	1.446/0.000	1.790/0.027	1.000	1.662/0.019	1.900/0.001
147ftest	00101	0 -1 0.000	0.000/0.000	0.085/0.010	0.622	0.088/0.016	3.062/3.825
148ftest	00101	0 -1 1.500	1.569/0.000	1.932/0.029	1.000	1.826/0.021	2.040/0.049
149ftest	00101	0 -1 0.000	0.000/0.000	0.036/0.017	0.244	0.062/0.012	2.171/2.750

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
150ftest	00101	0 -1 0.000	0.000/0.000	0.030/0.011	0.267	0.070/0.020	0.000/0.000
151ftest	00101	0 -1 1.100	1.136/0.000	1.402/0.021	1.000	1.323/0.016	1.500/0.000
152ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.311	0.074/0.015	0.000/0.000
153ftest	00101	0 -1 0.000	0.000/0.000	0.032/0.018	0.244	0.041/0.013	2.263/2.876
154ftest	00101	0 -1 0.000	0.000/0.000	0.089/0.010	0.689	0.092/0.017	3.536/4.490
155ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.042/0.015	0.000/0.000
156ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.533	0.043/0.014	0.000/0.000
157ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.116/0.020	0.000/0.000
158ftest	00101	0 -1 0.000	0.000/0.000	0.085/0.010	0.622	0.088/0.016	3.062/3.825
159ftest	00101	0 -1 0.000	0.000/0.000	0.041/0.029	0.200	0.046/0.018	3.557/4.521
160ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.073/0.015	0.000/0.000
161ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
162ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
163ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
164ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
165ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
166ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
167ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
168ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
169ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
170ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
171ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
172ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
173ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
174ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
175ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
176ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
177ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
178ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
179ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
180ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
181ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
182ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
183ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
184ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
185ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
186ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
187ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
188ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
189ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
190ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
191ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
192ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
193ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
194ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
195ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
196ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
197ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
198ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
199ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
200ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
201ftest	10010	0 -1 0.000	0.000/0.000	0.046/0.021	0.311	0.090/0.012	0.204/0.313
202ftest	10010	0 -1 0.800	0.855/0.000	1.467/0.083	0.844	0.000/0.000	2.433/1.682
203ftest	10010	0 -1 0.400	0.439/0.000	1.342/0.407	0.511	0.000/0.000	2.327/2.046
204ftest	10010	0 -1 0.450	0.515/0.000	2.106/0.904	0.311	0.000/0.000	0.956/0.341

1242	Scenario	Known			MLR	N-NET	N-NET(id)	PCR	PA
205ftest	10010	0	-1	0.000	0.074/0.000	0.404/0.249	0.178	0.000/0.000	1.779/2.129
206ftest	10010	0	-1	0.100	0.101/0.000	0.373/0.124	0.444	0.000/0.000	1.195/1.470
207ftest	10010	0	-1	0.050	0.055/0.000	0.325/0.137	0.333	0.000/0.000	1.446/2.187
208ftest	10010	0	-1	0.100	0.160/0.000	0.183/0.013	0.822	1.322/0.022	0.767/0.772
209ftest	10010	0	-1	0.700	0.861/0.000	1.274/0.213	0.644	0.456/0.016	1.950/1.072
210ftest	10010	0	-1	0.300	0.358/0.000	0.444/0.016	0.933	0.665/0.013	0.617/0.225
211ftest	10010	0	-1	0.550	0.681/0.000	0.744/0.012	1.000	0.000/0.000	1.392/0.883
212ftest	10010	0	-1	0.600	0.763/0.000	3.664/1.194	0.222	4.083/0.050	0.000/0.000
213ftest	10010	0	-1	0.700	0.798/0.000	1.272/0.056	0.889	0.000/0.000	1.567/0.579
214ftest	10010	0	-1	0.350	0.429/0.000	0.753/0.035	0.867	0.000/0.000	1.603/1.099
215ftest	10010	0	-1	0.250	0.279/0.000	0.328/0.017	0.867	0.665/0.018	1.282/1.198
216ftest	10010	0	-1	0.250	0.292/0.000	1.126/0.506	0.622	0.000/0.000	1.389/1.351
217ftest	10010	0	-1	0.650	0.747/0.000	0.936/0.032	0.956	0.929/0.021	2.042/1.591
218ftest	10010	0	-1	0.750	0.869/0.000	1.098/0.041	0.956	1.238/0.020	2.117/1.469
219ftest	10010	0	-1	0.550	0.573/0.000	0.775/0.021	0.978	1.229/0.015	1.533/1.082
220ftest	10010	0	-1	0.650	0.797/0.000	1.635/0.449	0.667	2.461/0.031	1.603/0.714
221ftest	10010	0	-1	0.850	0.865/0.000	2.471/0.685	0.511	2.008/0.029	3.771/3.217
222ftest	10010	0	-1	0.550	0.740/0.000	1.357/0.268	0.511	1.914/0.037	0.000/0.000
223ftest	10010	0	-1	0.250	0.288/0.000	0.347/0.008	0.978	0.172/0.023	0.367/0.020
224ftest	10010	0	-1	0.350	0.403/0.000	0.533/0.022	0.956	0.103/0.031	1.395/1.241
225ftest	10010	0	-1	0.850	0.993/0.000	1.097/0.014	1.000	2.216/0.031	2.283/1.070
226ftest	10010	0	-1	0.650	0.736/0.000	0.919/0.026	0.978	0.894/0.016	1.672/1.104
227ftest	10010	0	-1	0.000	0.051/0.000	1.733/0.602	0.089	0.197/0.035	0.000/0.000
228ftest	10010	0	-1	0.000	0.034/0.000	0.242/0.083	0.267	0.457/0.017	0.000/0.000
229ftest	10010	0	-1	0.650	0.805/0.000	3.119/0.950	0.289	1.785/0.032	2.403/1.815
230ftest	10010	0	-1	0.050	0.063/0.000	0.648/0.439	0.644	0.950/0.014	0.074/0.008
231ftest	10010	0	-1	0.550	0.714/0.000	1.081/0.182	0.667	1.786/0.030	0.000/0.000
232ftest	10010	0	-1	0.100	0.118/0.000	2.631/1.133	0.244	1.470/0.032	0.768/1.015
233ftest	10010	0	-1	0.650	0.831/0.000	1.027/0.040	0.911	0.855/0.070	1.462/0.705
234ftest	10010	0	-1	0.100	0.182/0.000	0.341/0.102	0.422	1.581/0.047	0.000/0.000
235ftest	10010	0	-1	0.300	0.422/0.000	0.690/0.208	0.422	1.459/0.023	1.967/1.787
236ftest	10010	0	-1	0.000	0.134/0.000	1.071/0.806	0.133	2.685/0.048	0.574/0.702
237ftest	10010	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	0.269/0.010	0.083/0.130
238ftest	10010	0	-1	0.600	0.691/0.000	1.139/0.064	0.911	2.200/0.031	1.912/1.272
239ftest	10010	0	-1	0.300	0.377/0.000	1.490/0.342	0.467	1.225/0.021	0.000/0.000
240ftest	10010	0	-1	0.000	0.080/0.000	1.622/0.664	0.089	2.143/0.048	1.696/2.172
241ftest	10011	0	-1	1.450	1.535/0.000	1.951/0.032	1.000	1.360/0.030	3.967/2.859
242ftest	10011	0	-1	1.050	1.091/0.000	1.593/0.042	0.978	1.443/0.021	4.029/3.140
243ftest	10011	0	-1	1.000	1.021/0.000	1.407/0.052	0.956	1.607/0.029	3.067/2.344
244ftest	10011	0	-1	0.000	0.036/0.000	1.498/0.660	0.267	0.000/0.000	0.000/0.000
245ftest	10011	0	-1	1.650	1.657/0.000	2.136/0.022	1.000	2.811/0.039	5.186/3.760
246ftest	10011	0	-1	0.000	0.000/0.000	0.469/0.229	0.156	0.000/0.000	2.355/3.324
247ftest	10011	0	-1	1.150	1.220/0.000	1.688/0.044	1.000	0.206/0.015	2.667/1.291
248ftest	10011	0	-1	1.450	1.543/0.000	2.489/0.300	0.622	2.419/0.043	2.067/0.075
249ftest	10011	0	-1	1.150	1.297/0.000	2.240/0.138	0.800	5.098/0.091	3.433/1.586
250ftest	10011	0	-1	0.700	0.855/0.000	3.422/0.924	0.111	0.745/0.032	3.300/3.185
251ftest	10011	0	-1	1.700	1.823/0.000	2.850/0.159	0.822	3.357/0.056	3.683/1.667
252ftest	10011	0	-1	1.400	1.440/0.000	1.861/0.044	1.000	1.780/0.029	2.017/0.107
253ftest	10011	0	-1	1.100	1.141/0.000	1.520/0.055	0.956	1.547/0.042	3.417/2.740
254ftest	10011	0	-1	0.000	0.136/0.000	1.448/0.502	0.156	1.416/0.044	2.355/2.946
255ftest	10011	0	-1	0.000	0.046/0.000	1.362/0.418	0.156	0.000/0.000	2.547/3.887
256ftest	10011	0	-1	0.000	0.053/0.000	0.757/0.358	0.156	0.229/0.024	3.252/4.313
257ftest	10011	0	-1	1.350	1.434/0.000	1.900/0.063	0.978	2.384/0.046	3.567/2.436
258ftest	10011	0	-1	1.250	1.292/0.000	2.035/0.099	0.956	1.590/0.033	3.533/2.488
259ftest	10011	0	-1	1.000	1.070/0.000	2.364/0.641	0.578	0.430/0.053	1.971/0.552

1242	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
260ftest	10011	0 -1 0.000	0.000/0.000	0.649/0.310	0.089	0.666/0.029	1.628/2.385
261ftest	10011	0 -1 1.200	1.274/0.000	1.560/0.038	0.978	2.665/0.030	1.750/0.275
262ftest	10011	0 -1 1.150	1.215/0.000	1.616/0.048	0.956	3.362/0.039	3.567/2.427
263ftest	10011	0 -1 0.000	0.048/0.000	0.894/0.308	0.244	0.000/0.000	0.000/0.000
264ftest	10011	0 -1 1.700	1.747/0.000	2.596/0.343	0.622	0.903/0.053	4.283/2.361
265ftest	10011	0 -1 1.600	1.628/0.000	3.689/0.850	0.422	3.970/0.059	4.717/2.121
266ftest	10011	0 -1 0.900	0.937/0.000	1.187/0.027	1.000	2.441/0.039	2.900/2.136
267ftest	10011	0 -1 1.500	1.620/0.000	2.498/0.351	0.578	0.000/0.000	4.783/3.169
268ftest	10011	0 -1 1.600	1.592/0.000	2.395/0.111	0.933	1.208/0.035	3.514/1.696
269ftest	10011	0 -1 0.000	0.038/0.000	0.560/0.135	0.444	0.207/0.036	0.000/0.000
270ftest	10011	0 -1 0.000	0.071/0.000	0.771/0.290	0.222	0.887/0.046	5.405/7.090
271ftest	10011	0 -1 1.000	1.046/0.000	1.417/0.057	0.978	3.703/0.058	3.150/2.536
272ftest	10011	0 -1 0.000	0.045/0.000	0.564/0.222	0.200	1.486/0.038	2.432/3.214
273ftest	10011	0 -1 1.500	1.562/0.000	2.439/0.119	0.956	0.553/0.032	4.067/2.709
274ftest	10011	0 -1 0.350	0.459/0.000	0.617/0.028	0.911	0.800/0.025	2.835/3.341
275ftest	10011	0 -1 1.150	1.251/0.000	2.005/0.105	0.844	2.336/0.035	2.000/0.404
276ftest	10011	0 -1 1.500	1.565/0.000	2.373/0.099	0.956	2.361/0.038	4.067/2.709
277ftest	10011	0 -1 0.200	0.268/0.000	0.690/0.197	0.444	0.672/0.034	2.307/2.341
278ftest	10011	0 -1 1.300	1.377/0.000	1.787/0.050	0.978	2.831/0.054	4.183/3.194
279ftest	10011	0 -1 1.550	1.707/0.000	2.622/0.115	0.911	1.632/0.028	3.767/1.775
280ftest	10011	0 -1 1.250	1.415/0.000	2.548/0.617	0.533	1.493/0.033	3.283/1.987
281ftest	10100	0 -1 0.000	0.044/0.000	1.354/0.664	0.133	2.203/0.036	0.000/0.000
282ftest	10100	0 -1 0.100	0.151/0.000	0.552/0.223	0.511	0.116/0.015	0.000/0.000
283ftest	10100	0 -1 0.550	0.568/0.000	0.751/0.026	0.978	1.339/0.035	0.767/0.039
284ftest	10100	0 -1 0.000	0.063/0.000	0.561/0.482	0.089	0.000/0.000	0.000/0.000
285ftest	10100	0 -1 0.000	0.042/0.000	1.640/0.644	0.133	0.000/0.000	0.000/0.000
286ftest	10100	0 -1 0.000	0.000/0.000	1.248/0.699	0.089	0.000/0.000	0.000/0.000
287ftest	10100	0 -1 0.000	0.000/0.000	0.122/0.071	0.200	0.000/0.000	0.000/0.000
288ftest	10100	0 -1 0.250	0.244/0.000	0.337/0.002	1.000	0.052/0.014	0.362/0.016
289ftest	10100	0 -1 0.050	0.126/0.000	0.286/0.119	0.578	0.000/0.000	0.065/0.001
290ftest	10100	0 -1 0.000	0.000/0.000	0.435/0.307	0.133	0.000/0.000	0.946/1.217
291ftest	10100	0 -1 0.250	0.287/0.000	0.336/0.002	1.000	0.173/0.041	0.357/0.025
292ftest	10100	0 -1 0.000	0.156/0.000	1.467/0.694	0.089	1.417/0.021	2.077/2.144
293ftest	10100	0 -1 0.250	0.328/0.000	1.883/0.977	0.422	2.563/0.044	0.358/0.013
294ftest	10100	0 -1 0.000	0.074/0.000	0.741/0.363	0.156	0.633/0.021	0.000/0.000
295ftest	10100	0 -1 0.000	0.084/0.000	1.692/0.942	0.111	0.000/0.000	1.910/2.279
296ftest	10100	0 -1 0.100	0.172/0.000	0.867/0.458	0.378	1.427/0.023	0.000/0.000
297ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
298ftest	10100	0 -1 0.000	0.032/0.000	0.136/0.094	0.156	0.471/0.024	0.000/0.000
299ftest	10100	0 -1 0.350	0.470/0.000	1.450/0.424	0.311	1.343/0.017	0.000/0.000
300ftest	10100	0 -1 0.000	0.053/0.000	1.013/0.522	0.156	0.000/0.000	0.000/0.000
301ftest	10100	0 -1 0.000	0.000/0.000	0.281/0.253	0.133	0.955/0.031	1.086/1.392
302ftest	10100	0 -1 0.000	0.071/0.000	0.292/0.172	0.222	0.904/0.036	0.000/0.000
303ftest	10100	0 -1 0.000	0.078/0.000	1.181/0.454	0.133	1.610/0.025	0.000/0.000
304ftest	10100	0 -1 0.600	0.759/0.000	2.218/0.555	0.289	1.255/0.044	0.000/0.000
305ftest	10100	0 -1 0.750	0.906/0.000	1.054/0.025	1.000	3.619/0.049	1.067/0.047
306ftest	10100	0 -1 0.000	0.043/0.000	0.317/0.127	0.222	0.456/0.018	0.000/0.000
307ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
308ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	1.165/0.025	0.000/0.000
309ftest	10100	0 -1 0.000	0.000/0.000	0.113/0.104	0.200	0.298/0.028	0.000/0.000
310ftest	10100	0 -1 0.000	0.056/0.000	0.123/0.115	0.222	0.481/0.010	0.000/0.000
311ftest	10100	0 -1 0.000	0.000/0.000	2.320/1.128	0.178	0.416/0.041	1.615/1.698
312ftest	10100	0 -1 0.000	0.056/0.000	0.186/0.151	0.222	0.000/0.000	0.000/0.000
313ftest	10100	0 -1 0.000	0.091/0.000	0.886/0.442	0.200	0.903/0.031	0.000/0.000
314ftest	10100	0 -1 0.000	0.048/0.000	0.715/0.421	0.089	0.000/0.000	0.000/0.000

1242	Scenario	Known		MLR	N-NET	N-NET(id)	PCR	PA
315ftest	10100	0	-1	0.000	0.000/0.000	0.157/0.101	0.200	0.000/0.000
316ftest	10100	0	-1	0.000	0.067/0.000	1.421/0.475	0.111	0.000/0.000
317ftest	10100	0	-1	0.000	0.046/0.000	1.010/0.330	0.222	0.000/0.000
318ftest	10100	0	-1	0.000	0.000/0.000	0.066/0.027	0.244	0.743/0.021
319ftest	10100	0	-1	0.800	0.856/0.000	1.169/0.061	0.889	1.103/0.063
320ftest	10100	0	-1	0.750	0.971/0.000	1.633/0.539	0.467	0.923/0.035
321ftest	10101	0	-1	0.000	0.000/0.000	0.408/0.315	0.178	0.466/0.020
322ftest	10101	0	-1	0.000	0.070/0.000	1.308/0.508	0.133	0.478/0.063
323ftest	10101	0	-1	1.300	1.339/0.000	1.660/0.025	1.000	1.561/0.018
324ftest	10101	0	-1	0.000	0.080/0.000	0.989/0.281	0.267	0.161/0.014
325ftest	10101	0	-1	1.000	1.020/0.000	1.252/0.018	1.000	0.000/0.000
326ftest	10101	0	-1	1.250	1.340/0.000	2.641/0.641	0.600	4.433/0.067
327ftest	10101	0	-1	1.500	1.566/0.000	1.932/0.029	1.000	1.849/0.022
328ftest	10101	0	-1	1.300	1.372/0.000	2.603/0.617	0.533	0.703/0.016
329ftest	10101	0	-1	0.000	0.036/0.000	1.202/0.610	0.178	1.817/0.047
330ftest	10101	0	-1	1.500	1.600/0.000	2.759/0.466	0.600	0.409/0.015
331ftest	10101	0	-1	0.000	0.000/0.000	0.116/0.088	0.089	0.121/0.015
332ftest	10101	0	-1	1.450	1.571/0.000	4.131/1.283	0.444	3.307/0.053
333ftest	10101	0	-1	1.050	1.083/0.000	1.329/0.021	1.000	1.220/0.015
334ftest	10101	0	-1	0.000	0.057/0.000	0.414/0.158	0.222	0.000/0.000
335ftest	10101	0	-1	1.600	1.584/0.000	2.021/0.041	1.000	1.752/0.020
336ftest	10101	0	-1	0.000	0.000/0.000	0.346/0.259	0.089	0.000/0.000
337ftest	10101	0	-1	1.400	1.482/0.000	1.847/0.048	1.000	1.077/0.063
338ftest	10101	0	-1	0.000	0.000/0.000	0.000/0.000	0.222	0.121/0.013
339ftest	10101	0	-1	1.200	1.225/0.000	1.524/0.024	1.000	1.420/0.018
340ftest	10101	0	-1	0.000	0.100/0.000	0.098/0.070	0.267	1.946/0.043
341ftest	10101	0	-1	0.000	0.000/0.000	0.671/0.468	0.222	0.969/0.020
342ftest	10101	0	-1	0.000	0.038/0.000	1.595/1.017	0.156	0.775/0.042
343ftest	10101	0	-1	0.000	0.000/0.000	0.076/0.010	0.578	0.047/0.018
344ftest	10101	0	-1	0.900	0.960/0.000	1.169/0.041	0.933	1.629/0.030
345ftest	10101	0	-1	0.000	0.000/0.000	0.492/0.374	0.222	1.598/0.037
346ftest	10101	0	-1	0.000	0.051/0.000	0.895/0.420	0.178	2.143/0.031
347ftest	10101	0	-1	1.600	1.616/0.000	3.052/0.643	0.533	3.307/0.060
348ftest	10101	0	-1	0.000	0.046/0.000	3.050/1.735	0.067	2.195/0.048
349ftest	10101	0	-1	1.400	1.517/0.000	3.710/1.007	0.533	2.163/0.036
350ftest	10101	0	-1	0.000	0.025/0.000	1.682/0.817	0.133	1.551/0.024
351ftest	10101	0	-1	0.000	0.000/0.000	0.000/0.000	0.133	0.191/0.013
352ftest	10101	0	-1	0.000	0.000/0.000	0.422/0.245	0.133	0.000/0.000
353ftest	10101	0	-1	0.000	0.000/0.000	0.806/0.525	0.178	1.219/0.042
354ftest	10101	0	-1	1.550	1.779/0.000	2.040/0.040	1.000	2.668/0.038
355ftest	10101	0	-1	0.000	0.000/0.000	0.062/0.030	0.222	0.073/0.018
356ftest	10101	0	-1	0.000	0.034/0.000	0.717/0.355	0.200	2.245/0.040
357ftest	10101	0	-1	0.000	0.000/0.000	0.365/0.206	0.200	0.000/0.000
358ftest	10101	0	-1	0.000	0.000/0.000	0.048/0.030	0.200	0.000/0.000
359ftest	10101	0	-1	0.950	0.975/0.000	1.201/0.019	1.000	1.160/0.014
360ftest	10101	0	-1	1.000	1.017/0.000	1.256/0.020	1.000	1.199/0.025
361ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
362ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
363ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
364ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
365ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
366ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
367ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
368ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000
369ftest	11000	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000

[illegible]

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0 -1 0.600	0.677/0.000	0.606/0.041	0.800	0.436/0.017	1.665/0.524
002ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.378	0.000/0.000	0.000/0.000
003ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000	0.000/0.000
004ftest	00010	0 -1 0.100	0.099/0.000	0.115/0.007	0.689	0.034/0.010	0.301/0.080
005ftest	00010	0 -1 0.350	0.394/0.000	0.455/0.006	1.000	0.296/0.010	0.658/0.141
006ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.267	0.000/0.000	0.000/0.000
007ftest	00010	0 -1 0.800	0.786/0.000	0.989/0.017	1.000	0.729/0.014	1.244/0.250
008ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000	0.000/0.000
009ftest	00010	0 -1 0.350	0.404/0.000	0.451/0.032	0.689	0.048/0.021	1.616/0.554
010ftest	00010	0 -1 0.150	0.163/0.000	0.188/0.011	0.800	0.057/0.010	0.338/0.127
011ftest	00010	0 -1 0.250	0.260/0.000	0.279/0.019	0.733	0.000/0.000	1.308/0.472
012ftest	00010	0 -1 0.550	0.576/0.000	0.594/0.027	0.844	0.421/0.012	1.156/0.215
013ftest	00010	0 -1 0.700	0.804/0.000	0.751/0.051	0.800	0.521/0.016	1.600/0.294
014ftest	00010	0 -1 0.850	0.856/0.000	0.844/0.054	0.756	0.585/0.021	1.922/0.418
015ftest	00010	0 -1 0.350	0.392/0.000	0.424/0.029	0.711	0.134/0.015	1.270/0.478
016ftest	00010	0 -1 0.450	0.455/0.000	0.547/0.004	1.000	0.396/0.011	0.791/0.180
017ftest	00010	0 -1 0.100	0.107/0.000	0.105/0.008	0.667	0.000/0.000	0.000/0.000
018ftest	00010	0 -1 0.800	0.801/0.000	0.786/0.056	0.800	0.662/0.018	1.830/0.527
019ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
020ftest	00010	0 -1 0.800	0.804/0.000	0.798/0.050	0.822	0.643/0.016	1.825/0.346
021ftest	00010	0 -1 0.600	0.669/0.000	0.685/0.030	0.956	0.363/0.020	1.700/0.440
022ftest	00010	0 -1 0.800	0.777/0.000	0.915/0.013	1.000	0.722/0.018	1.489/0.479
023ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.000/0.000
024ftest	00010	0 -1 0.750	0.867/0.000	0.814/0.061	0.800	0.570/0.014	1.430/0.257
025ftest	00010	0 -1 0.400	0.397/0.000	0.522/0.008	1.000	0.382/0.010	0.676/0.144
026ftest	00010	0 -1 0.350	0.407/0.000	0.409/0.020	0.822	0.120/0.015	1.111/0.381
027ftest	00010	0 -1 0.200	0.208/0.000	0.210/0.011	0.778	0.000/0.000	1.300/0.355
028ftest	00010	0 -1 0.100	0.106/0.000	0.163/0.011	0.644	0.000/0.000	0.929/0.402
029ftest	00010	0 -1 0.350	0.394/0.000	0.455/0.006	1.000	0.290/0.010	0.697/0.180
030ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
031ftest	00010	0 -1 0.400	0.405/0.000	0.374/0.029	0.667	0.316/0.014	0.919/0.407
032ftest	00010	0 -1 0.350	0.405/0.000	0.365/0.016	0.889	0.098/0.021	1.606/0.556
033ftest	00010	0 -1 0.200	0.192/0.000	0.257/0.003	1.000	0.152/0.011	0.511/0.221
034ftest	00010	0 -1 0.800	0.814/0.000	0.747/0.046	0.822	0.538/0.017	1.478/0.452
035ftest	00010	0 -1 0.750	0.867/0.000	0.856/0.043	0.822	0.520/0.018	1.733/0.327
036ftest	00010	0 -1 0.500	0.506/0.000	0.537/0.033	0.800	0.371/0.016	1.269/0.403
037ftest	00010	0 -1 0.300	0.334/0.000	0.395/0.005	1.000	0.248/0.016	0.960/0.499
038ftest	00010	0 -1 0.300	0.335/0.000	0.343/0.017	0.844	0.133/0.014	1.227/0.250
039ftest	00010	0 -1 0.800	0.801/0.000	0.810/0.040	0.844	0.651/0.013	1.222/0.169
040ftest	00010	0 -1 0.400	0.400/0.000	0.444/0.021	0.778	0.221/0.015	1.197/0.324
041ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
042ftest	00011	0 -1 0.900	0.929/0.000	0.910/0.058	0.822	0.564/0.026	2.344/0.604
043ftest	00011	0 -1 0.950	0.987/0.000	1.362/0.048	0.956	0.857/0.024	1.978/0.733
044ftest	00011	0 -1 1.200	1.227/0.000	1.403/0.019	1.000	1.126/0.027	2.389/0.791
045ftest	00011	0 -1 1.550	1.687/0.000	1.493/0.113	0.689	1.005/0.038	3.822/0.926
046ftest	00011	0 -1 1.550	1.656/0.000	1.550/0.089	0.800	1.128/0.040	4.314/0.677
047ftest	00011	0 -1 0.000	0.000/0.000	0.026/0.008	0.156	0.000/0.000	0.000/0.000
048ftest	00011	0 -1 0.000	0.000/0.000	0.031/0.013	0.178	0.000/0.000	0.000/0.000
049ftest	00011	0 -1 1.400	1.489/0.000	1.327/0.101	0.689	1.034/0.037	3.957/0.695
050ftest	00011	0 -1 1.500	1.613/0.000	1.436/0.105	0.689	1.138/0.036	3.957/0.575
051ftest	00011	0 -1 0.950	0.984/0.000	1.119/0.014	1.000	0.821/0.028	2.144/0.885
052ftest	00011	0 -1 1.500	1.595/0.000	1.793/0.018	1.000	1.362/0.032	2.967/0.936
053ftest	00011	0 -1 0.950	0.985/0.000	1.118/0.013	1.000	0.852/0.025	2.022/0.769
054ftest	00011	0 -1 1.250	1.306/0.000	1.157/0.091	0.667	0.861/0.041	3.644/0.989
055ftest	00011	0 -1 1.550	1.676/0.000	1.505/0.086	0.822	1.040/0.035	3.910/1.088

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
056ftest	00011	0 -1 1.700	1.724/0.000	1.575/0.115	0.689	1.099/0.040	4.357/0.674
057ftest	00011	0 -1 0.450	0.463/0.000	0.455/0.037	0.667	0.125/0.026	1.956/0.669
058ftest	00011	0 -1 0.200	0.210/0.000	0.197/0.013	0.778	0.000/0.000	1.797/0.748
059ftest	00011	0 -1 0.000	0.000/0.000	0.036/0.015	0.133	0.000/0.000	0.000/0.000
060ftest	00011	0 -1 1.400	1.472/0.000	1.310/0.110	0.689	1.188/0.028	2.656/0.720
061ftest	00011	0 -1 1.400	1.487/0.000	1.423/0.092	0.778	1.121/0.027	2.833/0.490
062ftest	00011	0 -1 1.000	1.031/0.000	1.178/0.015	1.000	0.911/0.026	2.122/0.801
063ftest	00011	0 -1 1.400	1.481/0.000	1.344/0.094	0.667	0.876/0.041	3.789/0.917
064ftest	00011	0 -1 1.450	1.535/0.000	1.730/0.019	1.000	1.331/0.032	2.889/0.919
065ftest	00011	0 -1 1.600	1.602/0.000	1.588/0.106	0.800	1.272/0.033	3.560/0.949
066ftest	00011	0 -1 1.100	1.158/0.000	1.307/0.012	1.000	0.997/0.022	2.056/0.585
067ftest	00011	0 -1 1.600	1.602/0.000	1.448/0.109	0.689	1.193/0.044	4.089/1.021
068ftest	00011	0 -1 1.650	1.656/0.000	1.902/0.026	1.000	1.491/0.035	3.100/0.979
069ftest	00011	0 -1 1.100	1.166/0.000	1.094/0.065	0.822	0.906/0.020	1.967/0.464
070ftest	00011	0 -1 1.700	1.721/0.000	1.566/0.115	0.689	1.326/0.037	3.811/0.866
071ftest	00011	0 -1 0.450	0.466/0.000	0.427/0.027	0.800	0.226/0.023	2.035/0.933
072ftest	00011	0 -1 1.000	1.033/0.000	1.021/0.062	0.822	0.675/0.032	2.678/0.796
073ftest	00011	0 -1 1.350	1.435/0.000	1.351/0.101	0.800	1.066/0.032	2.967/0.732
074ftest	00011	0 -1 0.550	0.581/0.000	0.565/0.047	0.667	0.177/0.029	2.267/0.729
075ftest	00011	0 -1 1.000	1.034/0.000	0.897/0.064	0.778	0.619/0.037	3.671/0.814
076ftest	00011	0 -1 1.600	1.609/0.000	1.574/0.101	0.733	1.220/0.040	3.822/0.895
077ftest	00011	0 -1 1.350	1.443/0.000	1.335/0.081	0.822	0.938/0.025	2.422/0.627
078ftest	00011	0 -1 0.000	0.000/0.000	0.038/0.017	0.111	0.000/0.000	0.000/0.000
079ftest	00011	0 -1 0.350	0.392/0.000	0.475/0.007	1.000	0.244/0.025	1.456/0.911
080ftest	00011	0 -1 1.050	1.120/0.000	0.981/0.061	0.822	0.666/0.034	3.429/0.724
081ftest	00100	0 -1 0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
082ftest	00100	0 -1 0.900	0.921/0.000	1.053/0.008	1.000	0.881/0.013	1.190/0.030
083ftest	00100	0 -1 0.000	0.000/0.000	0.081/0.068	0.422	0.000/0.000	0.000/0.000
084ftest	00100	0 -1 0.000	0.000/0.000	0.140/0.119	0.156	0.000/0.000	0.000/0.000
085ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.355/0.358
086ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.468/0.473
087ftest	00100	0 -1 0.600	0.670/0.000	0.753/0.003	1.000	0.591/0.011	0.861/0.021
088ftest	00100	0 -1 0.500	0.514/0.000	0.622/0.002	1.000	0.478/0.010	0.704/0.024
089ftest	00100	0 -1 0.800	0.796/0.000	0.996/0.027	1.000	0.776/0.012	1.000/0.000
090ftest	00100	0 -1 0.050	0.050/0.000	0.068/0.002	0.956	0.035/0.010	0.065/0.001
091ftest	00100	0 -1 0.800	0.796/0.000	0.996/0.027	1.000	0.776/0.012	1.000/0.000
092ftest	00100	0 -1 0.000	0.000/0.000	0.089/0.075	0.311	0.000/0.000	0.000/0.000
093ftest	00100	0 -1 0.500	0.514/0.000	0.622/0.002	1.000	0.478/0.010	0.704/0.024
094ftest	00100	0 -1 0.850	0.860/0.000	0.986/0.009	1.000	0.822/0.013	1.090/0.030
095ftest	00100	0 -1 0.000	0.000/0.000	0.115/0.088	0.289	0.000/0.000	0.000/0.000
096ftest	00100	0 -1 0.000	0.000/0.000	0.115/0.088	0.289	0.000/0.000	0.000/0.000
097ftest	00100	0 -1 0.600	0.670/0.000	0.753/0.003	1.000	0.591/0.011	0.861/0.021
098ftest	00100	0 -1 0.650	0.736/0.000	0.811/0.005	1.000	0.618/0.011	0.928/0.040
099ftest	00100	0 -1 0.600	0.670/0.000	0.753/0.003	1.000	0.591/0.011	0.861/0.021
100ftest	00100	0 -1 0.150	0.160/0.000	0.200/0.004	1.000	0.120/0.010	0.221/0.013
101ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
102ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.111/0.125
103ftest	00100	0 -1 0.200	0.199/0.000	0.267/0.000	1.000	0.197/0.010	0.294/0.005
104ftest	00100	0 -1 0.250	0.254/0.000	0.324/0.004	1.000	0.216/0.010	0.368/0.019
105ftest	00100	0 -1 0.100	0.099/0.000	0.135/0.002	1.000	0.100/0.010	0.143/0.005
106ftest	00100	0 -1 0.000	0.000/0.000	0.136/0.109	0.333	0.000/0.000	0.000/0.000
107ftest	00100	0 -1 0.000	0.000/0.000	0.034/0.006	0.489	0.000/0.000	0.000/0.000
108ftest	00100	0 -1 0.000	0.000/0.000	0.083/0.057	0.244	0.000/0.000	0.000/0.000
109ftest	00100	0 -1 0.000	0.000/0.000	0.034/0.032	0.111	0.000/0.000	0.000/0.000
110ftest	00100	0 -1 0.000	0.000/0.000	0.054/0.040	0.311	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
111ftest	00100	0 -1 0.450	0.458/0.000	0.553/0.003	1.000	0.423/0.010	0.636/0.016
112ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.293/0.300
113ftest	00100	0 -1 0.000	0.000/0.000	0.027/0.016	0.133	0.000/0.000	0.000/0.000
114ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.052/0.069
115ftest	00100	0 -1 0.550	0.574/0.000	0.687/0.004	1.000	0.511/0.011	0.785/0.033
116ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.000/0.000
117ftest	00100	0 -1 0.000	0.000/0.000	0.117/0.108	0.156	0.000/0.000	0.000/0.000
118ftest	00100	0 -1 0.000	0.000/0.000	0.063/0.059	0.156	0.000/0.000	0.000/0.000
119ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.000/0.000
120ftest	00100	0 -1 0.000	0.000/0.000	0.089/0.075	0.311	0.000/0.000	0.000/0.000
121ftest	00101	0 -1 0.000	0.000/0.000	0.205/0.169	0.133	0.000/0.000	0.000/0.000
122ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.948/0.916
123ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.562/0.561
124ftest	00101	0 -1 0.000	0.000/0.000	0.237/0.197	0.133	0.000/0.000	0.000/0.000
125ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.000/0.000	0.907/0.879
126ftest	00101	0 -1 1.400	1.462/0.000	1.670/0.012	1.000	1.361/0.018	1.910/0.054
127ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.659/0.649
128ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.659/0.649
129ftest	00101	0 -1 0.000	0.000/0.000	0.222/0.187	0.133	0.000/0.000	0.000/0.000
130ftest	00101	0 -1 1.550	1.655/0.000	1.863/0.010	1.000	1.486/0.019	2.156/0.050
131ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.626/0.618
132ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.807/0.796
133ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.501/0.502
134ftest	00101	0 -1 1.450	1.530/0.000	1.728/0.011	1.000	1.379/0.018	1.970/0.064
135ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.748/0.737
136ftest	00101	0 -1 0.000	0.000/0.000	0.165/0.142	0.156	0.000/0.000	0.000/0.000
137ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.893/0.854
138ftest	00101	0 -1 1.600	1.591/0.000	1.894/0.029	1.000	1.555/0.020	2.089/0.031
139ftest	00101	0 -1 0.000	0.000/0.000	0.237/0.197	0.133	0.000/0.000	0.000/0.000
140ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.903/0.881
141ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.501/0.502
142ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.501/0.502
143ftest	00101	0 -1 1.700	1.716/0.000	1.972/0.018	1.000	1.657/0.021	2.230/0.064
144ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.022	0.000/0.000	0.659/0.649
145ftest	00101	0 -1 1.450	1.530/0.000	1.728/0.011	1.000	1.379/0.018	1.970/0.064
146ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.807/0.796
147ftest	00101	0 -1 1.350	1.418/0.000	1.605/0.010	1.000	1.303/0.017	1.830/0.064
148ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.000	0.000/0.000	0.882/0.861
149ftest	00101	0 -1 0.950	0.985/0.000	1.119/0.007	1.000	0.896/0.013	1.300/0.000
150ftest	00101	0 -1 0.000	0.000/0.000	0.273/0.230	0.156	0.000/0.000	0.000/0.000
151ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.626/0.618
152ftest	00101	0 -1 0.000	0.000/0.000	0.190/0.160	0.133	0.000/0.000	0.000/0.000
153ftest	00101	0 -1 1.000	1.030/0.000	1.183/0.010	1.000	0.971/0.014	1.330/0.064
154ftest	00101	0 -1 1.500	1.591/0.000	1.798/0.010	1.000	1.431/0.019	2.050/0.081
155ftest	00101	0 -1 0.000	0.000/0.000	0.186/0.168	0.111	0.000/0.000	0.000/0.000
156ftest	00101	0 -1 0.000	0.000/0.000	0.165/0.142	0.156	0.000/0.000	0.000/0.000
157ftest	00101	0 -1 0.000	0.028/0.000	0.261/0.225	0.133	0.000/0.000	0.000/0.000
158ftest	00101	0 -1 1.350	1.418/0.000	1.605/0.010	1.000	1.303/0.017	1.830/0.064
159ftest	00101	0 -1 1.600	1.591/0.000	1.894/0.029	1.000	1.555/0.020	2.089/0.031
160ftest	00101	0 -1 0.000	0.000/0.000	0.172/0.149	0.133	0.000/0.000	0.000/0.000
161ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
162ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
163ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
164ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
165ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
166ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
167ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
168ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
169ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
170ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
171ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
172ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
173ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
174ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
175ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
176ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
177ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
178ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
179ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
180ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
181ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
182ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
183ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
184ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
185ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
186ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
187ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
188ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
189ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
190ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
191ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
192ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
193ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
194ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
195ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
196ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
197ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
198ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
199ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
200ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
201ftest	10010	0 -1 0.100	0.112/0.000	0.167/0.008	0.956	0.000/0.000	0.000/0.000
202ftest	10010	0 -1 0.850	0.853/0.000	0.799/0.048	0.844	0.000/0.000	2.033/0.462
203ftest	10010	0 -1 0.650	0.763/0.000	1.900/0.756	0.489	0.000/0.000	1.644/0.758
204ftest	10010	0 -1 0.100	0.131/0.000	0.483/0.180	0.356	0.000/0.000	0.549/0.358
205ftest	10010	0 -1 0.650	0.728/0.000	1.758/0.784	0.600	0.000/0.000	1.179/0.321
206ftest	10010	0 -1 0.650	0.751/0.000	0.639/0.031	0.933	0.000/0.000	1.544/0.417
207ftest	10010	0 -1 0.650	0.825/0.000	0.773/0.042	0.778	1.401/0.018	0.000/0.000
208ftest	10010	0 -1 0.250	0.255/0.000	0.266/0.018	0.800	0.000/0.000	0.980/0.354
209ftest	10010	0 -1 0.450	0.538/0.000	1.647/0.246	0.422	0.550/0.017	0.000/0.000
210ftest	10010	0 -1 0.000	0.000/0.000	0.351/0.309	0.089	0.000/0.000	0.000/0.000
211ftest	10010	0 -1 0.350	0.419/0.000	1.603/0.679	0.311	0.350/0.025	1.253/0.311
212ftest	10010	0 -1 0.550	0.585/0.000	1.724/0.535	0.511	1.142/0.055	1.552/0.525
213ftest	10010	0 -1 0.250	0.321/0.000	0.688/0.043	0.822	0.000/0.000	0.984/0.389
214ftest	10010	0 -1 0.550	0.669/0.000	0.739/0.016	1.000	0.000/0.000	1.212/0.621
215ftest	10010	0 -1 0.550	0.669/0.000	0.674/0.027	0.956	0.884/0.019	1.142/0.193
216ftest	10010	0 -1 0.100	0.172/0.000	0.474/0.070	0.444	1.002/0.017	0.666/0.433
217ftest	10010	0 -1 0.800	0.801/0.000	0.713/0.044	0.756	0.750/0.023	2.122/0.707
218ftest	10010	0 -1 0.650	0.759/0.000	0.668/0.054	0.689	0.667/0.022	2.044/0.542
219ftest	10010	0 -1 0.500	0.524/0.000	0.753/0.069	0.689	0.000/0.000	1.257/0.309
220ftest	10010	0 -1 0.250	0.256/0.000	1.416/0.576	0.333	0.912/0.033	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
221ftest	10010	0 -1	0.700	0.861/0.000	0.886/0.079	0.711	0.000/0.000 2.256/0.275
222ftest	10010	0 -1	0.050	0.059/0.000	0.222/0.032	0.533	0.000/0.000 0.000/0.000
223ftest	10010	0 -1	0.000	0.000/0.000	0.157/0.075	0.111	1.017/0.025 0.000/0.000
224ftest	10010	0 -1	0.550	0.569/0.000	2.670/0.217	0.689	2.297/0.033 1.925/0.595
225ftest	10010	0 -1	0.550	0.537/0.000	0.957/0.031	0.956	0.000/0.000 0.000/0.000
226ftest	10010	0 -1	0.500	0.511/0.000	0.537/0.034	0.800	0.321/0.017 1.417/0.374
227ftest	10010	0 -1	0.300	0.344/0.000	0.849/0.154	0.378	0.000/0.000 0.635/0.192
228ftest	10010	0 -1	0.550	0.593/0.000	0.564/0.038	0.733	0.180/0.018 1.186/0.432
229ftest	10010	0 -1	0.150	0.167/0.000	0.347/0.016	0.844	0.000/0.000 0.000/0.000
230ftest	10010	0 -1	0.000	0.000/0.000	0.197/0.071	0.178	0.516/0.015 0.000/0.000
231ftest	10010	0 -1	0.100	0.131/0.000	0.341/0.071	0.444	0.000/0.000 0.668/0.393
232ftest	10010	0 -1	0.250	0.284/0.000	0.991/0.286	0.289	2.323/0.035 0.000/0.000
233ftest	10010	0 -1	0.350	0.358/0.000	0.575/0.028	0.911	0.000/0.000 1.064/0.734
234ftest	10010	0 -1	0.550	0.572/0.000	0.739/0.138	0.600	0.000/0.000 0.000/0.000
235ftest	10010	0 -1	0.350	0.408/0.000	0.573/0.095	0.511	0.000/0.000 0.921/0.508
236ftest	10010	0 -1	0.300	0.265/0.000	0.740/0.208	0.400	1.074/0.052 0.000/0.000
237ftest	10010	0 -1	0.050	0.052/0.000	0.069/0.005	0.689	0.308/0.010 0.000/0.000
238ftest	10010	0 -1	0.550	0.662/0.000	0.701/0.056	0.800	0.000/0.000 2.210/1.149
239ftest	10010	0 -1	0.750	0.902/0.000	2.307/0.490	0.311	0.054/0.023 2.070/0.469
240ftest	10010	0 -1	0.400	0.438/0.000	0.479/0.016	1.000	0.000/0.000 1.066/0.294
241ftest	10011	0 -1	1.450	1.589/0.000	2.285/0.067	1.000	0.000/0.000 3.189/0.875
242ftest	10011	0 -1	1.100	1.154/0.000	1.493/0.048	0.956	0.945/0.023 2.111/0.647
243ftest	10011	0 -1	1.100	1.181/0.000	1.173/0.052	0.933	0.088/0.032 3.167/0.811
244ftest	10011	0 -1	1.450	1.591/0.000	2.881/0.581	0.467	0.000/0.000 2.711/0.468
245ftest	10011	0 -1	1.350	1.383/0.000	1.933/0.061	0.956	0.000/0.000 2.778/0.928
246ftest	10011	0 -1	1.650	1.677/0.000	1.576/0.097	0.822	1.517/0.027 2.844/0.647
247ftest	10011	0 -1	0.550	0.591/0.000	2.358/0.776	0.356	0.000/0.000 2.422/0.794
248ftest	10011	0 -1	0.000	0.000/0.000	2.121/0.692	0.200	1.612/0.047 0.000/0.000
249ftest	10011	0 -1	0.700	0.792/0.000	0.736/0.035	0.867	0.000/0.000 3.162/0.964
250ftest	10011	0 -1	1.700	1.664/0.000	2.126/0.045	0.933	0.807/0.035 3.022/0.797
251ftest	10011	0 -1	0.750	0.781/0.000	1.087/0.075	0.711	0.000/0.000 3.044/1.047
252ftest	10011	0 -1	0.000	0.000/0.000	0.037/0.017	0.111	0.000/0.000 0.000/0.000
253ftest	10011	0 -1	1.300	1.355/0.000	1.329/0.100	0.711	0.000/0.000 3.929/0.730
254ftest	10011	0 -1	1.250	1.306/0.000	1.267/0.083	0.689	0.000/0.000 2.711/0.832
255ftest	10011	0 -1	1.400	1.515/0.000	3.468/0.516	0.444	3.391/0.040 2.500/0.467
256ftest	10011	0 -1	1.000	1.024/0.000	3.456/0.739	0.333	0.356/0.026 2.100/0.653
257ftest	10011	0 -1	1.150	1.279/0.000	1.078/0.074	0.689	0.000/0.000 3.378/0.883
258ftest	10011	0 -1	1.200	1.232/0.000	1.116/0.045	0.889	0.834/0.037 3.222/0.832
259ftest	10011	0 -1	0.150	0.152/0.000	1.426/0.786	0.289	0.000/0.000 0.000/0.000
260ftest	10011	0 -1	1.100	1.189/0.000	2.903/0.537	0.422	0.524/0.031 2.200/0.653
261ftest	10011	0 -1	0.000	0.029/0.000	0.511/0.295	0.044	0.000/0.000 0.877/0.597
262ftest	10011	0 -1	1.250	1.295/0.000	1.974/0.081	0.889	0.000/0.000 2.689/0.922
263ftest	10011	0 -1	1.500	1.653/0.000	3.465/0.585	0.467	2.664/0.061 2.930/0.843
264ftest	10011	0 -1	1.100	1.122/0.000	3.881/0.738	0.333	4.558/0.058 3.656/1.111
265ftest	10011	0 -1	1.050	1.138/0.000	4.324/0.723	0.422	1.841/0.064 3.733/1.119
266ftest	10011	0 -1	1.050	1.066/0.000	1.186/0.064	0.822	0.132/0.042 2.825/0.504
267ftest	10011	0 -1	1.550	1.663/0.000	3.911/0.623	0.533	1.119/0.028 4.089/0.935
268ftest	10011	0 -1	0.200	0.219/0.000	0.885/0.057	0.911	0.904/0.038 1.769/0.762
269ftest	10011	0 -1	1.700	1.697/0.000	1.725/0.095	0.756	0.915/0.039 2.800/0.521
270ftest	10011	0 -1	1.600	1.676/0.000	1.558/0.091	0.844	0.928/0.050 3.300/0.781
271ftest	10011	0 -1	1.250	1.402/0.000	1.462/0.092	0.778	0.000/0.000 3.357/0.389
272ftest	10011	0 -1	1.550	1.664/0.000	1.411/0.043	1.000	0.000/0.000 2.767/0.556
273ftest	10011	0 -1	1.300	1.380/0.000	1.438/0.054	0.889	0.574/0.035 3.278/0.824
274ftest	10011	0 -1	1.500	1.596/0.000	1.997/0.073	0.978	0.000/0.000 2.411/0.398
275ftest	10011	0 -1	0.000	0.000/0.000	0.188/0.171	0.067	0.874/0.038 0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
276ftest	10011	0 -1 1.300	1.377/0.000	1.895/0.056	0.956	0.154/0.042	3.522/0.864
277ftest	10011	0 -1 1.200	1.291/0.000	1.224/0.065	0.822	0.568/0.037	3.090/1.082
278ftest	10011	0 -1 1.450	1.582/0.000	1.788/0.098	0.756	1.672/0.059	3.922/0.932
279ftest	10011	0 -1 0.850	0.880/0.000	0.746/0.056	0.800	1.038/0.031	3.267/1.058
280ftest	10011	0 -1 1.050	1.094/0.000	1.833/0.324	0.489	0.000/0.000	2.489/0.700
281ftest	10100	0 -1 0.250	0.258/0.000	0.520/0.121	0.644	0.000/0.000	0.000/0.000
282ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.603/0.016	0.000/0.000
283ftest	10100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.354/0.318
284ftest	10100	0 -1 0.000	0.000/0.000	1.715/0.483	0.178	7.379/0.085	0.000/0.000
285ftest	10100	0 -1 0.000	0.000/0.000	0.539/0.081	0.400	0.000/0.000	0.000/0.000
286ftest	10100	0 -1 0.500	0.529/0.000	1.987/0.505	0.356	4.775/0.054	0.000/0.000
287ftest	10100	0 -1 0.000	0.000/0.000	0.279/0.219	0.178	0.000/0.000	0.000/0.000
288ftest	10100	0 -1 0.000	0.000/0.000	0.518/0.488	0.044	1.038/0.015	0.144/0.159
289ftest	10100	0 -1 0.000	0.000/0.000	0.321/0.162	0.178	0.632/0.031	0.000/0.000
290ftest	10100	0 -1 0.400	0.403/0.000	0.706/0.124	0.689	0.072/0.023	0.556/0.011
291ftest	10100	0 -1 0.000	0.036/0.000	0.042/0.030	0.089	0.000/0.000	0.000/0.000
292ftest	10100	0 -1 0.700	0.745/0.000	1.026/0.072	0.822	0.000/0.000	1.058/0.113
293ftest	10100	0 -1 0.000	0.000/0.000	0.675/0.375	0.178	0.000/0.000	0.000/0.000
294ftest	10100	0 -1 0.000	0.079/0.000	0.583/0.180	0.267	1.071/0.022	0.000/0.000
295ftest	10100	0 -1 0.550	0.655/0.000	1.634/0.559	0.467	1.354/0.035	0.979/0.229
296ftest	10100	0 -1 0.000	0.062/0.000	0.681/0.382	0.222	0.890/0.025	0.000/0.000
297ftest	10100	0 -1 0.000	0.045/0.000	0.908/0.468	0.156	1.289/0.017	0.000/0.000
298ftest	10100	0 -1 0.100	0.108/0.000	0.134/0.002	1.000	1.217/0.027	0.207/0.116
299ftest	10100	0 -1 0.000	0.000/0.000	0.205/0.122	0.133	0.000/0.000	0.000/0.000
300ftest	10100	0 -1 0.000	0.000/0.000	1.489/0.543	0.133	0.000/0.000	0.000/0.000
301ftest	10100	0 -1 0.450	0.444/0.000	0.575/0.017	0.933	0.905/0.034	0.000/0.000
302ftest	10100	0 -1 0.100	0.129/0.000	0.351/0.137	0.422	0.000/0.000	0.000/0.000
303ftest	10100	0 -1 0.450	0.415/0.000	1.089/0.433	0.578	0.000/0.000	0.733/0.308
304ftest	10100	0 -1 0.000	0.000/0.000	1.039/0.622	0.178	0.000/0.000	0.000/0.000
305ftest	10100	0 -1 0.000	0.000/0.000	0.146/0.098	0.067	0.000/0.000	0.627/0.550
306ftest	10100	0 -1 0.000	0.040/0.000	0.713/0.280	0.156	0.000/0.000	0.000/0.000
307ftest	10100	0 -1 0.000	0.050/0.000	0.058/0.036	0.200	0.146/0.010	0.000/0.000
308ftest	10100	0 -1 0.100	0.102/0.000	0.134/0.003	1.000	0.000/0.000	0.144/0.005
309ftest	10100	0 -1 0.000	0.000/0.000	0.227/0.069	0.222	0.000/0.000	0.000/0.000
310ftest	10100	0 -1 0.000	0.034/0.000	0.518/0.356	0.067	0.190/0.011	0.000/0.000
311ftest	10100	0 -1 0.750	0.993/0.000	1.663/0.598	0.556	0.000/0.000	1.286/0.223
312ftest	10100	0 -1 0.000	0.051/0.000	0.335/0.194	0.111	0.000/0.000	0.000/0.000
313ftest	10100	0 -1 0.000	0.000/0.000	0.167/0.125	0.133	0.000/0.000	0.000/0.000
314ftest	10100	0 -1 0.650	0.870/0.000	1.140/0.189	0.622	0.000/0.000	0.000/0.000
315ftest	10100	0 -1 0.000	0.062/0.000	1.911/0.641	0.222	0.000/0.000	0.000/0.000
316ftest	10100	0 -1 0.000	0.066/0.000	1.160/0.397	0.200	0.000/0.000	0.000/0.000
317ftest	10100	0 -1 0.600	0.666/0.000	1.126/0.238	0.489	0.000/0.000	0.887/0.088
318ftest	10100	0 -1 0.550	0.585/0.000	0.691/0.007	1.000	0.000/0.000	0.811/0.105
319ftest	10100	0 -1 0.000	0.000/0.000	0.025/0.020	0.089	0.000/0.000	0.000/0.000
320ftest	10100	0 -1 0.000	0.000/0.000	0.485/0.183	0.200	0.000/0.000	0.000/0.000
321ftest	10101	0 -1 0.000	0.000/0.000	0.225/0.157	0.156	0.000/0.022	0.000/0.000
322ftest	10101	0 -1 1.050	1.126/0.000	1.437/0.072	0.867	0.000/0.000	1.520/0.172
323ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.044	0.000/0.000	0.748/0.737
324ftest	10101	0 -1 1.600	1.591/0.000	2.095/0.393	0.689	1.063/0.015	2.122/0.103
325ftest	10101	0 -1 0.000	0.034/0.000	0.034/0.001	0.933	0.473/0.014	0.000/0.000
326ftest	10101	0 -1 0.000	0.052/0.000	0.312/0.097	0.378	0.000/0.000	0.000/0.000
327ftest	10101	0 -1 0.000	0.000/0.000	0.198/0.083	0.089	0.000/0.000	0.886/0.859
328ftest	10101	0 -1 0.000	0.059/0.000	0.567/0.173	0.267	0.156/0.017	0.000/0.000
329ftest	10101	0 -1 0.000	0.040/0.000	0.300/0.189	0.133	0.000/0.000	0.000/0.000
330ftest	10101	0 -1 0.000	0.000/0.000	0.499/0.152	0.333	1.083/0.016	0.904/0.847

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
331ftest	10101	0 -1 0.950	0.971/0.000	1.119/0.007	1.000	1.220/0.016	1.322/0.140
332ftest	10101	0 -1 0.000	0.000/0.000	1.151/0.460	0.244	2.124/0.057	1.082/1.386
333ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.599/0.594
334ftest	10101	0 -1 1.150	1.260/0.000	1.563/0.150	0.644	0.000/0.000	1.567/0.082
335ftest	10101	0 -1 0.000	0.000/0.000	0.076/0.030	0.133	0.152/0.022	0.000/0.000
336ftest	10101	0 -1 1.250	1.301/0.000	1.563/0.069	0.889	4.237/0.050	1.689/0.057
337ftest	10101	0 -1 0.000	0.028/0.000	0.548/0.228	0.156	0.000/0.000	0.000/0.000
338ftest	10101	0 -1 0.000	0.000/0.000	0.191/0.167	0.111	0.000/0.000	0.000/0.000
339ftest	10101	0 -1 0.000	0.000/0.000	0.041/0.024	0.111	0.143/0.020	0.689/0.643
340ftest	10101	0 -1 0.000	0.034/0.000	0.732/0.627	0.111	0.000/0.000	0.000/0.000
341ftest	10101	0 -1 0.000	0.000/0.000	0.192/0.170	0.178	0.000/0.000	0.000/0.000
342ftest	10101	0 -1 0.000	0.028/0.000	0.491/0.246	0.133	0.000/0.000	0.000/0.000
343ftest	10101	0 -1 1.450	1.530/0.000	1.728/0.011	1.000	1.536/0.020	1.970/0.064
344ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.507/0.498
345ftest	10101	0 -1 0.000	0.032/0.000	0.391/0.268	0.156	0.000/0.000	0.000/0.000
346ftest	10101	0 -1 1.200	1.267/0.000	1.541/0.246	0.533	1.072/0.034	1.789/0.197
347ftest	10101	0 -1 0.000	0.000/0.000	0.778/0.317	0.200	0.000/0.000	0.000/0.000
348ftest	10101	0 -1 0.000	0.000/0.000	0.034/0.021	0.156	0.000/0.000	0.000/0.000
349ftest	10101	0 -1 0.000	0.000/0.000	0.310/0.093	0.267	2.085/0.039	0.873/0.761
350ftest	10101	0 -1 1.150	1.228/0.000	1.395/0.060	0.911	0.000/0.000	1.567/0.067
351ftest	10101	0 -1 0.900	0.947/0.000	1.104/0.049	0.867	0.762/0.014	0.000/0.000
352ftest	10101	0 -1 1.700	1.747/0.000	2.031/0.030	1.000	2.441/0.030	2.311/0.110
353ftest	10101	0 -1 0.000	0.059/0.000	0.740/0.468	0.111	0.000/0.000	0.000/0.000
354ftest	10101	0 -1 0.000	0.000/0.000	0.309/0.192	0.022	0.000/0.000	0.913/0.874
355ftest	10101	0 -1 1.650	1.655/0.000	1.906/0.019	1.000	1.556/0.020	2.122/0.063
356ftest	10101	0 -1 0.000	0.043/0.000	0.855/0.427	0.044	0.000/0.000	0.000/0.000
357ftest	10101	0 -1 0.000	0.028/0.000	0.788/0.548	0.089	1.753/0.026	0.000/0.000
358ftest	10101	0 -1 1.650	1.661/0.000	1.985/0.081	0.889	0.749/0.014	2.130/0.064
359ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000	0.537/0.530
360ftest	10101	0 -1 0.000	0.000/0.000	0.335/0.163	0.133	1.741/0.027	0.000/0.000
361ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
362ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
363ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
364ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
365ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
366ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
367ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
368ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
369ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
370ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
371ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
372ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
373ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
374ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
375ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
376ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
377ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
378ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
379ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
380ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
381ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
382ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
383ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
384ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
385ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
386ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
387ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
388ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
389ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
390ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
391ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
392ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
393ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
394ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
395ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
396ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
397ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
398ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
399ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
400ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
001ftest	00010	0 -1 0.800	0.783/0.000	1.009/0.025	0.956	0.962/0.014	1.844/0.904
002ftest	00010	0 -1 0.450	0.459/0.000	0.541/0.013	1.000	0.556/0.010	0.680/0.221
003ftest	00010	0 -1 0.700	0.775/0.000	0.866/0.014	1.000	0.865/0.011	0.998/0.184
004ftest	00010	0 -1 0.100	0.099/0.000	0.146/0.003	0.978	0.162/0.008	0.323/0.223
005ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.070/0.008	0.596/0.680
006ftest	00010	0 -1 0.700	0.776/0.000	0.866/0.015	1.000	0.857/0.012	1.034/0.274
007ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.077/0.011	1.048/1.046
008ftest	00010	0 -1 0.250	0.256/0.000	0.320/0.006	1.000	0.314/0.008	0.356/0.049
009ftest	00010	0 -1 0.750	0.840/0.000	0.989/0.016	1.000	1.073/0.017	1.764/0.978
010ftest	00010	0 -1 0.200	0.196/0.000	0.264/0.011	0.867	0.288/0.008	0.503/0.250
011ftest	00010	0 -1 0.650	0.721/0.000	0.833/0.016	1.000	0.901/0.015	1.442/0.798
012ftest	00010	0 -1 0.250	0.251/0.000	0.385/0.018	0.844	0.423/0.010	1.156/0.838
013ftest	00010	0 -1 0.400	0.387/0.000	0.592/0.023	0.822	0.596/0.013	1.603/1.162
014ftest	00010	0 -1 0.450	0.457/0.000	0.678/0.025	0.889	0.686/0.017	1.843/1.373
015ftest	00010	0 -1 0.550	0.572/0.000	0.729/0.012	1.000	0.797/0.012	1.361/0.710
016ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.062/0.009	0.659/0.699
017ftest	00010	0 -1 0.600	0.655/0.000	0.743/0.015	1.000	0.768/0.012	1.098/0.483
018ftest	00010	0 -1 0.800	0.787/0.000	1.037/0.032	0.867	0.932/0.014	1.978/0.967
019ftest	00010	0 -1 0.150	0.163/0.000	0.199/0.004	1.000	0.222/0.008	0.251/0.105
020ftest	00010	0 -1 0.600	0.650/0.000	0.869/0.035	0.844	0.791/0.013	1.791/0.951
021ftest	00010	0 -1 0.500	0.508/0.000	0.702/0.017	0.978	0.746/0.016	1.683/1.198
022ftest	00010	0 -1 0.000	0.000/0.000	0.028/0.004	0.378	0.093/0.014	1.176/1.279
023ftest	00010	0 -1 0.800	0.796/0.000	0.902/0.015	1.000	0.870/0.011	1.093/0.255
024ftest	00010	0 -1 0.400	0.388/0.000	0.579/0.019	0.911	0.598/0.011	1.562/1.036
025ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.561/0.586
026ftest	00010	0 -1 0.700	0.773/0.000	0.925/0.016	1.000	0.958/0.012	1.502/0.625
027ftest	00010	0 -1 0.650	0.719/0.000	0.839/0.013	1.000	0.855/0.013	1.317/0.611
028ftest	00010	0 -1 0.350	0.388/0.000	0.470/0.007	1.000	0.523/0.013	0.870/0.666
029ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.082/0.008	0.611/0.700
030ftest	00010	0 -1 0.800	0.791/0.000	0.885/0.026	0.978	0.895/0.015	1.199/0.533
031ftest	00010	0 -1 0.800	0.787/0.000	0.980/0.016	1.000	0.877/0.011	1.511/0.475
032ftest	00010	0 -1 0.850	0.848/0.000	1.037/0.016	1.000	1.063/0.017	1.778/0.934
033ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.057/0.009	0.406/0.518
034ftest	00010	0 -1 0.750	0.830/0.000	1.085/0.040	0.844	1.010/0.013	2.044/0.877
035ftest	00010	0 -1 0.350	0.385/0.000	0.536/0.029	0.800	0.624/0.014	1.696/1.307
036ftest	00010	0 -1 0.150	0.166/0.000	0.248/0.009	0.956	0.318/0.013	1.090/1.023
037ftest	00010	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.062/0.013	0.707/0.943
038ftest	00010	0 -1 0.500	0.508/0.000	0.663/0.012	1.000	0.684/0.011	1.210/0.668
039ftest	00010	0 -1 0.300	0.324/0.000	0.500/0.023	0.867	0.453/0.010	1.434/0.894
040ftest	00010	0 -1 0.350	0.389/0.000	0.509/0.012	0.978	0.546/0.012	1.152/0.790
041ftest	00011	0 -1 1.000	1.019/0.000	1.163/0.017	1.000	1.182/0.020	1.589/0.785
042ftest	00011	0 -1 0.650	0.715/0.000	0.936/0.025	0.978	0.957/0.021	2.284/1.602
043ftest	00011	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.118/0.019	1.542/1.748
044ftest	00011	0 -1 0.000	0.000/0.000	0.045/0.006	0.333	0.111/0.022	1.833/2.037
045ftest	00011	0 -1 1.450	1.485/0.000	1.955/0.052	0.956	1.965/0.031	4.122/2.363
046ftest	00011	0 -1 1.600	1.573/0.000	2.055/0.050	0.956	2.002/0.033	4.267/2.401
047ftest	00011	0 -1 0.600	0.651/0.000	0.714/0.026	0.911	0.762/0.016	1.071/0.649
048ftest	00011	0 -1 1.200	1.216/0.000	1.358/0.039	0.978	1.395/0.023	1.856/0.833
049ftest	00011	0 -1 1.450	1.492/0.000	1.928/0.046	0.956	1.863/0.030	3.867/2.129
050ftest	00011	0 -1 1.300	1.314/0.000	1.755/0.050	0.956	1.707/0.029	3.811/2.266
051ftest	00011	0 -1 0.000	0.000/0.000	0.033/0.004	0.356	0.147/0.022	1.622/1.915
052ftest	00011	0 -1 0.000	0.000/0.000	0.051/0.007	0.333	0.169/0.026	2.341/2.588
053ftest	00011	0 -1 0.000	0.000/0.000	0.032/0.004	0.311	0.122/0.020	1.552/1.775
054ftest	00011	0 -1 1.600	1.569/0.000	1.994/0.036	0.978	1.950/0.033	3.889/2.157
055ftest	00011	0 -1 1.400	1.427/0.000	1.910/0.067	0.844	1.863/0.028	3.967/2.205

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
056ftest	00011	0 -1	1.450	1.502/0.000	1.976/0.057	0.956	1.946/0.032 4.222/2.425
057ftest	00011	0 -1	0.900	0.909/0.000	1.093/0.018	1.000	1.150/0.021 2.022/1.219
058ftest	00011	0 -1	1.050	1.083/0.000	1.241/0.026	1.000	1.301/0.022 1.967/1.033
059ftest	00011	0 -1	1.150	1.206/0.000	1.329/0.043	0.978	1.406/0.026 1.933/1.052
060ftest	00011	0 -1	1.400	1.443/0.000	1.877/0.058	0.867	1.687/0.023 3.522/1.611
061ftest	00011	0 -1	0.650	0.705/0.000	1.032/0.050	0.756	0.947/0.022 2.822/1.995
062ftest	00011	0 -1	0.000	0.000/0.000	0.034/0.005	0.311	0.117/0.021 1.614/1.855
063ftest	00011	0 -1	1.300	1.321/0.000	1.730/0.041	0.978	1.739/0.033 3.856/2.462
064ftest	00011	0 -1	0.000	0.000/0.000	0.049/0.007	0.333	0.154/0.026 2.280/2.512
065ftest	00011	0 -1	1.450	1.504/0.000	1.978/0.068	0.867	1.804/0.027 3.867/1.915
066ftest	00011	0 -1	0.000	0.000/0.000	0.032/0.005	0.311	0.127/0.018 1.662/1.796
067ftest	00011	0 -1	1.650	1.636/0.000	2.119/0.047	0.978	2.020/0.035 4.322/2.432
068ftest	00011	0 -1	0.000	0.000/0.000	0.056/0.008	0.333	0.149/0.028 2.428/2.625
069ftest	00011	0 -1	0.900	0.903/0.000	1.224/0.048	0.844	1.124/0.017 2.500/1.292
070ftest	00011	0 -1	1.400	1.441/0.000	1.909/0.059	0.911	1.784/0.030 4.089/2.318
071ftest	00011	0 -1	1.200	1.212/0.000	1.463/0.022	1.000	1.415/0.019 2.267/0.904
072ftest	00011	0 -1	0.550	0.568/0.000	0.826/0.025	0.956	0.860/0.026 2.420/1.996
073ftest	00011	0 -1	1.650	1.632/0.000	2.107/0.055	0.956	1.976/0.026 3.800/1.674
074ftest	00011	0 -1	1.050	1.082/0.000	1.303/0.020	1.000	1.364/0.023 2.422/1.363
075ftest	00011	0 -1	1.700	1.704/0.000	2.115/0.042	1.000	2.032/0.030 3.678/1.772
076ftest	00011	0 -1	1.150	1.193/0.000	1.602/0.048	0.956	1.517/0.033 3.811/2.500
077ftest	00011	0 -1	1.150	1.184/0.000	1.589/0.058	0.844	1.537/0.020 3.156/1.582
078ftest	00011	0 -1	1.400	1.444/0.000	1.611/0.036	1.000	1.638/0.021 2.044/0.627
079ftest	00011	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.145/0.020 0.995/1.415
080ftest	00011	0 -1	1.450	1.496/0.000	1.891/0.046	0.978	1.853/0.028 3.433/1.733
081ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.155/0.177
082ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.378	0.034/0.011 1.099/1.028
083ftest	00100	0 -1	0.450	0.455/0.000	0.543/0.008	1.000	0.520/0.009 0.591/0.042
084ftest	00100	0 -1	0.850	0.859/0.000	0.974/0.014	1.000	0.937/0.011 1.064/0.084
085ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.000/0.000 0.000/0.000
086ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.000/0.000
087ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.035/0.009 0.813/0.796
088ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.133	0.027/0.008 0.656/0.644
089ftest	00100	0 -1	0.000	0.000/0.000	0.064/0.026	0.200	0.000/0.000 1.031/0.915
090ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.076/0.093
091ftest	00100	0 -1	0.000	0.000/0.000	0.064/0.026	0.200	0.000/0.000 1.031/0.915
092ftest	00100	0 -1	0.500	0.509/0.000	0.611/0.008	1.000	0.593/0.009 0.665/0.043
093ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.133	0.027/0.008 0.656/0.644
094ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.400	0.031/0.010 1.011/0.951
095ftest	00100	0 -1	0.550	0.568/0.000	0.678/0.011	1.000	0.663/0.009 0.730/0.054
096ftest	00100	0 -1	0.550	0.568/0.000	0.678/0.011	1.000	0.663/0.009 0.730/0.054
097ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.035/0.009 0.813/0.796
098ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.089	0.053/0.009 0.893/0.905
099ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.035/0.009 0.813/0.796
100ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000 0.234/0.268
101ftest	00100	0 -1	0.100	0.100/0.000	0.134/0.001	1.000	0.117/0.008 0.136/0.005
102ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.200	0.000/0.000 0.000/0.000
103ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.244	0.000/0.000 0.302/0.320
104ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.133	0.031/0.008 0.371/0.406
105ftest	00100	0 -1	0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000 0.155/0.177
106ftest	00100	0 -1	0.700	0.771/0.000	0.867/0.014	1.000	0.841/0.010 0.976/0.064
107ftest	00100	0 -1	0.650	0.713/0.000	0.798/0.012	1.000	0.779/0.010 0.887/0.070
108ftest	00100	0 -1	0.350	0.388/0.000	0.453/0.008	1.000	0.438/0.008 0.496/0.041
109ftest	00100	0 -1	0.200	0.199/0.000	0.267/0.000	1.000	0.227/0.008 0.281/0.006
110ftest	00100	0 -1	0.250	0.253/0.000	0.322/0.005	1.000	0.307/0.008 0.345/0.025

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
111ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.133	0.000/0.000	0.584/0.573
112ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.000/0.000	0.000/0.000
113ftest	00100	0 -1 0.050	0.050/0.000	0.068/0.001	1.000	0.056/0.008	0.064/0.003
114ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
115ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.045/0.009	0.738/0.724
116ftest	00100	0 -1 0.100	0.100/0.000	0.134/0.001	1.000	0.117/0.008	0.136/0.005
117ftest	00100	0 -1 0.800	0.798/0.000	0.962/0.011	1.000	0.821/0.010	1.050/0.050
118ftest	00100	0 -1 0.400	0.398/0.000	0.503/0.003	1.000	0.426/0.008	0.553/0.005
119ftest	00100	0 -1 0.000	0.000/0.000	0.000/0.000	0.222	0.000/0.000	0.000/0.000
120ftest	00100	0 -1 0.500	0.509/0.000	0.611/0.008	1.000	0.593/0.009	0.665/0.043
121ftest	00101	0 -1 1.150	1.201/0.000	1.361/0.021	1.000	1.336/0.014	1.510/0.122
122ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.057/0.019	0.000/0.000
123ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.029/0.013	0.000/0.000
124ftest	00101	0 -1 1.350	1.393/0.000	1.584/0.026	1.000	1.528/0.015	1.756/0.134
125ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.049/0.018	0.000/0.000
126ftest	00101	0 -1 0.000	0.000/0.000	0.036/0.005	0.333	0.079/0.014	1.753/1.645
127ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.052/0.014	0.000/0.000
128ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.052/0.014	0.000/0.000
129ftest	00101	0 -1 1.300	1.332/0.000	1.521/0.023	1.000	1.441/0.015	1.670/0.119
130ftest	00101	0 -1 0.000	0.000/0.000	0.041/0.006	0.311	0.126/0.016	1.983/1.882
131ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.037/0.014	0.000/0.000
132ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.048/0.017	0.000/0.000
133ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
134ftest	00101	0 -1 0.000	0.000/0.000	0.042/0.006	0.311	0.103/0.015	1.827/1.730
135ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.111	0.045/0.016	0.000/0.000
136ftest	00101	0 -1 1.000	1.020/0.000	1.175/0.014	1.000	1.118/0.012	1.290/0.083
137ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.040/0.018	0.000/0.000
138ftest	00101	0 -1 0.000	0.000/0.000	0.104/0.044	0.222	0.061/0.016	1.936/1.745
139ftest	00101	0 -1 1.350	1.393/0.000	1.584/0.026	1.000	1.528/0.015	1.756/0.134
140ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.084/0.018	0.000/0.000
141ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
142ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
143ftest	00101	0 -1 0.000	0.000/0.000	0.033/0.006	0.422	0.077/0.017	2.056/1.897
144ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.052/0.014	0.000/0.000
145ftest	00101	0 -1 0.000	0.000/0.000	0.042/0.006	0.311	0.103/0.015	1.827/1.730
146ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.048/0.017	0.000/0.000
147ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.006	0.311	0.087/0.014	1.701/1.610
148ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.060/0.018	0.000/0.000
149ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.333	0.067/0.011	1.181/1.120
150ftest	00101	0 -1 1.650	1.654/0.000	1.882/0.029	1.000	1.810/0.018	2.157/0.118
151ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.156	0.037/0.014	0.000/0.000
152ftest	00101	0 -1 1.100	1.138/0.000	1.299/0.018	1.000	1.263/0.013	1.475/0.066
153ftest	00101	0 -1 0.000	0.000/0.000	0.000/0.000	0.378	0.046/0.011	1.243/1.174
154ftest	00101	0 -1 0.000	0.000/0.000	0.040/0.006	0.333	0.102/0.015	1.900/1.813
155ftest	00101	0 -1 1.200	1.211/0.000	1.410/0.015	1.000	1.306/0.014	1.556/0.050
156ftest	00101	0 -1 1.000	1.020/0.000	1.175/0.014	1.000	1.118/0.012	1.290/0.083
157ftest	00101	0 -1 1.550	1.622/0.000	1.838/0.030	1.000	1.802/0.018	2.020/0.154
158ftest	00101	0 -1 0.000	0.000/0.000	0.038/0.006	0.311	0.087/0.014	1.701/1.610
159ftest	00101	0 -1 0.000	0.000/0.000	0.104/0.044	0.222	0.061/0.016	1.936/1.745
160ftest	00101	0 -1 1.050	1.080/0.000	1.229/0.019	1.000	1.201/0.013	1.375/0.066
161ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
162ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
163ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
164ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
165ftest	01000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
166ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
167ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
168ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
169ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
170ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
171ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
172ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
173ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
174ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
175ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
176ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
177ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
178ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
179ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
180ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
181ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
182ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
183ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
184ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
185ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
186ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
187ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
188ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
189ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
190ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
191ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
192ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
193ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
194ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
195ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
196ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
197ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
198ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
199ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
200ftest	01000	0 -1	0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000
201ftest	10010	0 -1	0.750	0.841/0.000	0.951/0.014	1.000	0.945/0.011
202ftest	10010	0 -1	0.550	0.643/0.000	0.836/0.044	0.800	7.030/0.092
203ftest	10010	0 -1	0.000	0.000/0.000	0.292/0.151	0.200	3.309/0.053
204ftest	10010	0 -1	0.000	0.000/0.000	0.262/0.231	0.111	3.104/0.066
205ftest	10010	0 -1	0.050	0.077/0.000	0.520/0.352	0.333	4.752/0.060
206ftest	10010	0 -1	0.850	0.858/0.000	1.087/0.027	0.956	3.135/0.029
207ftest	10010	0 -1	0.650	0.734/0.000	0.911/0.028	0.889	0.000/0.000
208ftest	10010	0 -1	0.800	0.789/0.000	0.947/0.012	1.000	1.176/0.019
209ftest	10010	0 -1	0.300	0.338/0.000	0.531/0.067	0.556	0.859/0.014
210ftest	10010	0 -1	0.750	0.873/0.000	0.933/0.034	0.978	0.190/0.011
211ftest	10010	0 -1	0.400	0.379/0.000	0.536/0.016	0.889	0.000/0.000
212ftest	10010	0 -1	0.250	0.276/0.000	0.503/0.104	0.444	0.052/0.044
213ftest	10010	0 -1	0.200	0.212/0.000	0.179/0.011	0.711	3.254/0.058
214ftest	10010	0 -1	0.000	0.000/0.000	0.056/0.053	0.111	0.526/0.027
215ftest	10010	0 -1	0.250	0.239/0.000	0.376/0.012	0.978	0.000/0.000
216ftest	10010	0 -1	0.150	0.158/0.000	0.465/0.178	0.578	0.799/0.014
217ftest	10010	0 -1	0.700	0.781/0.000	0.988/0.026	0.956	0.923/0.018
218ftest	10010	0 -1	0.750	0.833/0.000	1.033/0.021	1.000	0.569/0.018
219ftest	10010	0 -1	0.200	0.219/0.000	0.323/0.012	0.867	0.210/0.014
220ftest	10010	0 -1	0.000	0.047/0.000	0.611/0.312	0.089	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
221ftest	10010	0 -1 0.600	0.595/0.000	0.895/0.047	0.778	1.529/0.026	2.088/1.530
222ftest	10010	0 -1 0.000	0.027/0.000	0.101/0.069	0.133	1.898/0.033	0.000/0.000
223ftest	10010	0 -1 0.150	0.179/0.000	0.196/0.003	1.000	0.000/0.000	0.405/0.299
224ftest	10010	0 -1 0.850	0.934/0.000	1.197/0.069	0.689	1.020/0.027	2.256/0.808
225ftest	10010	0 -1 0.100	0.144/0.000	0.134/0.038	0.378	1.477/0.028	0.000/0.000
226ftest	10010	0 -1 0.400	0.395/0.000	0.551/0.013	0.978	0.602/0.014	1.376/1.007
227ftest	10010	0 -1 0.250	0.264/0.000	0.401/0.052	0.644	2.527/0.031	0.948/0.617
228ftest	10010	0 -1 0.750	0.850/0.000	1.022/0.019	1.000	1.204/0.015	1.789/0.728
229ftest	10010	0 -1 0.750	0.863/0.000	0.979/0.026	0.956	2.139/0.029	1.672/0.747
230ftest	10010	0 -1 0.150	0.183/0.000	0.247/0.082	0.333	0.000/0.000	0.000/0.000
231ftest	10010	0 -1 0.000	0.033/0.000	0.233/0.098	0.111	1.751/0.027	0.000/0.000
232ftest	10010	0 -1 0.150	0.194/0.000	0.765/0.348	0.444	0.000/0.000	0.000/0.000
233ftest	10010	0 -1 0.000	0.036/0.000	0.169/0.083	0.022	6.323/0.062	0.000/0.000
234ftest	10010	0 -1 0.150	0.207/0.000	0.602/0.172	0.222	3.787/0.041	0.000/0.000
235ftest	10010	0 -1 0.000	0.000/0.000	0.386/0.187	0.089	1.231/0.021	0.000/0.000
236ftest	10010	0 -1 0.100	0.194/0.000	0.813/0.361	0.222	2.111/0.042	0.000/0.000
237ftest	10010	0 -1 0.100	0.098/0.000	0.137/0.003	1.000	0.000/0.000	0.213/0.087
238ftest	10010	0 -1 0.700	0.775/0.000	0.970/0.025	0.933	1.424/0.027	1.851/1.037
239ftest	10010	0 -1 0.600	0.717/0.000	1.223/0.286	0.556	1.078/0.018	0.000/0.000
240ftest	10010	0 -1 0.550	0.650/0.000	0.771/0.035	0.911	3.224/0.042	0.000/0.000
241ftest	10011	0 -1 0.200	0.213/0.000	0.297/0.020	0.622	2.142/0.027	3.083/2.586
242ftest	10011	0 -1 0.000	0.000/0.000	0.137/0.127	0.044	0.000/0.000	1.618/1.806
243ftest	10011	0 -1 1.350	1.373/0.000	1.806/0.053	0.911	1.694/0.026	3.322/1.782
244ftest	10011	0 -1 0.950	0.960/0.000	1.600/0.223	0.644	2.805/0.049	0.000/0.000
245ftest	10011	0 -1 0.000	0.047/0.000	0.034/0.018	0.178	1.137/0.035	2.131/2.375
246ftest	10011	0 -1 1.250	1.263/0.000	1.727/0.068	0.844	1.363/0.022	3.556/1.780
247ftest	10011	0 -1 1.150	1.248/0.000	1.764/0.115	0.667	0.000/0.000	0.000/0.000
248ftest	10011	0 -1 1.300	1.367/0.000	2.324/0.311	0.356	1.289/0.038	0.000/0.000
249ftest	10011	0 -1 1.550	1.680/0.000	2.072/0.065	0.889	5.834/0.081	3.511/1.632
250ftest	10011	0 -1 0.000	0.093/0.000	0.110/0.020	0.356	2.253/0.028	2.761/2.667
251ftest	10011	0 -1 1.150	1.246/0.000	1.714/0.072	0.822	3.369/0.049	2.844/1.947
252ftest	10011	0 -1 1.350	1.397/0.000	1.557/0.043	0.978	1.671/0.026	2.078/0.895
253ftest	10011	0 -1 1.500	1.559/0.000	2.007/0.065	0.911	3.287/0.037	4.122/2.290
254ftest	10011	0 -1 1.650	1.682/0.000	2.190/0.069	0.956	3.600/0.039	3.867/1.394
255ftest	10011	0 -1 0.950	1.023/0.000	1.473/0.115	0.600	0.184/0.032	3.356/1.830
256ftest	10011	0 -1 0.950	1.009/0.000	1.584/0.210	0.578	1.946/0.021	2.789/1.774
257ftest	10011	0 -1 1.300	1.357/0.000	1.786/0.062	0.911	3.117/0.041	3.933/1.826
258ftest	10011	0 -1 1.100	1.165/0.000	1.519/0.057	0.822	1.756/0.030	3.311/1.977
259ftest	10011	0 -1 0.000	0.063/0.000	0.161/0.074	0.133	2.358/0.047	0.000/0.000
260ftest	10011	0 -1 1.200	1.223/0.000	1.867/0.224	0.667	2.128/0.025	3.400/1.715
261ftest	10011	0 -1 0.250	0.253/0.000	0.325/0.003	1.000	0.607/0.027	0.000/0.000
262ftest	10011	0 -1 0.150	0.183/0.000	0.255/0.027	0.600	0.901/0.034	0.000/0.000
263ftest	10011	0 -1 1.150	1.194/0.000	1.906/0.143	0.644	3.892/0.049	4.178/3.286
264ftest	10011	0 -1 1.150	1.211/0.000	1.938/0.327	0.600	0.000/0.000	4.300/2.404
265ftest	10011	0 -1 1.650	1.618/0.000	2.723/0.495	0.644	1.212/0.052	4.378/2.476
266ftest	10011	0 -1 1.000	1.070/0.000	1.399/0.061	0.778	1.884/0.034	2.889/1.624
267ftest	10011	0 -1 1.200	1.188/0.000	2.008/0.330	0.667	1.707/0.023	3.867/2.623
268ftest	10011	0 -1 0.350	0.483/0.000	0.772/0.093	0.489	2.204/0.031	2.508/2.184
269ftest	10011	0 -1 1.000	1.058/0.000	1.443/0.060	0.956	2.804/0.031	0.000/0.000
270ftest	10011	0 -1 1.700	1.756/0.000	2.283/0.080	0.867	3.493/0.041	4.500/2.315
271ftest	10011	0 -1 0.950	0.958/0.000	1.317/0.056	0.844	3.349/0.051	2.889/1.905
272ftest	10011	0 -1 1.050	1.099/0.000	1.606/0.096	0.733	2.783/0.034	3.356/1.955
273ftest	10011	0 -1 0.700	0.797/0.000	1.064/0.034	0.933	2.482/0.028	3.111/2.293
274ftest	10011	0 -1 0.000	0.026/0.000	0.205/0.090	0.244	2.047/0.022	2.073/1.922
275ftest	10011	0 -1 1.100	1.152/0.000	1.301/0.019	1.000	1.050/0.031	1.733/0.770

1260	Scenario	Known		MLR	N-NET	N-NET(id)	PCR	PA	
276ftest	10011	0	-1	1.050	1.113/0.000	1.409/0.034	0.978	1.918/0.034	3.511/2.264
277ftest	10011	0	-1	1.550	1.656/0.000	2.165/0.130	0.756	2.584/0.030	3.744/1.452
278ftest	10011	0	-1	1.400	1.490/0.000	1.898/0.058	0.889	2.299/0.048	4.300/2.625
279ftest	10011	0	-1	1.600	1.585/0.000	2.048/0.073	0.867	0.835/0.025	3.478/1.846
280ftest	10011	0	-1	0.000	0.041/0.000	0.406/0.154	0.156	1.957/0.029	0.000/0.000
281ftest	10100	0	-1	0.000	0.000/0.000	0.238/0.103	0.244	2.138/0.032	0.360/0.384
282ftest	10100	0	-1	0.000	0.050/0.000	0.116/0.073	0.111	0.883/0.013	0.000/0.000
283ftest	10100	0	-1	0.000	0.042/0.000	0.000/0.000	0.111	2.570/0.031	0.000/0.000
284ftest	10100	0	-1	0.600	0.709/0.000	0.982/0.136	0.667	0.000/0.000	0.000/0.000
285ftest	10100	0	-1	0.200	0.363/0.000	0.580/0.160	0.289	1.044/0.044	0.000/0.000
286ftest	10100	0	-1	0.000	0.096/0.000	0.792/0.334	0.089	0.000/0.000	0.000/0.000
287ftest	10100	0	-1	0.150	0.158/0.000	0.194/0.005	0.889	1.565/0.018	0.000/0.000
288ftest	10100	0	-1	0.000	0.028/0.000	0.083/0.075	0.156	0.300/0.012	0.000/0.000
289ftest	10100	0	-1	0.000	0.000/0.000	0.154/0.057	0.133	1.537/0.025	0.000/0.000
290ftest	10100	0	-1	0.000	0.000/0.000	0.216/0.114	0.178	1.888/0.018	0.000/0.000
291ftest	10100	0	-1	0.000	0.000/0.000	0.042/0.040	0.156	2.857/0.037	0.000/0.000
292ftest	10100	0	-1	0.000	0.082/0.000	0.173/0.035	0.289	0.986/0.018	1.213/1.013
293ftest	10100	0	-1	0.000	0.000/0.000	0.119/0.059	0.133	2.533/0.039	0.000/0.000
294ftest	10100	0	-1	0.250	0.293/0.000	0.800/0.196	0.356	0.856/0.018	0.000/0.000
295ftest	10100	0	-1	0.000	0.000/0.000	0.178/0.082	0.200	0.000/0.000	0.000/0.000
296ftest	10100	0	-1	0.000	0.038/0.000	0.167/0.084	0.178	0.492/0.020	0.000/0.000
297ftest	10100	0	-1	0.150	0.194/0.000	0.531/0.188	0.356	0.110/0.014	0.000/0.000
298ftest	10100	0	-1	0.000	0.034/0.000	0.114/0.075	0.044	1.316/0.022	0.000/0.000
299ftest	10100	0	-1	0.000	0.027/0.000	0.338/0.098	0.178	0.104/0.015	0.000/0.000
300ftest	10100	0	-1	0.550	0.665/0.000	0.833/0.089	0.622	0.000/0.000	0.897/0.277
301ftest	10100	0	-1	0.000	0.033/0.000	0.105/0.077	0.022	1.992/0.028	0.723/0.761
302ftest	10100	0	-1	0.000	0.000/0.000	0.000/0.000	0.244	3.073/0.032	0.154/0.175
303ftest	10100	0	-1	0.000	0.038/0.000	0.487/0.216	0.178	1.235/0.022	0.000/0.000
304ftest	10100	0	-1	0.000	0.025/0.000	0.110/0.068	0.089	1.975/0.039	0.000/0.000
305ftest	10100	0	-1	0.000	0.026/0.000	0.111/0.027	0.222	2.218/0.044	0.000/0.000
306ftest	10100	0	-1	0.650	0.762/0.000	0.845/0.032	0.889	1.421/0.016	0.000/0.000
307ftest	10100	0	-1	0.100	0.095/0.000	0.137/0.003	0.978	0.000/0.000	0.000/0.000
308ftest	10100	0	-1	0.000	0.000/0.000	0.000/0.000	0.133	1.539/0.022	0.154/0.177
309ftest	10100	0	-1	0.150	0.164/0.000	0.200/0.022	0.689	2.399/0.024	0.201/0.019
310ftest	10100	0	-1	0.050	0.052/0.000	0.067/0.002	0.978	0.082/0.009	0.000/0.000
311ftest	10100	0	-1	0.000	0.000/0.000	0.284/0.090	0.200	2.918/0.036	0.000/0.000
312ftest	10100	0	-1	0.700	0.758/0.000	0.862/0.010	1.000	2.829/0.032	0.000/0.000
313ftest	10100	0	-1	0.850	0.869/0.000	0.971/0.021	1.000	2.591/0.027	1.068/0.117
314ftest	10100	0	-1	0.000	0.000/0.000	0.102/0.024	0.267	2.773/0.026	0.000/0.000
315ftest	10100	0	-1	0.750	0.834/0.000	1.788/0.314	0.356	2.955/0.029	0.000/0.000
316ftest	10100	0	-1	0.700	0.770/0.000	1.233/0.162	0.356	5.043/0.049	0.000/0.000
317ftest	10100	0	-1	0.000	0.036/0.000	0.735/0.386	0.089	2.907/0.028	0.000/0.000
318ftest	10100	0	-1	0.000	0.000/0.000	0.164/0.040	0.267	1.626/0.019	1.150/1.469
319ftest	10100	0	-1	0.000	0.105/0.000	0.228/0.129	0.133	4.922/0.056	0.000/0.000
320ftest	10100	0	-1	0.000	0.000/0.000	0.199/0.163	0.111	0.678/0.031	0.000/0.000
321ftest	10101	0	-1	1.050	1.108/0.000	1.300/0.063	0.822	1.596/0.018	1.350/0.102
322ftest	10101	0	-1	0.000	0.000/0.000	0.495/0.446	0.067	5.804/0.055	2.323/2.107
323ftest	10101	0	-1	0.000	0.000/0.000	0.000/0.000	0.111	0.056/0.016	0.000/0.000
324ftest	10101	0	-1	0.000	0.035/0.000	0.819/0.420	0.222	0.000/0.000	1.991/1.866
325ftest	10101	0	-1	0.000	0.042/0.000	0.432/0.095	0.311	0.771/0.011	0.000/0.000
326ftest	10101	0	-1	0.000	0.000/0.000	0.000/0.000	0.156	2.587/0.059	0.000/0.000
327ftest	10101	0	-1	0.000	0.000/0.000	0.078/0.062	0.067	0.408/0.019	0.000/0.000
328ftest	10101	0	-1	0.000	0.000/0.000	0.225/0.098	0.111	0.926/0.014	0.000/0.000
329ftest	10101	0	-1	1.350	1.385/0.000	1.570/0.037	1.000	3.480/0.042	1.833/0.625
330ftest	10101	0	-1	0.000	0.000/0.000	0.062/0.047	0.178	0.000/0.000	1.030/1.502

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
331ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.067	0.000/0.000	0.000/0.000
332ftest	10101	0 -1 0.000	0.066/0.000	0.517/0.202	0.067	0.904/0.046	0.000/0.000
333ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.038/0.013	0.000/0.000
334ftest	10101	0 -1 0.000	0.044/0.000	0.198/0.056	0.178	1.873/0.031	0.000/0.000
335ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
336ftest	10101	0 -1 0.000	0.000/0.000	0.147/0.052	0.200	0.000/0.000	1.553/1.411
337ftest	10101	0 -1 0.000	0.074/0.000	0.290/0.058	0.244	3.234/0.055	0.000/0.000
338ftest	10101	0 -1 1.200	1.219/0.000	1.356/0.018	1.000	0.951/0.011	1.490/0.104
339ftest	10101	0 -1 0.000	0.000/0.000	0.200/0.140	0.133	0.377/0.016	0.000/0.000
340ftest	10101	0 -1 1.400	1.505/0.000	1.720/0.046	0.956	3.235/0.038	1.825/0.139
341ftest	10101	0 -1 1.200	1.213/0.000	1.410/0.015	1.000	1.287/0.017	1.550/0.081
342ftest	10101	0 -1 1.550	1.649/0.000	1.902/0.044	0.978	3.640/0.037	0.000/0.000
343ftest	10101	0 -1 0.000	0.000/0.000	0.042/0.006	0.311	0.098/0.016	1.827/1.730
344ftest	10101	0 -1 0.000	0.000/0.000	0.045/0.038	0.156	1.288/0.027	0.000/0.000
345ftest	10101	0 -1 1.050	1.102/0.000	1.278/0.044	0.956	2.795/0.033	1.489/0.443
346ftest	10101	0 -1 0.000	0.105/0.000	0.280/0.099	0.156	0.433/0.027	0.000/0.000
347ftest	10101	0 -1 0.000	0.047/0.000	0.395/0.139	0.089	3.966/0.053	0.000/0.000
348ftest	10101	0 -1 1.300	1.382/0.000	1.529/0.025	1.000	2.950/0.042	1.680/0.244
349ftest	10101	0 -1 0.000	0.000/0.000	0.228/0.106	0.156	0.000/0.000	0.000/0.000
350ftest	10101	0 -1 0.000	0.000/0.000	0.353/0.079	0.289	1.330/0.022	1.613/1.424
351ftest	10101	0 -1 0.000	0.000/0.000	0.335/0.153	0.200	0.404/0.011	0.000/0.000
352ftest	10101	0 -1 0.000	0.000/0.000	0.116/0.039	0.244	0.497/0.024	0.000/0.000
353ftest	10101	0 -1 1.200	1.238/0.000	1.428/0.025	0.956	3.564/0.037	0.000/0.000
354ftest	10101	0 -1 0.000	0.052/0.000	0.094/0.035	0.244	1.664/0.033	0.000/0.000
355ftest	10101	0 -1 0.000	0.000/0.000	0.125/0.039	0.222	0.117/0.016	1.970/1.826
356ftest	10101	0 -1 1.550	1.656/0.000	1.929/0.051	0.978	2.521/0.035	0.000/0.000
357ftest	10101	0 -1 1.100	1.149/0.000	1.309/0.021	1.000	0.940/0.021	0.000/0.000
358ftest	10101	0 -1 0.000	0.000/0.000	0.077/0.015	0.356	0.230/0.011	2.169/2.207
359ftest	10101	0 -1 0.000	0.000/0.000	0.000/0.000	0.089	0.072/0.013	0.000/0.000
360ftest	10101	0 -1 0.000	0.000/0.000	0.289/0.219	0.089	0.000/0.000	0.000/0.000
361ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
362ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
363ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
364ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
365ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
366ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
367ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
368ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
369ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
370ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
371ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
372ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
373ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
374ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
375ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
376ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
377ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
378ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
379ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
380ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
381ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
382ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
383ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
384ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
385ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000

1260	Scenario	Known	MLR	N-NET	N-NET(id)	PCR	PA
386ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
387ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
388ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
389ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
390ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
391ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
392ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
393ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
394ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
395ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
396ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
397ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
398ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
399ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000
400ftest	11000	0 -1 0.000	0.000/0.000	0.000/0.000	0.178	0.000/0.000	0.000/0.000

Appendix I: Scenario Identification Rules

Scenario Identification Rules have fifteen numerical antecedents, called the opinion pattern, and ten scenario frequencies. The values of the numerical antecedents translate as follows

- 1: BDL
- 2: WDL
- 3: ADL
- 4: Maybe
- 5: Yes
- 6: No

Rule #	Opinion Pattern	$C_0N_0S_0$	$C_0N_0S_0$	$C_0N_0S_1$	$C_0N_0S_1$	$C_0N_1S_0$	$C_1N_0S_0$	$C_1N_0S_0$	$C_1N_0S_1$	$C_1N_0S_1$	$C_1N_1S_0$
		M_1O_0	M_1O_1	M_0O_0	M_0O_1	M_0O_0	M_1O_0	M_1O_1	M_0O_0	M_0O_1	M_0O_0
1	122262222522225	1	0	0	0	0	0	0	0	0	0
2	222252223523335	1	0	0	0	0	0	0	0	0	0
3	221252222522225	2	0	0	0	0	0	0	0	0	0
4	222252223522235	1	0	0	0	0	0	0	0	0	0
5	111162222522235	2	0	0	0	0	0	0	0	0	0
6	122362223522235	1	0	0	0	0	0	0	0	0	0
7	221342223523335	1	0	0	0	0	0	0	0	0	0
8	222252222522225	1	0	0	0	0	0	0	0	0	0
9	222352223523335	2	0	0	0	0	0	0	0	0	0
10	112362223523335	2	0	0	0	0	0	0	0	0	0
11	222352333523335	1	0	0	0	0	0	0	0	0	0
12	122362223533235	1	0	0	0	0	0	0	0	0	0
13	222342223522235	1	0	0	0	0	0	0	0	0	0
14	112362223522235	1	0	0	0	0	0	0	0	0	0
15	112262222522225	1	0	0	0	0	0	0	0	0	0
16	111262221522225	1	0	0	0	0	0	0	0	0	0
17	122262211633335	0	1	0	0	0	0	0	0	0	0
18	122362333533334	0	1	0	0	0	0	0	0	0	0
19	122363223533335	0	1	0	0	0	0	0	0	0	0
20	221353333533335	0	1	0	0	0	0	0	0	0	0
21	122363333533335	0	2	0	0	0	0	0	0	0	0
22	332353333533335	0	2	0	0	0	0	0	0	0	0
23	333343333533335	0	1	0	0	0	0	0	0	0	0
24	122262211433335	0	1	0	0	0	0	0	0	0	0
25	322353333533335	0	1	0	0	0	0	0	0	0	0
26	112162222533335	0	1	0	0	0	0	0	0	0	0
27	111163333533335	0	1	0	0	0	0	0	0	0	0
28	121163333533335	0	1	0	0	0	0	0	0	0	0
29	122362223433335	0	1	0	0	0	0	0	0	0	0
30	122363333433335	0	1	0	0	0	0	0	0	0	0

Rule #	Opinion Pattern	$C_0N_0S_0$	$C_0N_0S_0$	$C_0N_0S_1$	$C_0N_0S_1$	$C_0N_1S_0$	$C_1N_0S_0$	$C_1N_0S_0$	$C_1N_0S_1$	$C_1N_0S_1$	$C_1N_1S_0$
		M_1O_0	M_1O_1	M_0O_0	M_0O_1	M_0O_0	M_1O_0	M_1O_1	M_0O_0	M_0O_1	M_0O_0
31	122363323533335	0	1	0	0	0	0	0	0	0	0
32	221162222533335	0	1	0	0	0	0	0	0	0	0
33	332343333533335	0	1	0	0	0	0	1	0	0	0
34	121162223533335	0	1	0	0	0	0	0	0	0	0
35	112161211622225	0	0	2	0	0	0	0	0	0	0
36	112161211422235	0	0	1	0	0	0	0	0	0	0
37	112161211422225	0	0	2	0	0	0	0	0	0	0
38	111261121623335	0	0	1	0	0	0	0	0	0	0
39	111161112622225	0	0	5	0	0	0	0	0	0	0
40	112261122622225	0	0	2	0	0	0	0	0	0	0
41	112261221622225	0	0	2	0	0	0	0	0	0	0
42	111161211622225	0	0	1	0	0	0	0	0	0	0
43	112261123622225	0	0	2	0	0	0	0	0	0	0
44	111151211623235	0	0	1	0	0	0	0	0	0	0
45	111261121622235	0	0	1	0	0	0	0	0	0	0
46	112161211633335	0	0	0	7	0	0	0	0	0	0
47	111361121633335	0	0	0	4	0	0	0	0	0	0
48	112162211633335	0	0	0	1	0	0	0	0	0	0
49	122361223633335	0	0	0	1	0	0	0	0	1	0
50	122341223633335	0	0	0	2	0	0	0	0	0	0
51	111261121633335	0	0	0	3	0	0	0	0	0	0
52	121161221633335	0	0	0	1	0	0	0	0	1	0
53	111161112633335	0	0	0	1	0	0	0	0	0	0
54	111161111611116	0	0	0	0	20	0	0	0	0	20
55	123362223423334	0	0	0	0	0	1	0	0	0	0
56	231362331633314	0	0	0	0	0	1	0	0	0	0
57	223352233523115	0	0	0	0	0	1	0	0	0	0
58	122262213522335	0	0	0	0	0	1	0	0	0	0
59	221162331423324	0	0	0	0	0	1	0	0	0	0
60	222162313433336	0	0	0	0	0	1	0	0	0	0
61	221152312433335	0	0	0	0	0	1	0	0	0	0
62	221142333433234	0	0	0	0	0	1	0	0	0	0
63	231342323623334	0	0	0	0	0	1	0	0	0	0
64	222142313433134	0	0	0	0	0	1	0	0	0	0
65	222162321623334	0	0	0	0	0	1	0	0	0	0
66	223342313423314	0	0	0	0	0	1	0	0	0	0
67	221152321623335	0	0	0	0	0	1	0	0	0	0
68	221142231623134	0	0	0	0	0	1	0	0	0	0
69	232342323423336	0	0	0	0	0	1	0	0	0	0
70	111162221522325	0	0	0	0	0	1	0	0	0	0
71	221352331523335	0	0	0	0	0	1	0	0	0	0
72	132162313423214	0	0	0	0	0	1	0	0	0	0
73	123162211423334	0	0	0	0	0	1	0	0	0	0
74	221162231423316	0	0	0	0	0	1	0	0	0	0
75	212163333533335	0	0	0	0	0	0	1	0	0	0
76	231163331433334	0	0	0	0	0	0	1	0	0	0
77	121363313533335	0	0	0	0	0	0	1	0	0	0
78	221163333433334	0	0	0	0	0	0	1	0	0	0
79	221363323533335	0	0	0	0	0	0	1	0	0	0
80	221163333533335	0	0	0	0	0	0	1	0	0	0

[illegible]