

Spokane Community College

Placement Testing Outcomes Analyses

For Reading, Writing, and Mathematics

**An examination of student outcomes in developmental education
based on Asset and Compass placement recommendations and
students' choices of course progression.**

**A. Mark Macias
SCC Director of Institutional Research**

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Pathway analysis of student progression through developmental courses based on the recommended placements resulting from Asset and Compass test scores

Pathway analysis is a descriptive analytical tool used to examine patterns in sequential or time-linked events. In the present application, pathway analysis was used to explore mathematics and English developmental course-taking patterns by students at SCC.

Methodology

Pathway analysis was conducted on cohorts of first-time SCC students with a declared intent of seeking an associate of arts degree. Cohorts were established based on the following criteria:

1) **First-time SCC student during the 2004-05 academic year**

Source Code = 2 or 4,

where 2 indicated a transfer from another college and 4 indicated the student has never attended this or any other college

State Start = 1 or 2,

where 1 indicates a first state enrollment for the student, or the first non-summer state enrollment for a former running start student, and 2 indicates a first state enrollment following a period of 7 or more years. State-Start = 1 includes running start students

YRQ Actual Start = A451 to A454,

The academic year 2004-05 was used as the starting point for the analysis in order to allow students roughly two academic years to progress through the developmental courses. Transcript records were searched through spring quarter 2006 for developmental course activity.

2) **Seeking Liberal Arts Degree**

Intent Code = A or B,

where A indicates intent to earn an Academic Non-Transfer Degree and B indicates intent to earn an Academic Transfer Degree.

3) **Possessed Valid Placement Test Scores for Reading, Writing, and Mathematics**

The student possessed Asset and/or Compass placement test scores in the Student Management System (SMS) Test Score file assessing reading, writing, and mathematics skill levels.

4) **Running Start Students**

In addition to the above, ***Running Start Status = 1 or Null***

where 1 indicates student is currently enrolled under the running start program, Null indicates the student is not a running start student.

Five primary cohorts were established based on the above criteria: 1) non-running start reading, 2) non-running start writing, 3) non-running start mathematics, 4) running start English, and 5) running start mathematics. Within each primary cohort, students were further classified into sub-groups based on the recommended course placement derived from their Asset and Compass test scores. (For example, the reading test cut-off scores yield three placement recommendations: English 94, English 96, and English 101.) Students within each of these subgroups were then tracked through successive quarters through spring 2006 noting the English and Math courses taken, whether they passed the class or not, and the sequence in which the classes were taken. A passing grade was considered to be 2.0 or higher, or a "P" in pass/fail classes. The combinations of these course sequences and pass/fail conditions define a pathway, with each course and pass/fail condition representing a step along that pathway (see attached charts).

The number of students that passed through each unique step was tabulated and charted. Tracking stopped (i.e., a pathway ended) once a certain end-point condition was met. In the case of reading and writing, successfully completing English 101 was an end-point, and in mathematics, Math 99 was an end-point. These two classes represent milestones that all liberal arts students requiring developmental training must pass in order to progress to their college-level classes and earn their degrees. In many

cases, the students' paths just stop—they take no more English or Math classes in the series. In the charts, this pathway termination is denoted as “No More English” or “No More Math.”

For reading and writing placement, Asset and Compass scores were evaluated together since the decision rules are very similar even though the cut-off scores are different. Math rules, however, are more complicated, and at the recommendation of SCC counselors, Asset and Compass math scores were evaluated separately. The cohort size resulting from Compass math placement was so low (two students) that was excluded from further processing.

If a placement score indicates the student is “college ready” they are permitted (although not required) to enroll directly in the end-point class (English 101 or Math 99) or higher. If the student opts to enroll in a college-level class higher than the end-point classes, they do not appear in the analysis unless they subsequently enroll in a developmental class.

Limitations of Pathway Analysis

The most important limitation to bear in mind is that pathway analysis is a descriptive tool—it helps to illuminate patterns that are not otherwise discernable in complex time-linked data. Once patterns are detected, they can then be further explored. In the present application, there are several additional limitations.

- 1) While the pathways of reading and writing developmental course-taking were examined separately, in reality students take these courses at the same time such that the pathways are intermingled. Because this makes the pathways substantially more complex, the decision was made to first look at these separately. To accomplish this segregation, writing developmental courses were specifically excluded from the reading pathways, and visa versa.
- 2) While the charts denote end-points as, say, “No more English,” this only means that the student took no more English classes in the reading or writing remedial series through spring 2006 (although it is possible the student took English classes not in the remedial series). Nor does this end-point indicate that the student has dropped out or stopped out of college altogether—it merely indicates that as of spring 2006 they took no more classes in the series.

While liberal arts students are advised to take their developmental courses sooner rather than later, and since they often can't progress into other courses until these requirements are met, there are still some students who delay the completion of these requirements. In addition, about 10% of the liberal arts cohort used in this analysis attended only part-time (fewer than 12 credits). For these reasons, some new students entering late in the 2004-05 academic year may not yet have had time to enroll in some of the developmental courses required.

- 3) Although the size of the starting cohort is large (nearly 400), the number of students who take certain paths can be very small—even as small as a single student in many branches. For this reason caution must be exercised in interpreting such details—the focus of this analysis is at the broader levels.

Results

The following tables were tabulated from the pathway charts. The format provides a convenient way to observe how the cohorts flowed through the major pathways and focuses on outcomes relative to the desired end-points.

A chart was created for each of the five primary cohorts. At the top of each table, the size of the cohort and the overall success rate are shown. The columns display the distribution of placements based on their test scores, and show the proportions that follow the recommended path or opt to take a different

path. Some students with lower placement scores opt to enroll directly in the end-point class, and these are also displayed. The bottom of each table shows the success rate of the placement sub-group.

Reading

Reading cohort of first-time freshmen
who are not running start students:
Eventually pass English 101:

380
70%

Recommended Placement:	English 94	English 96	English 101
Size of Sub-group:	56	90	234
Percentage of Initial Cohort:	15%	24%	61%
Take recommended class first:	77%	28%	92%
Pass recommended class:	91%	92%	81%
Go on to pass English 101:	46%	62%	----
Opt to take alternate path (inc. Eng 101):	23%	72%	08%
Go on to pass English 101:	62%	69%	53%
Opt to enroll directly in English 101:	16%	58%	----
Pass English 101:	78%	81%	----
% of Sub-group who pass English 101 regardless of the path taken:	45%	66%	79%

Writing

Writing cohort of first-time freshmen
who are not running start students:
Eventually pass English 101:

373
72%

Recommended Placement:	English 92/98*	English 97	English 99	English 101
Size of Sub-group:	27	48	64	234
Percentage of Initial Cohort:	7%	13%	17%	63%
Take recommended class first:	19%	65%	0%	93%
Pass recommended class:	100%	65%	0%	80%
Go on to pass English 101:	20%	50%	0%	----
Opt to take alternate path (inc. Eng 101):	81%	37%	100%	07%
Go on to pass English 101:	45%	82%	84%	31%
Opt to enroll directly in English 101:	07%	29%	89%	----
Pass English 101:	100%	93%	88%	----
% of Sub-group who pass English 101 regardless of the path taken:	41%	52%	84%	76%

* All students enrolled in English 98—none enrolled in English 92.

Additional findings of interest:

- Of the students placed into Eng 97 who actually take Eng 97, approximately 50% (17 out of 31) take no more English classes, whether they passed or not.
- None of the students placed into Eng 99 actually took Eng 99—the vast majority opted to take Eng 101 and performed very well.

Mathematics (Asset placement)

Math cohort of first-time freshmen
who are not running start students: 405
Eventually pass Math 99: 29%

	Math 20/21	Math 91	Math 96	Math 99	Test Again*
Recommended Placement:	147	158	69	18	13
Size of Sub-group:	36%	39%	17%	4%	3%
Percentage of Initial Cohort:					
Take recommended class first:	97%	73%	70%	94%	----
Pass recommended class:	78%	75%	73%	94%	----
Go on to pass Math 99:	11%	40%	38%	----	
Opt to take alternate path (inc. Math 99):	3%	27%	30%	6%	----
Go on to pass Math 99:	0%	60%	67%	0%	----
Opt to enroll directly in Math 99:	<1%	<1%%	20%	----	31%
Pass Math 99:	0%	0%	79%	----	100%
% of Sub-group who pass Math 99 regardless of the path taken:	8%	31%	48%	89%	38%

*Students whose scores were below minimum cut-offs and should have retaken the Asset test.

Running Start English

Running Start cohort of first-time freshmen: 68
Eventually pass English 101: 84%

	English 96	English 99	English 101
Recommended Placement:	1	2	65
Size of Sub-group:	1%	3%	96%
Percentage of Initial Cohort:			
Take recommended class first:	0%	0%	92%
Pass recommended class:	0%	0%	82%
Go on to pass English 101:	0%	0%	----
Opt to take alternate path (inc. Eng 101):	100%	100%	08%
Go on to pass English 101:	100%	100%	80%
Opt to enroll directly in English 101:	100%	100%	----
Pass English 101:	100%	100%	----
% of Sub-group who pass English 101 regardless of the path taken:	100%	100%	83%

Running Start Math

Running Start cohort of first-time freshmen: 12
Eventually pass English 101: 50%

Recommended Placement:	Math 96	Math 99	Test Again
Size of Sub-group:	6	5	1
Percentage of Initial Cohort:	50%	42%	8%
Take recommended class first:	67%	100%	----
Pass recommended class:	75%	60%	----
Go on to pass Math 99:	30%	----	----
Opt to take alternate path (inc Math 99):	33%	----	8%
Go on to pass Math 99:	100%	----	0%
Opt to enroll directly in Math 99:	33%	----	----
Pass Math 99:	100%	----	----
% of Sub-group who pass Math 99 regardless of the path taken:	50%	60%	0%

Additional findings of interest:

- Compared to the other cohorts, this group is quite small.

Observations

While the author attempts to interpret these data, note that he is not familiar with the content and learning objectives of the courses being investigated—only that, in general, students are expected to progress through the series until the end-points are achieved. The instructors and curriculum designers of the English and mathematics departments should be able make better sense of some of the patterns observed. The author does, however, make the following observations and interpretations based on his limited knowledge.

Reading

Students who enroll in the classes recommended by their placement scores tended to perform very well in those classes (91% pass English 94, 92% pass English 96, and 81% pass English 101), suggesting that the placement tests are correctly assessing the skill levels of these students relative to those classes. However, only 46% of the students who pass English 94, and only 62% of the students who pass English 96 go on to pass English 101, suggesting that these two classes may not be adequately preparing the students for the next levels in the series. Interestingly, while 77% of the students placed into English 94 actually take the class, only 28% of those placed into English 96 actually take the class—most of these students (58%) opt to take English 101 instead, and 81% of them passed it.

Writing

Students who enroll in the classes recommended by their placement scores tended to perform well in those classes (100% pass English 98, 62% pass English 97, and 80% pass English 101), with the exception of English 99—none of the students placed into this class actually took the class. The English department employs in-class writing assessments during the first two days of class each quarter, followed by “Switch Day” where the instructors recommend to some students that they switch to a class more appropriate for the assessed writing skill level. Switching is voluntary, but if a student does decide to change classes, the instructor assists the student in completing the necessary forms and helps the

student find the new class. This might explain why none of the students placed into English 99 actually took the class—the vast majority (89%) took English 101 and 88% passed it, suggesting that the cut-off scores for English 99 may need to be investigated.

Of the students placed into English 98 who actually took English 98, all passed the class, but alarmingly only 20% passed English 101. The vast majority of students placed into English 98 (81%) opted to take English 97, 99, or 101 instead, but only 45% went on to pass English 101. It must be noted, however, that these groups are fairly small and, as such, these results are highly subject to individual differences—i.e., this pattern may not be observed in cohorts from other years.

A finding not obvious in the tables above, but which is obvious in the charts, is that of the students placed into English 97 who actually took English 97, over half (55%) took no more development English classes whether they passed the class or not. The other 45% of these students all took English 101, 79% of whom passed.

Reading and Writing, in General

Based on their placement test scores, the bulk of new freshmen are placed into English 101 (61% for reading and 63% for writing). Most of them opt to take English 101 (92% and 93%, respectively) and most of them passed the class (79% and 76% respectively). In fact, overall, 70% of the reading cohort and 72% of the writing cohort went on to pass English 101 regardless of where they were initially placed and what path they took. These success rates are consistent with U.S. Dept of Education statistics showing the national average pass rate for all college-level classes at all institutions being around 75%.

Further investigation of cut-off scores and, possibly, curriculum may be warranted for English 97 and English 99. Additionally, it is troubling that once the lower-level classes are passed, students appear to struggle to pass English 101. It should be emphasized again, however, that some of the sub-group sizes are small and these results may not replicate.

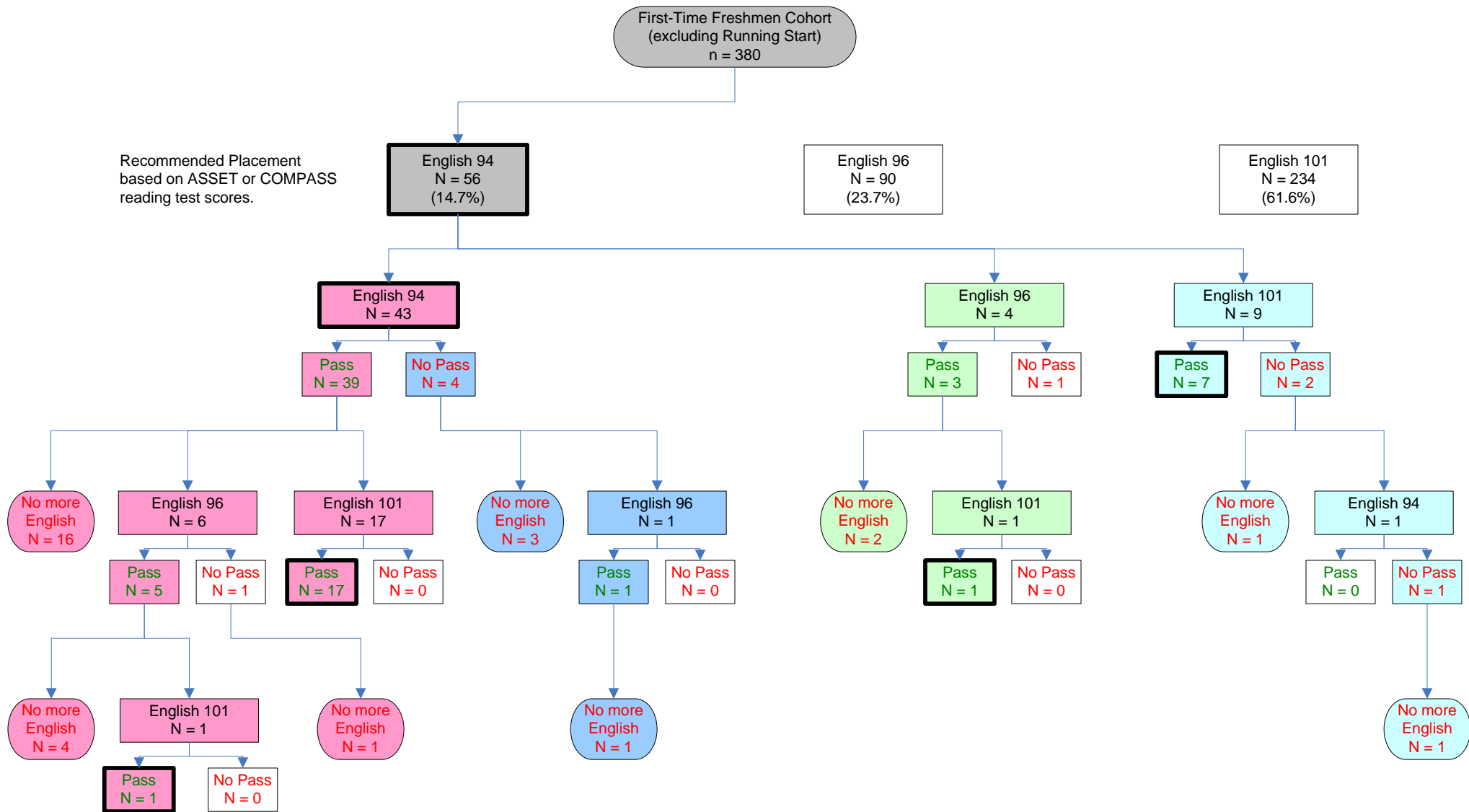
Math

While more than 60% of new freshmen are placed into the English end-point class (English 101), only 4% are placed into the math end-point class (Math 99). Instead, 75% are distributed across Math 20/21 and Math 91. Similar to the reading cohort, students who are placed into a class and who then actually take that class, perform fairly well with anywhere from 73% to 94% passing the class, but very few then go on to pass Math 99. In fact, overall, only 29% of this cohort go on to pass Math 99, regardless of placement and the paths they took. Again, this suggests that the placement exams appear to be accurately placing the students into the appropriate classes, but the classes themselves may not adequately prepare the students to progress through the series.

A small percentage of this cohort (3%) tested below the minimum cut-off scores for placement into any math class and, according to counseling faculty, should have been required to retake the math placement exams but instead enrolled in classes. The author found no evidence that these students ever did retest. Nearly 40% of these students, however, were able to eventually pass Math 99.

Running Start

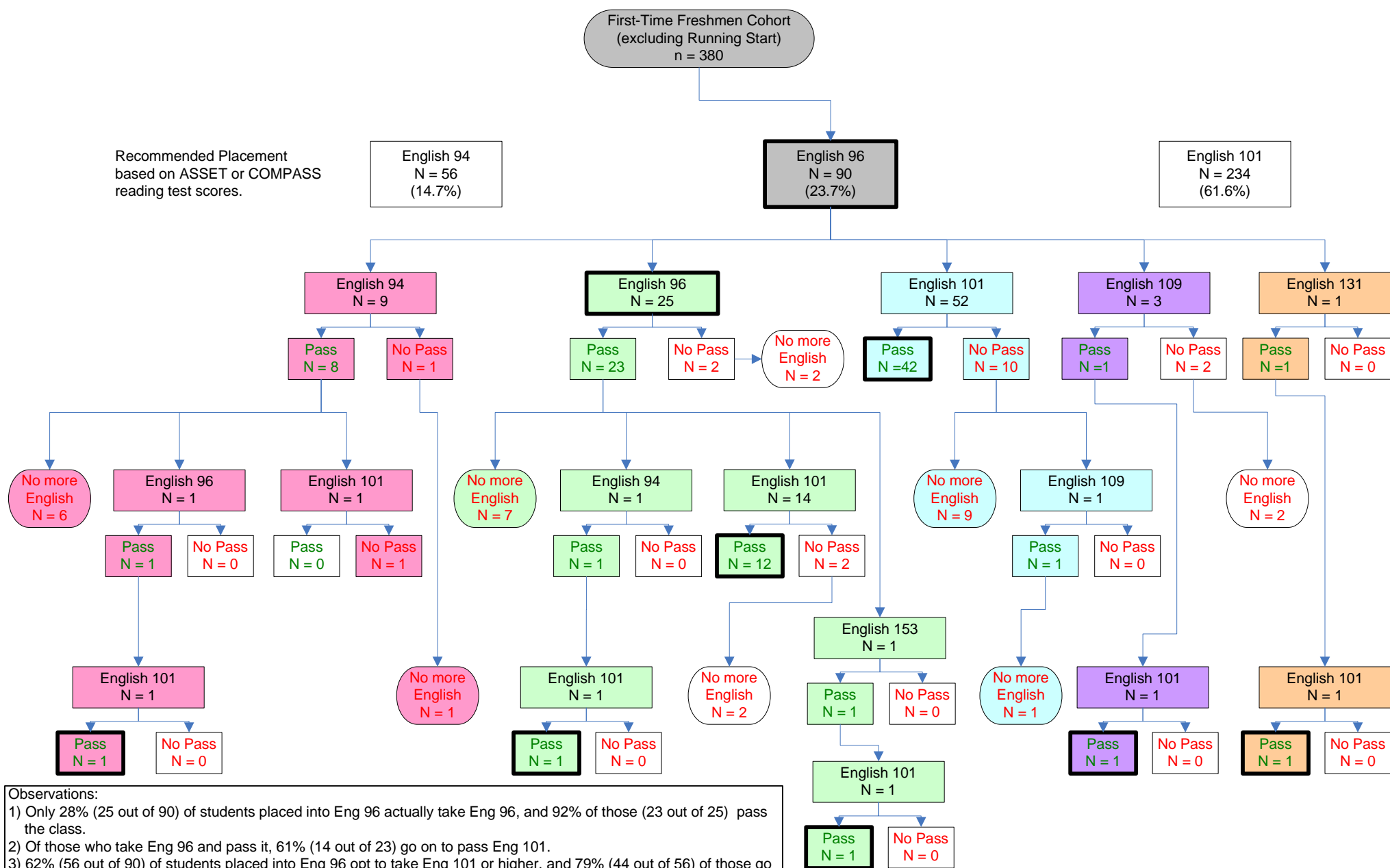
The vast majority (96%) of new running start students are placed into English 101. Most of these students (92%) choose to take English 101, and most of them (82%) pass the class. The running start math cohort was very small—only 12 students. After a discussion with math faculty, it was hypothesized that most of the running start students were assessed for placement higher than Math 99 and therefore did not appear in the cohort for this analysis. (Of the 12 students that did appear in the cohort, only 50% were able to eventually pass Math 99.) This requires further investigation, but if true, suggests that running start students are better prepared for college-level math than they are reading and writing.



Observations:

- 1) 77% (43 out of 56) of students placed into Eng 94 actually take Eng 94, and 91% (39 out of 43) of those pass the class.
- 2) Of those who take Eng 94 and pass it, only 46% (18 out of 39) go on to pass Eng 101.
- 3) Only 46% (26 out of 56) of students placed into Eng 94 go on to pass Eng 101, regardless of the path they take.

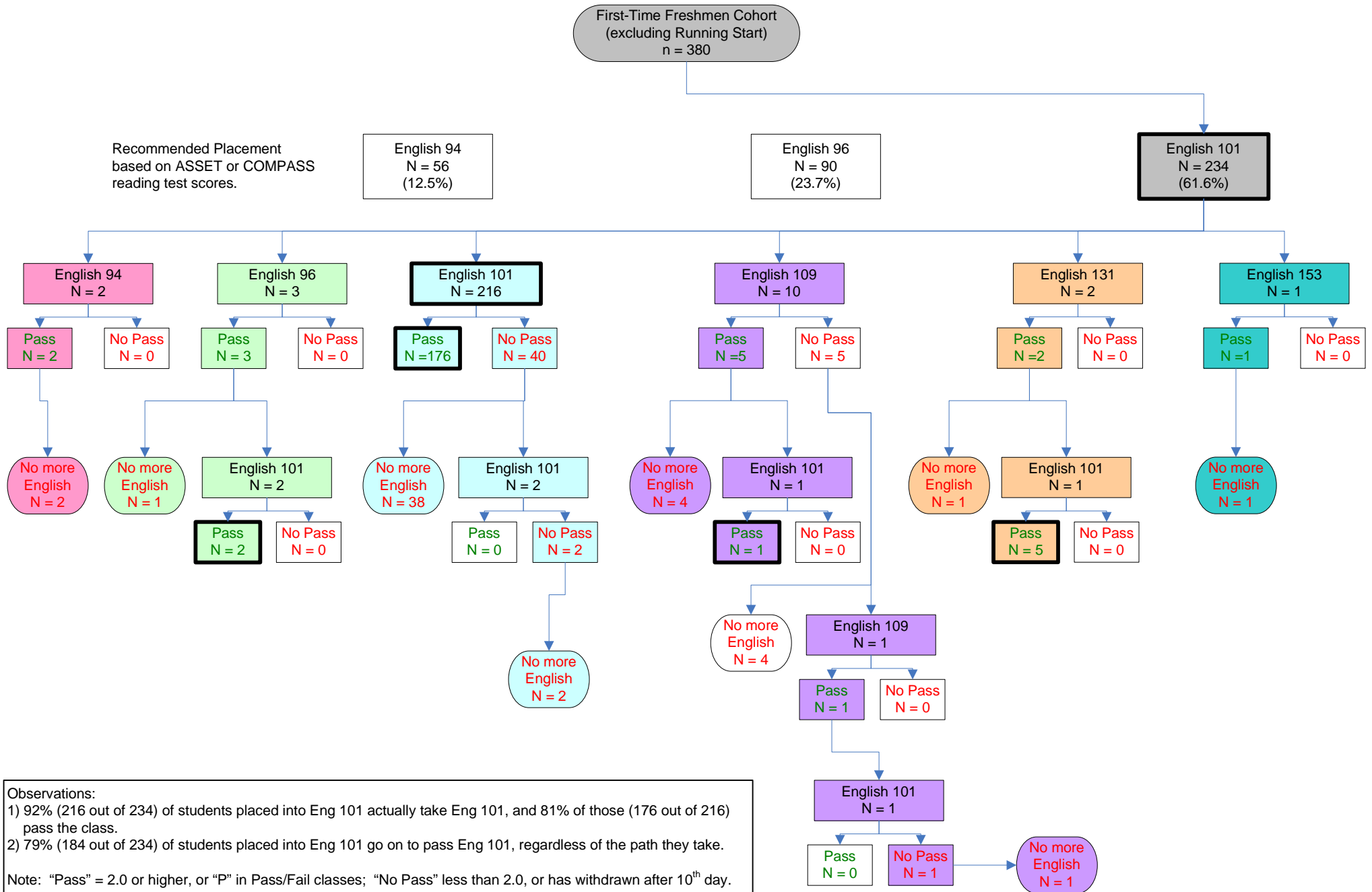
Note: "Pass" = 2.0 or higher, or "P" in Pass/Fail classes; "No Pass" less than 2.0, or has withdrawn after 10th day.

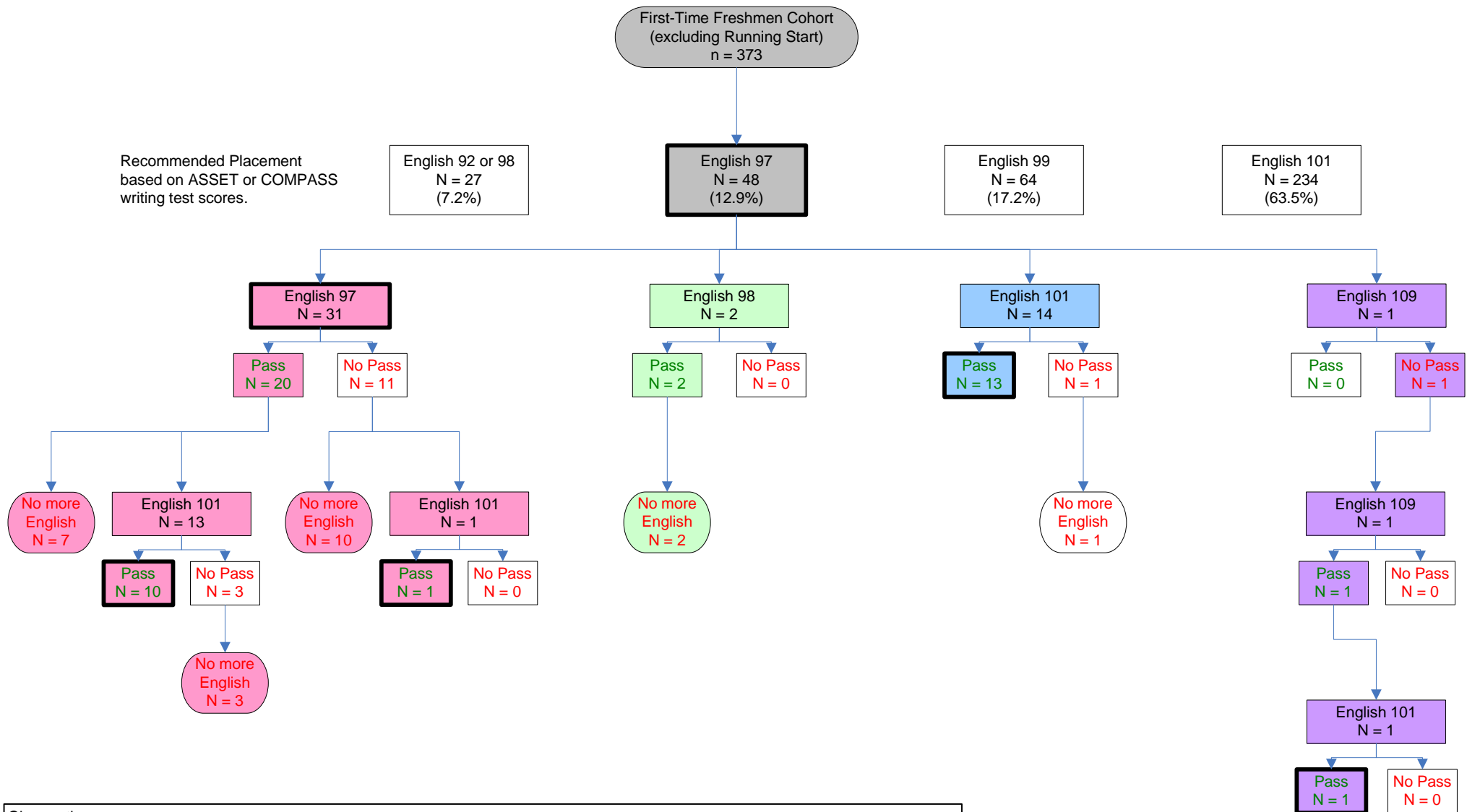


Observations:

- 1) Only 28% (25 out of 90) of students placed into Eng 96 actually take Eng 96, and 92% of those (23 out of 25) pass the class.
- 2) Of those who take Eng 96 and pass it, 61% (14 out of 23) go on to pass Eng 101.
- 3) 62% (56 out of 90) of students placed into Eng 96 opt to take Eng 101 or higher, and 79% (44 out of 56) of those go on to pass Eng 101.
- 4) 66% (59 out of 90) of students placed into Eng 96 go on to pass Eng 101, regardless of the path they take.

Note: "Pass" = 2.0 or higher, or "P" in Pass/Fail classes; "No Pass" less than 2.0, or has withdrawn after 10th day.

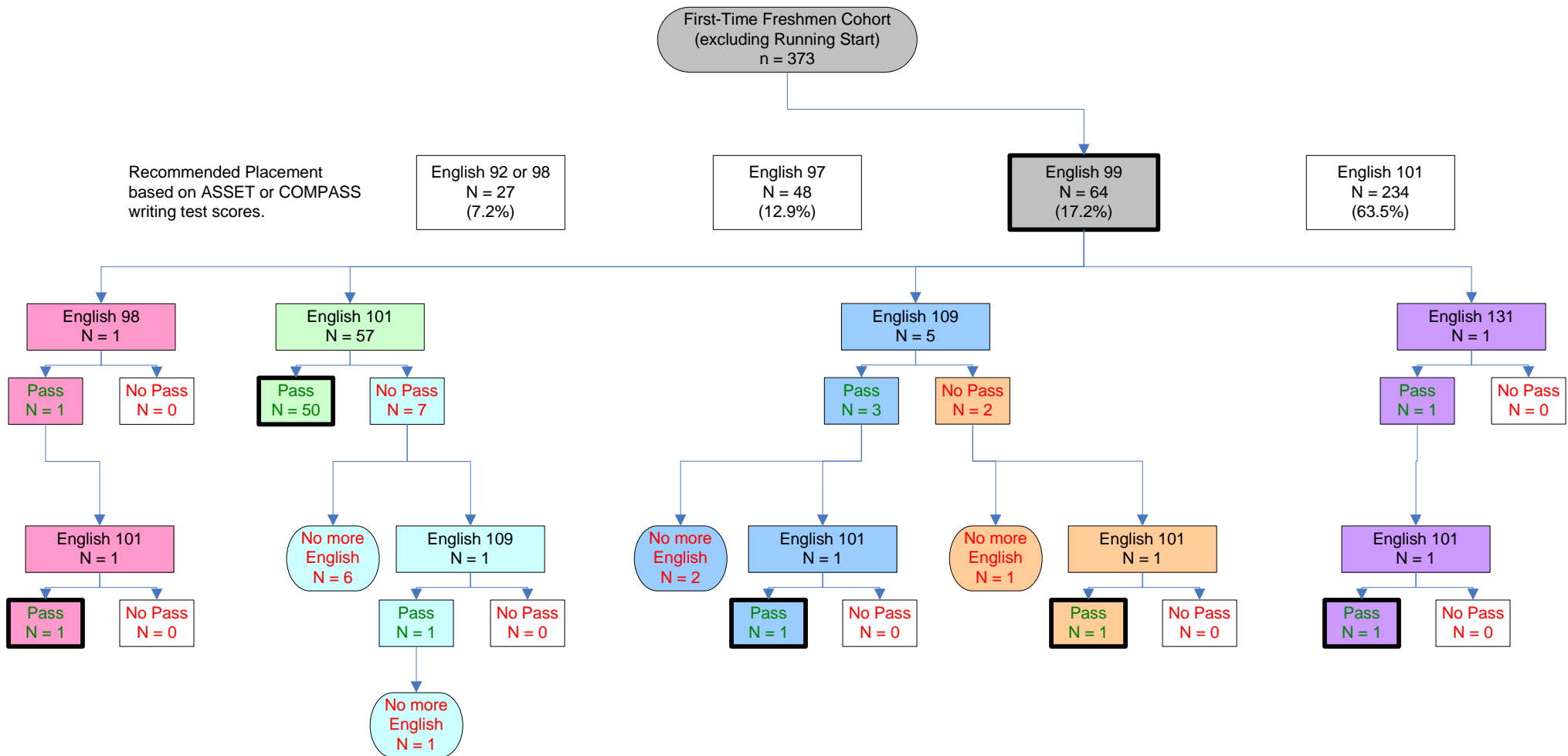




Observations:

- 1) 65% (31 out of 48) of students placed into Eng 97 actually take Eng 97, and 65% (20 out of 31) of those pass the class.
- 2) About ½ (17 out of 31) of the students in this cohort who take Eng 97 end up taking no more Eng, whether they pass the class or not.
- 3) About 1/3 (14 out of 48) of the students in this cohort opt to take Eng 101, and 93% (13 out of 14) passed.
- 3) Of those students who take Eng 97 and pass it, only 50% (10 out of 20) go on to pass Eng 100.
- 4) Only 52% (25 out of 48) of students placed into Eng 97 go on to pass Eng 101, regardless of the path they take.

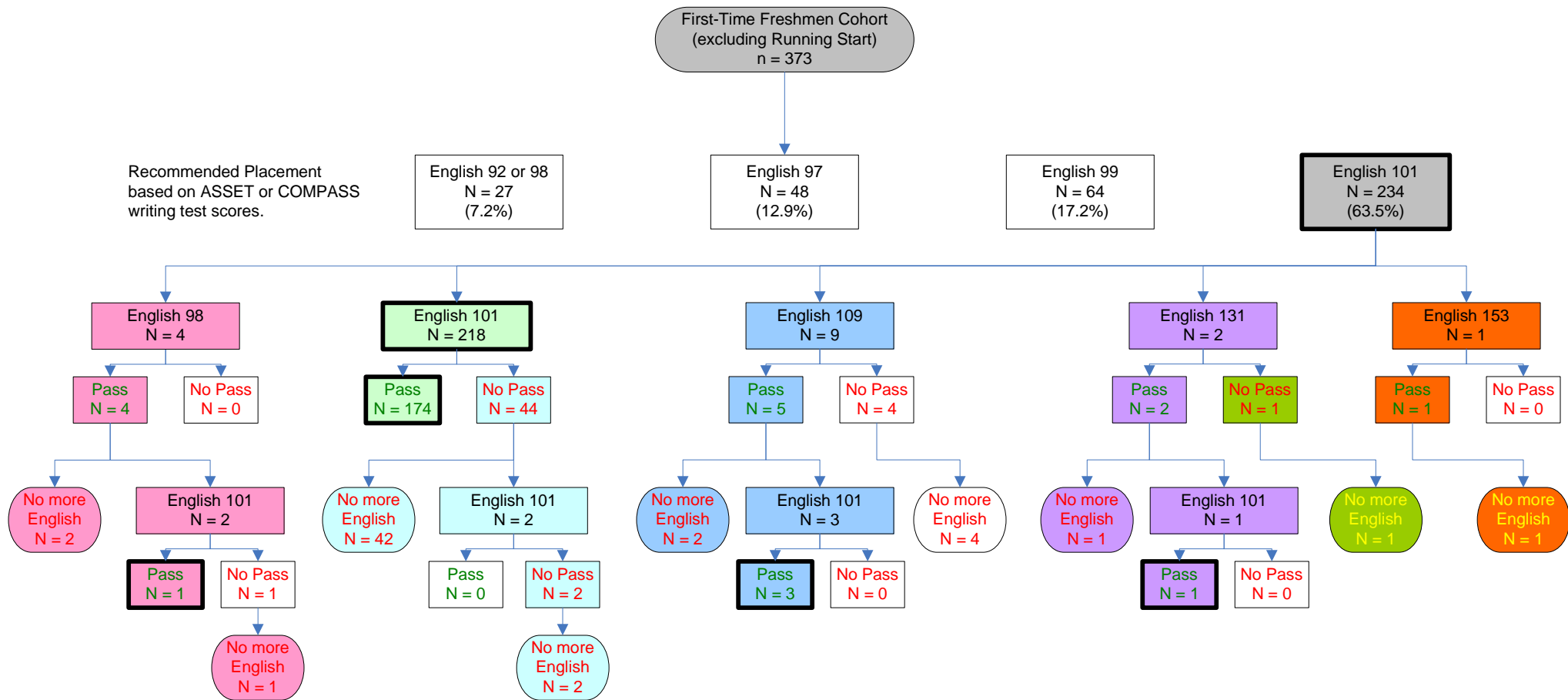
Note: "Pass" = 2.0 or higher; "No Pass" less than 2.0, or has withdrawn after 10th day.



Observations:

- 1) None of students placed into Eng 99 actually take Eng 99.
- 1) 98% (63 out of 64) of students place into Eng 99 opt to take Eng 101 or higher, and 83% (53 out of 64) of these students go on to pass Eng 101.

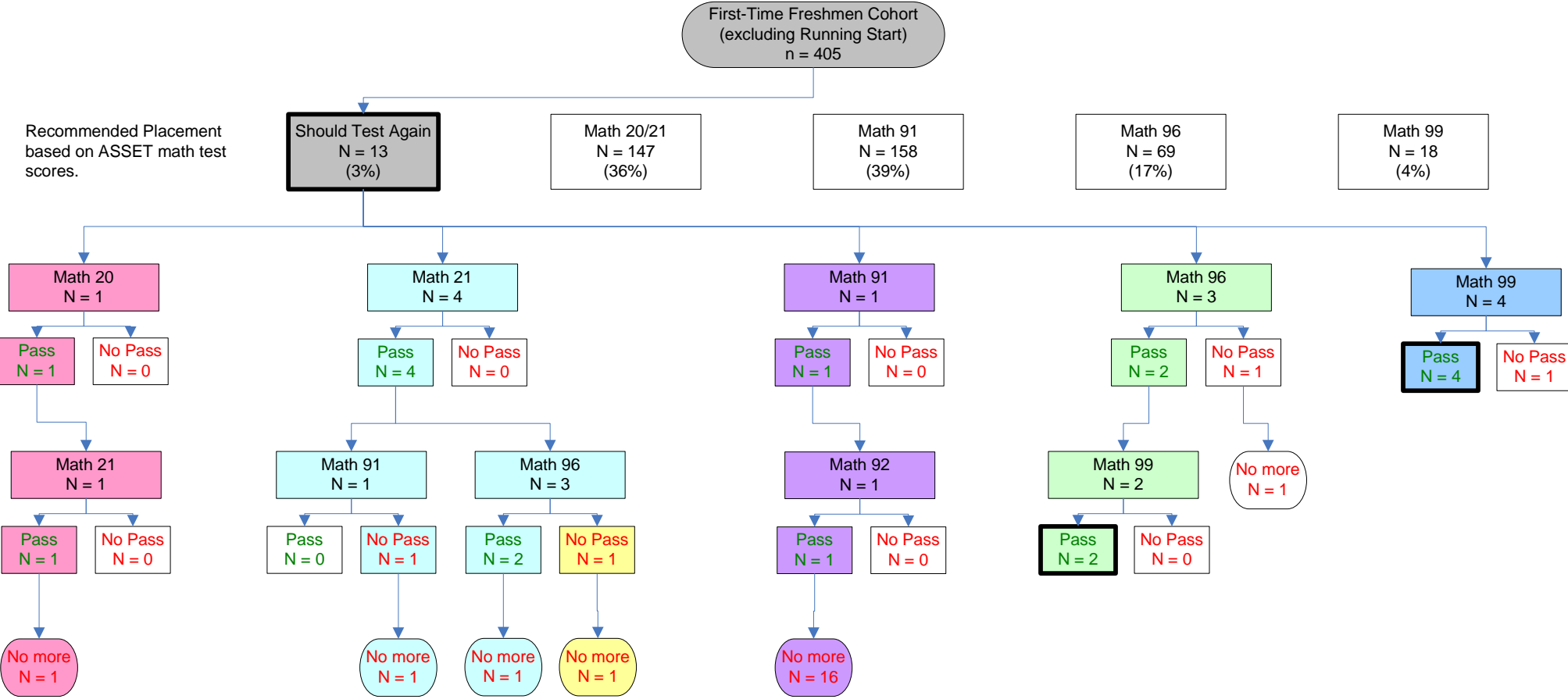
Note: "Pass" = 2.0 or higher, or "P" in Pass/Fail classes; "No Pass" less than 2.0, or has withdrawn after 10th day.



Observations:

- 1) 93% (218 out of 234) of students placed into Eng 101 actually take Eng 101, and 80% (174 out of 218) of those pass the class.
- 2) Of those students who are placed into Eng 101 and opt to take courses other than Eng 101, only 31% (5 out of 16) go on to pass Eng 101.
- 3) 76% (179 out of 234) of students placed into Eng 101 go on to pass Eng 101, regardless of the path they take.

Note: "Pass" = 2.0 or higher, or "P" in Pass/Fail classes; "No Pass" less than 2.0, or has withdrawn after 10th day.



Observations:

1) 100% (13 out of 13) of the students who should have tested again for math placement, passed the first math class they took anyway.

2) 38% (5 out of 13) of students who should have tested again for math placement but decided to take classes, went on to pass Math 99.

Note: "Pass" = 2.0 or higher; "No Pass" less than 2.0, or has withdrawn after 10th day.

Spokane Community College
Pathway Analysis

First-Time Liberal Arts Students
Who started during 2004-05

Placement into
Math 20 or 21

Recommended Placement
based on ASSET math test
scores.

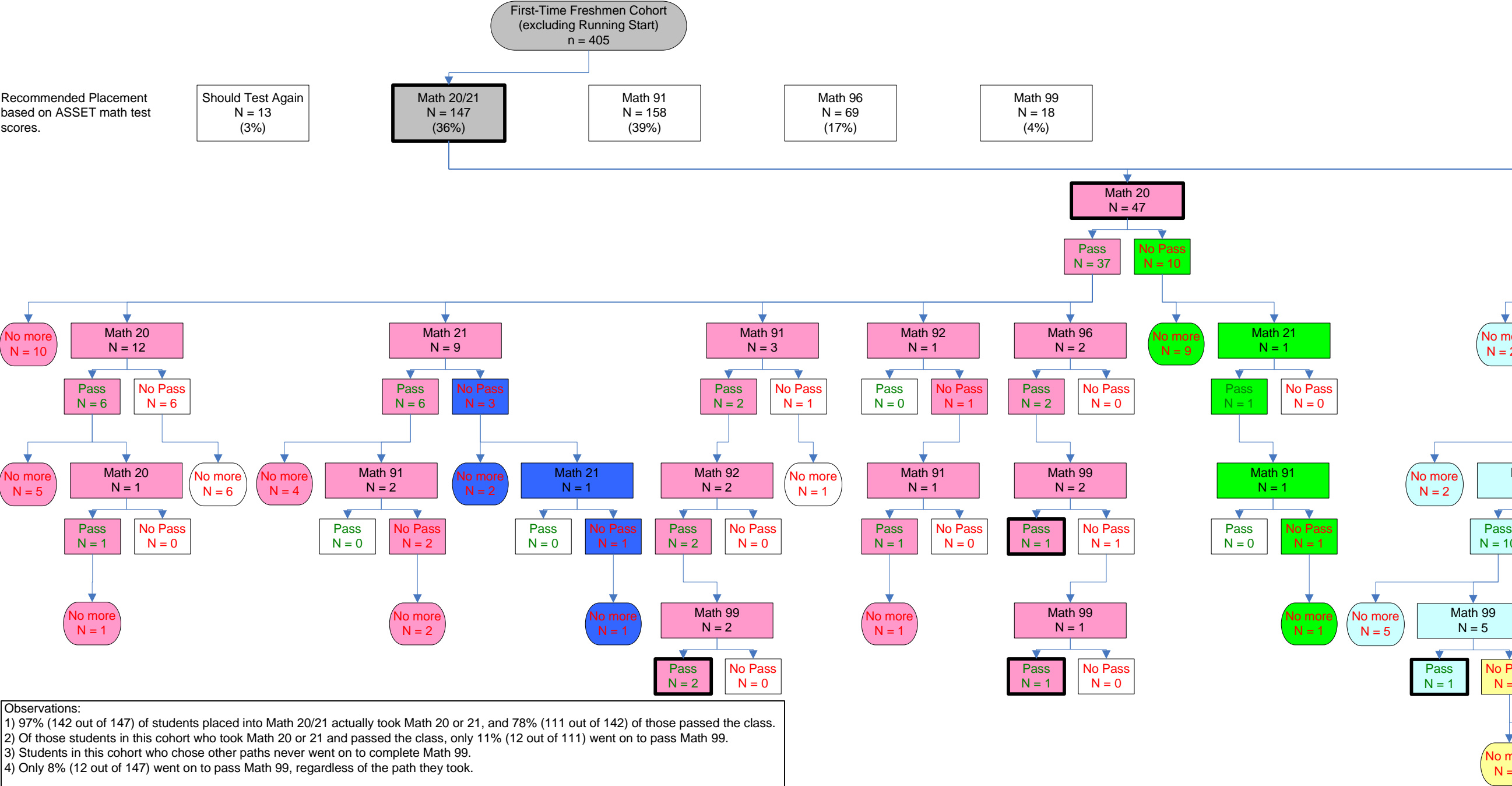
Should Test Again
N = 13
(3%)

Math 20/21
N = 147
(36%)

Math 91
N = 158
(39%)

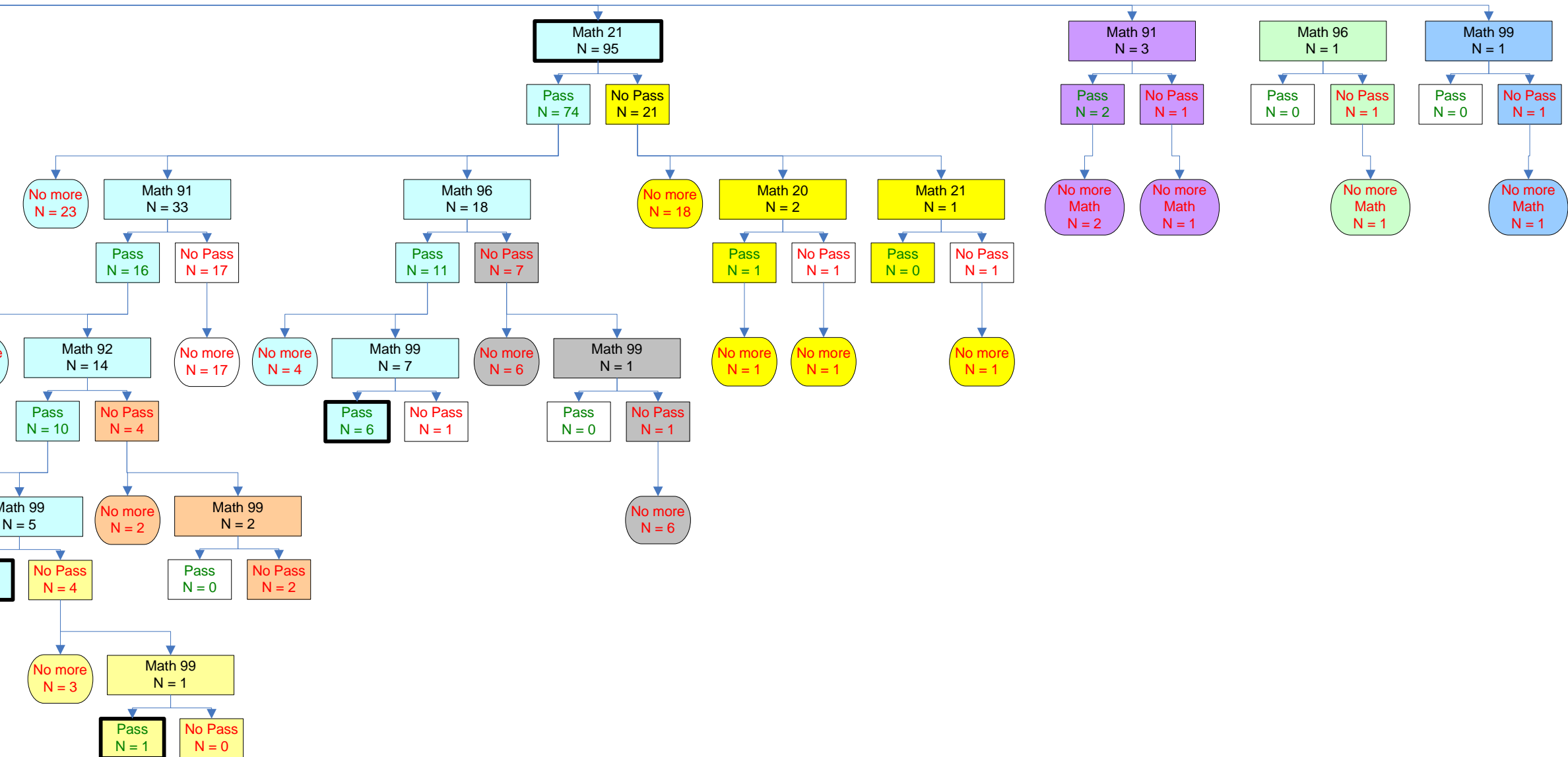
Math 96
N = 69
(17%)

Math 99
N = 18
(4%)



Observations:
1) 97% (142 out of 147) of students placed into Math 20/21 actually took Math 20 or 21, and 78% (111 out of 142) of those passed the class.
2) Of those students in this cohort who took Math 20 or 21 and passed the class, only 11% (12 out of 111) went on to pass Math 99.
3) Students in this cohort who chose other paths never went on to complete Math 99.
4) Only 8% (12 out of 147) went on to pass Math 99, regardless of the path they took.

Note: "Pass" = 2.0 or higher; "No Pass" less than 2.0, or has withdrawn after 10th day.



First-Time Freshmen Cohort
(excluding Running Start)
n = 405

Recommended Placement
based on ASSET math test
scores.

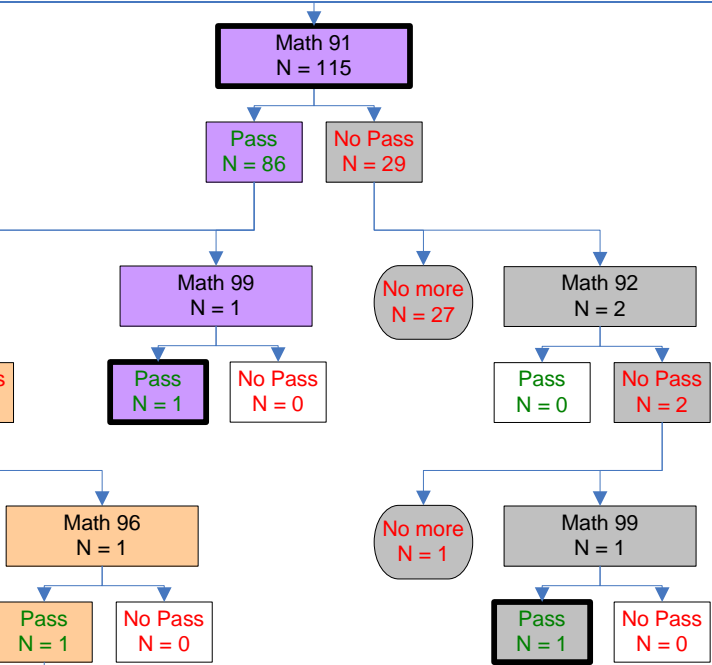
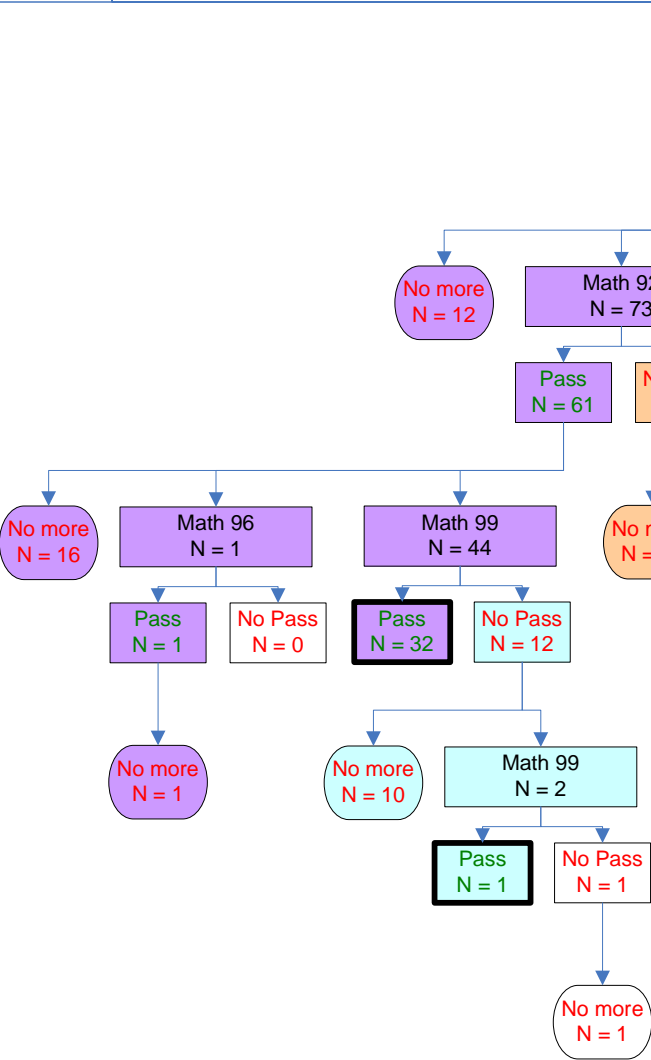
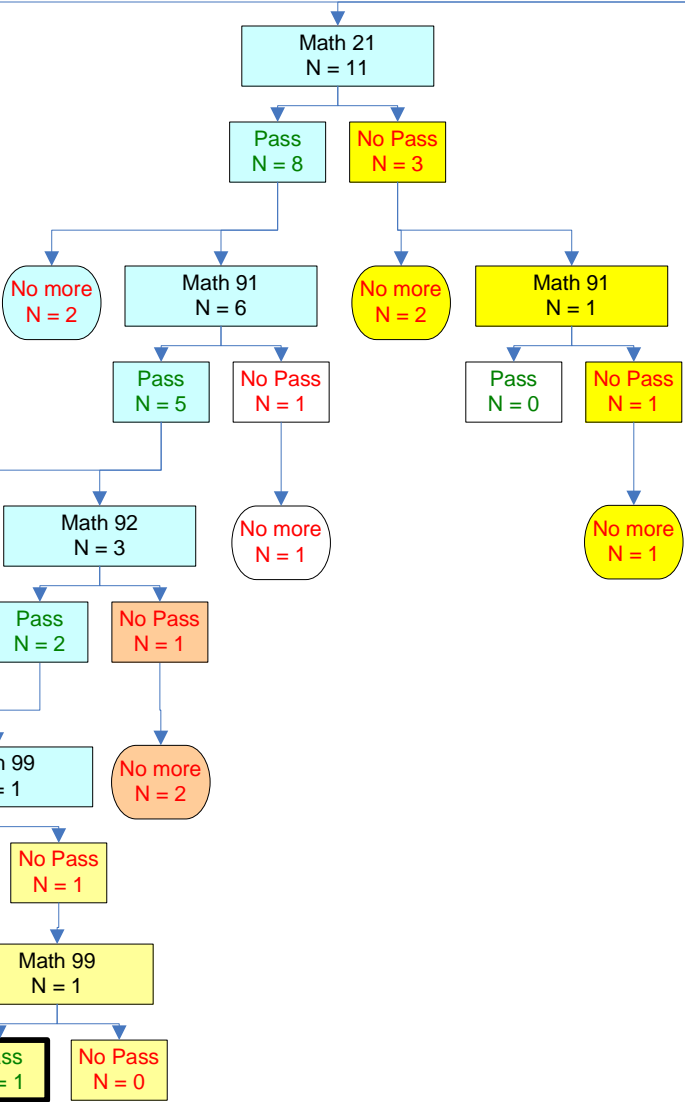
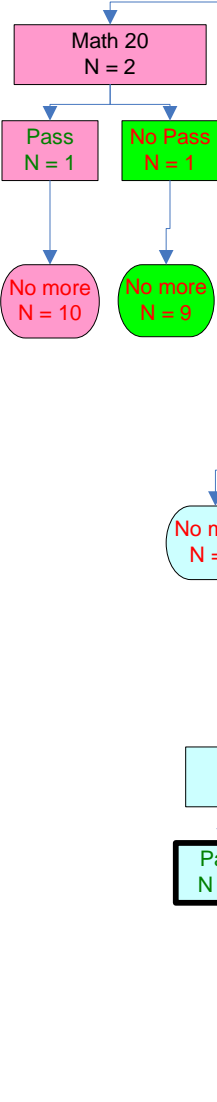
Should Test Again
N = 13
(3%)

Math 20/21
N = 147
(36%)

Math 91
N = 158
(39%)

Math 96
N = 69
(17%)

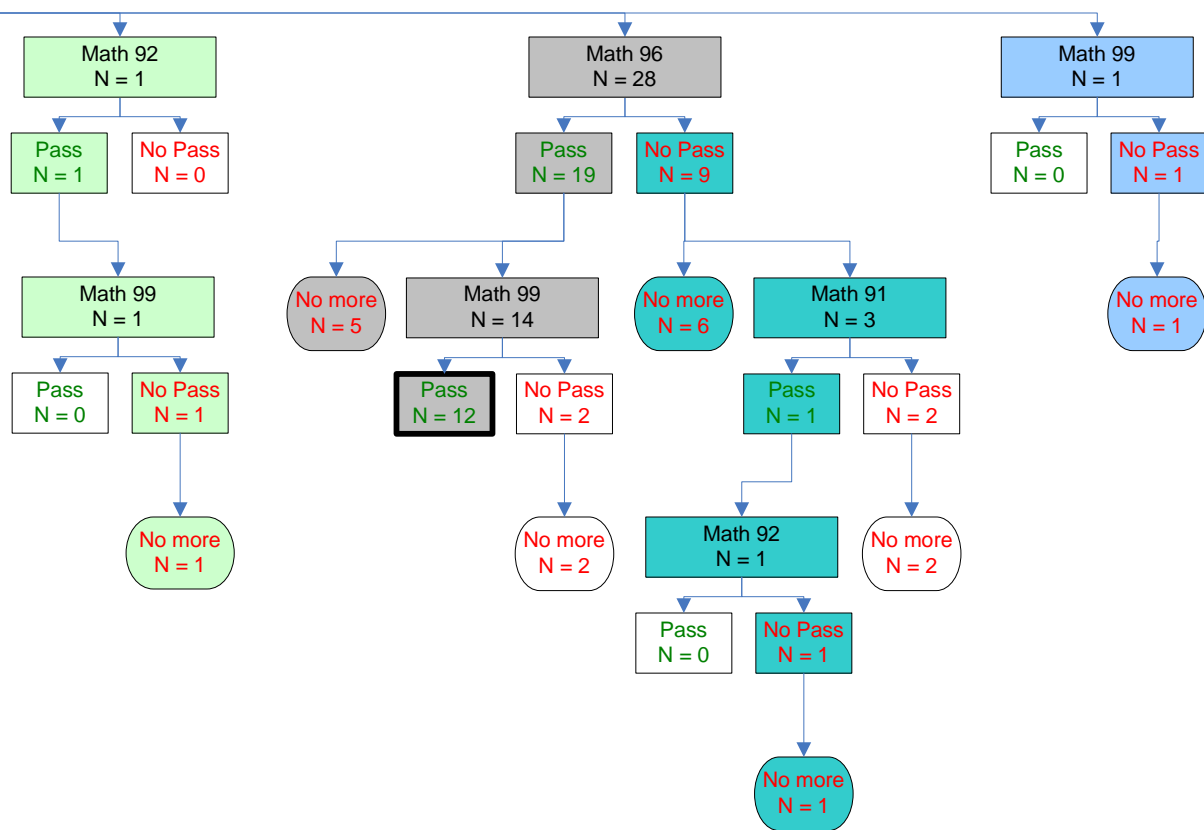
Math 99
N = 18
(4%)



Observations:

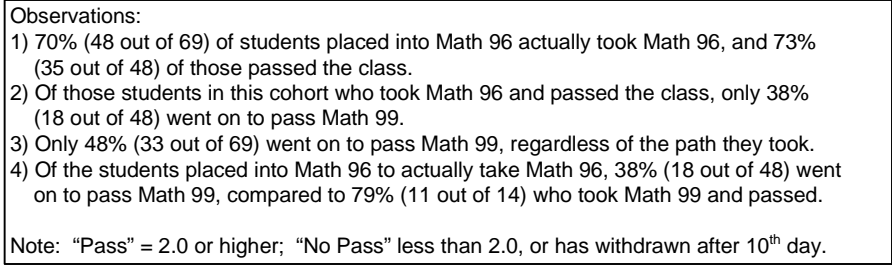
- 1) 73% (115 out of 158) of students placed into Math 91 actually took Math 91,
- 2) Of those students in this cohort who took Math 91 and passed the class, only 31% (49 out of 159) went on to pass Math 99, regardless of the path taken.
- 3) Only 31% (49 out of 159) went on to pass Math 99, regardless of the path taken.
- 4) Of the students placed into Math 91 to actually take Math 91, 30% (35 out of 115) who took Math 96 and went on to pass Math 99.

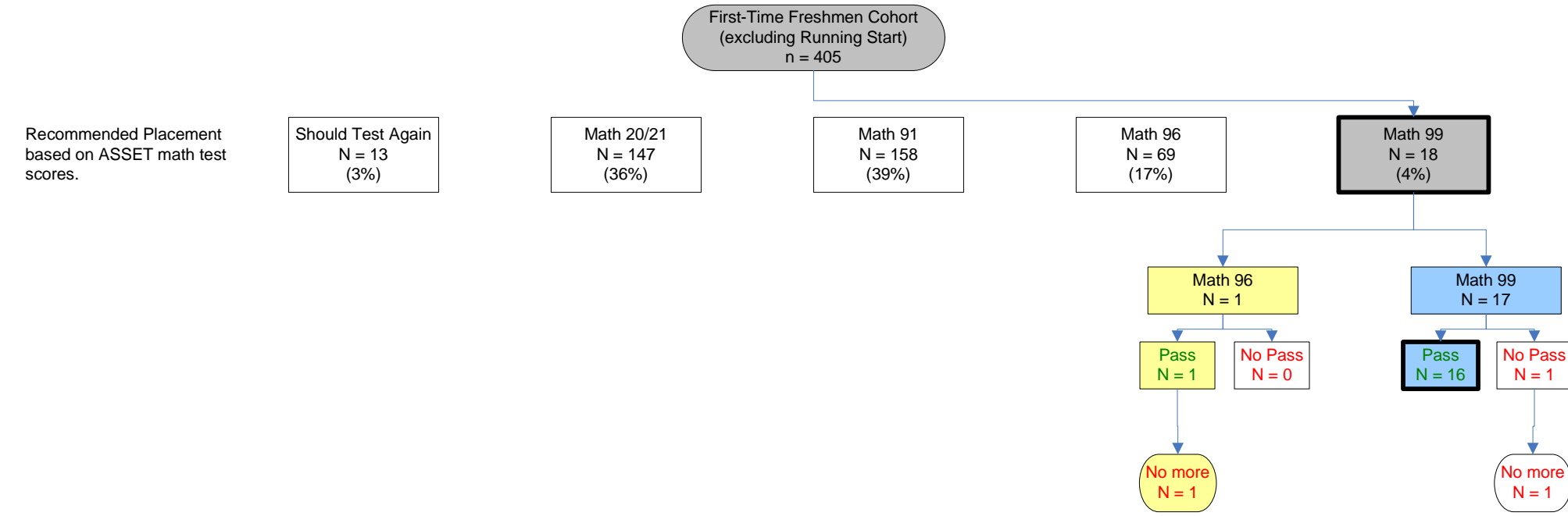
Note: "Pass" = 2.0 or higher; "No Pass" less than 2.0, or has withdrawn after the semester.



Math 91, and 75% (86 out of 115) of those passed the class.
class, only 40% (34 out of 86) went on to pass Math 99.
the path they take.
(35 out of 115) went on to pass Math 99, compared to 43% (12 out of 28)
awn after 10th day.

Placement into Math 96



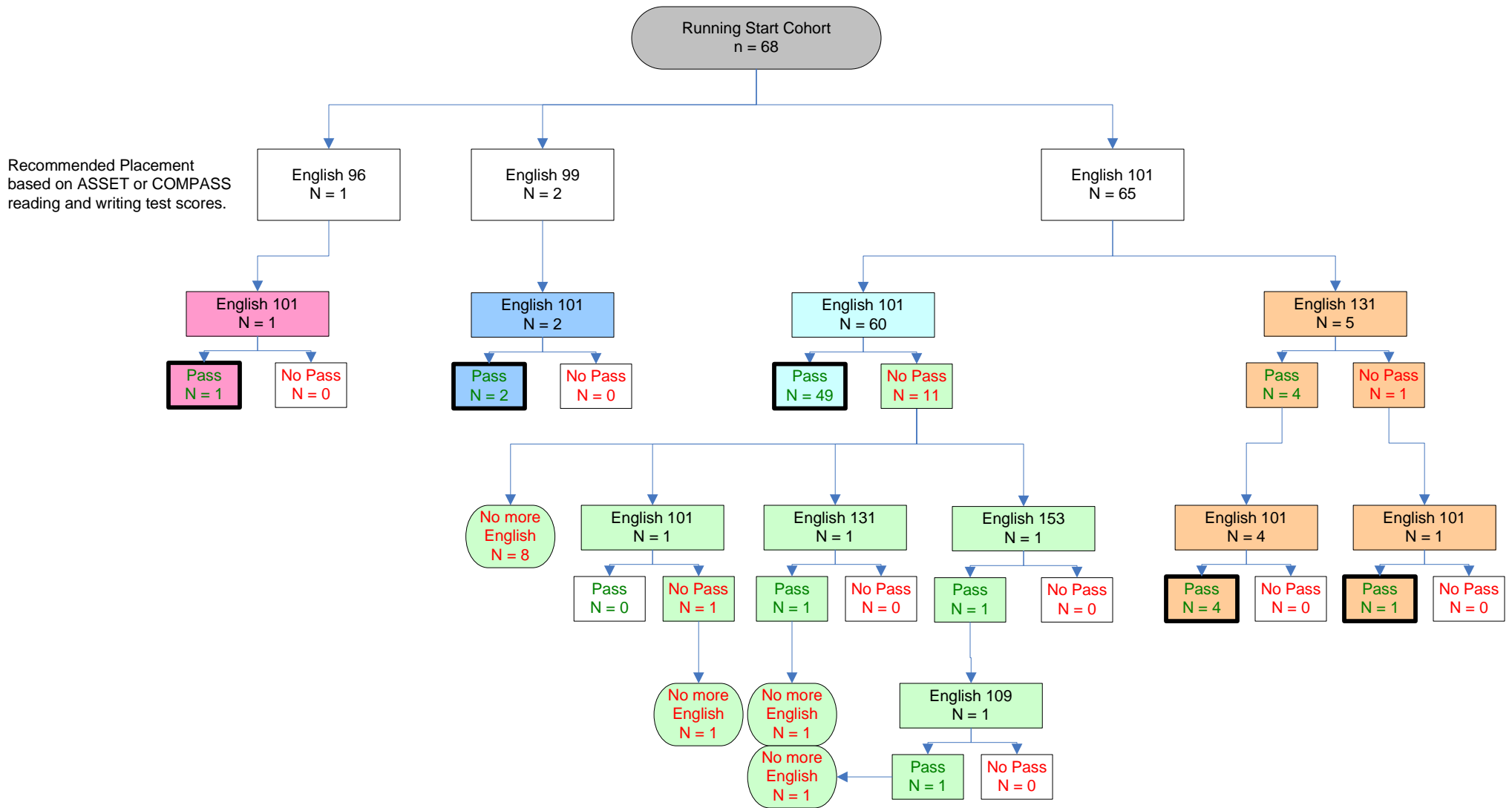


Observations:

1) 94% (17 out of 18) of students placed into Math 99 actually take Math 96, and 94% (16 out of 17) of those pass the class.

2) 89% (16 out of 18) went on to pass Math 99, regardless of the path they took.

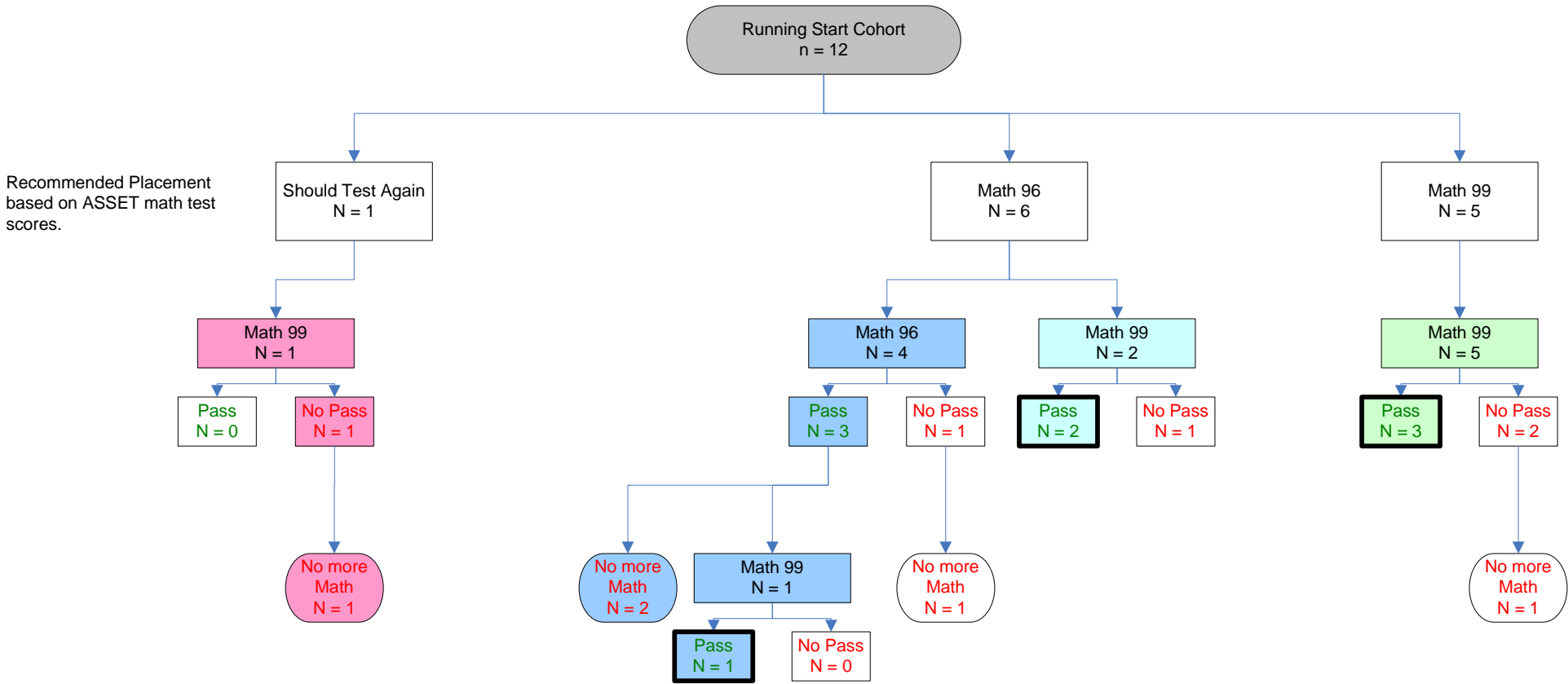
Note: "Pass" = 2.0 or higher; "No Pass" less than 2.0, or has withdrawn after 10th day.



Observations:

- 1) Regardless of placement, 93% (63 out of 68) of running start students opt to take Eng 101, and 83% (52 out of 63) of those students pass the class.
- 2) Overall, 84% (57 out of 68) of running start students go on to pass Eng 101, regardless of the path they take.

Note: "Pass" = 2.0 or higher, or "P" in Pass/Fail classes; "No Pass" less than 2.0, or has withdrawn after 10th day.



Observations:
1) Overall, 50% (6 out of 12) of running start students go on to pass Math 99, regardless of the path they take.

Note: "Pass" = 2.0 or higher, or "P" in Pass/Fail classes; "No Pass" less than 2.0, or has withdrawn after 10th day.