# Comments for MEDB 5502, Week 07

# Topics to be covered

- Most of the lecture will come directly from
  - An Introduction to Diagnostic Tests, by Stephen D. Simon (me!).
- There is a small section on diagnostic tests with multiple values and the receiver operating characteristic curve which is covered here.

# What about a diagnostic test with multiple values?

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |

Speaker notes

# Cut-point = 100

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |

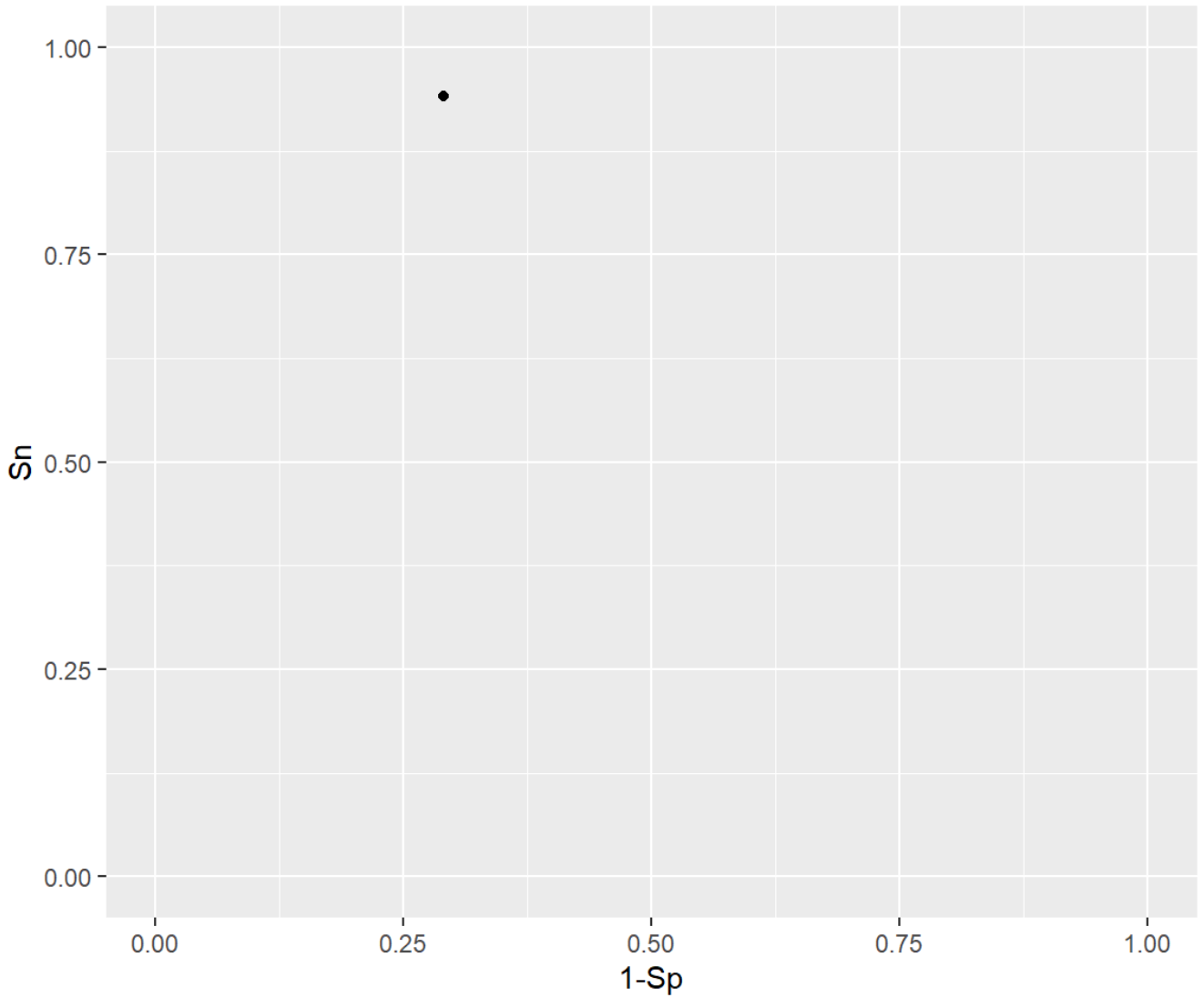
| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| <100 ug/l | 761 | 540 |

| | | |
|---|---|---|
| Sn | 761/(761+48) | 94.1% |
| Sp | 1320/(1320+540) | 71.0% |

Speaker notes

Here is the crosstabulation with the first row as a negative result, the second through sixth as a positive result.

# ROC curve, 1 of 7



# Cut-point = 45

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| <15 ug/l | 474 | 20 |

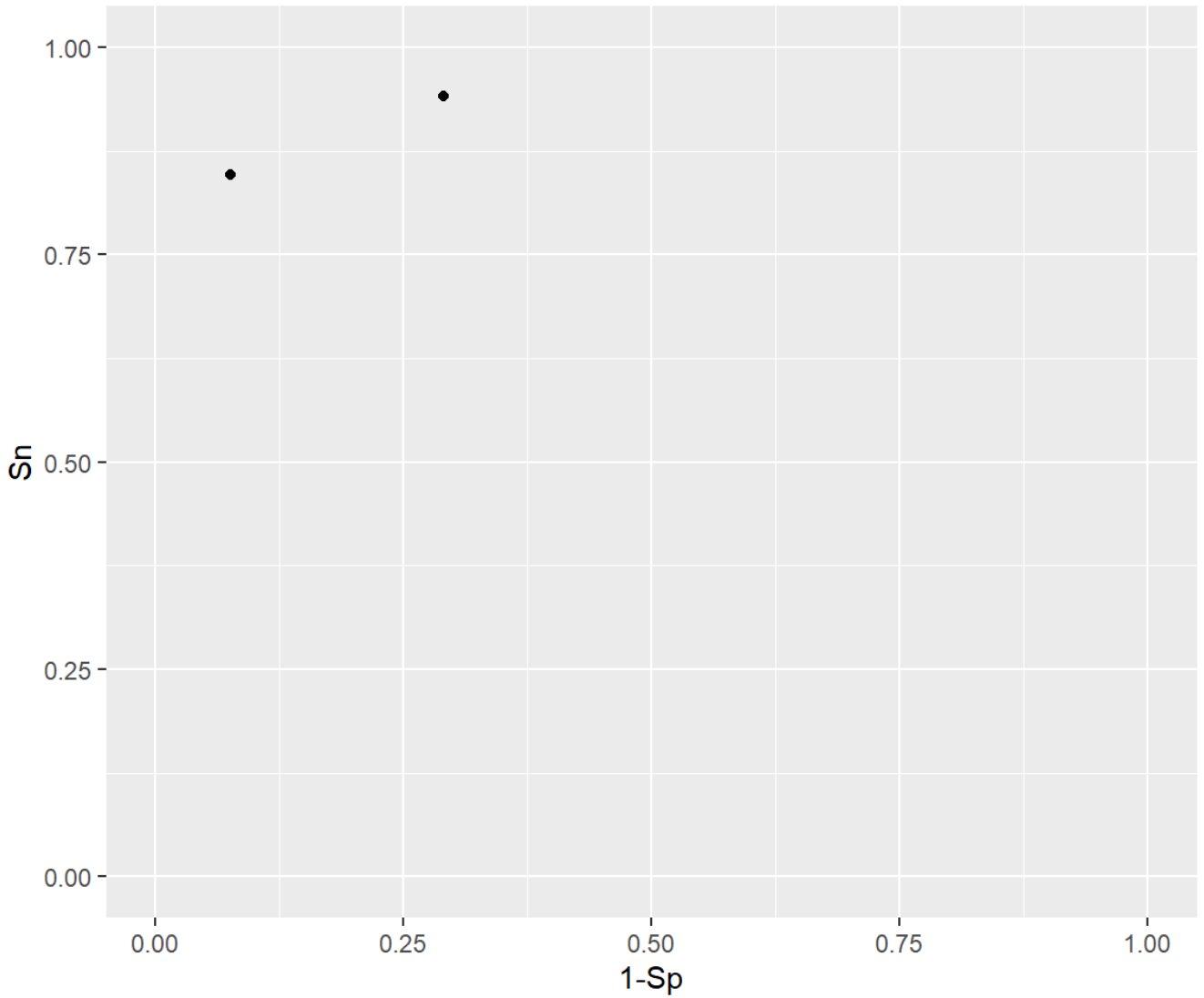
| | Yes | No |
|---|---|---|
| >=45 ug/l | 124 | 1718 |
| <45 ug/l | 685 | 142 |

| | | |
|---|---|---|
| Sn | 685/(685+124) | 84.7% |
| Sp | 1718/(1718+142) | 92.4% |

Speaker notes

Here is a crosstabulation with the first and second rows as a negative result, third through sixth as a positive result.

# ROC curve, 2 of 7



# Cut-point = 35

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |

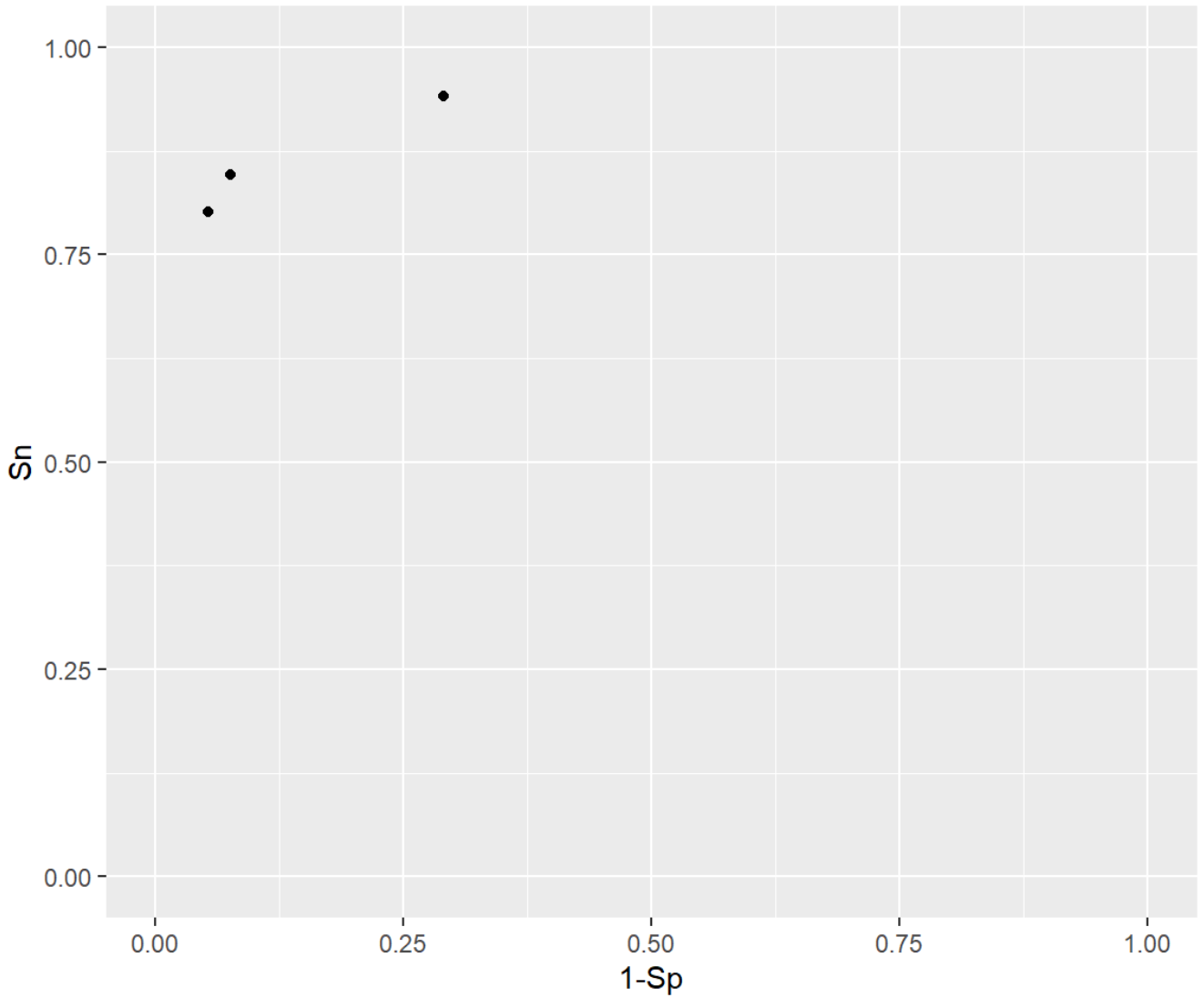
| | Yes | No |
|---|---|---|
| >=35 ug/l | 160 | 1761 |
| <35 ug/l | 649 | 99 |

| | | |
|---|---|---|
| Sn | 649/(649+160) | 80.2% |
| Sp | 1761/(1761+99) | 94.7% |

Speaker notes

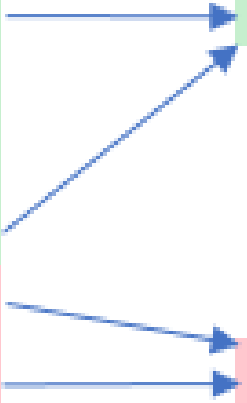
Here is a crosstabulation with the first through the third rows as a negative result, and the fourth through sixth rows as a positive result.

# ROC curve, 3 of 7



# Cut-point = 25

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |



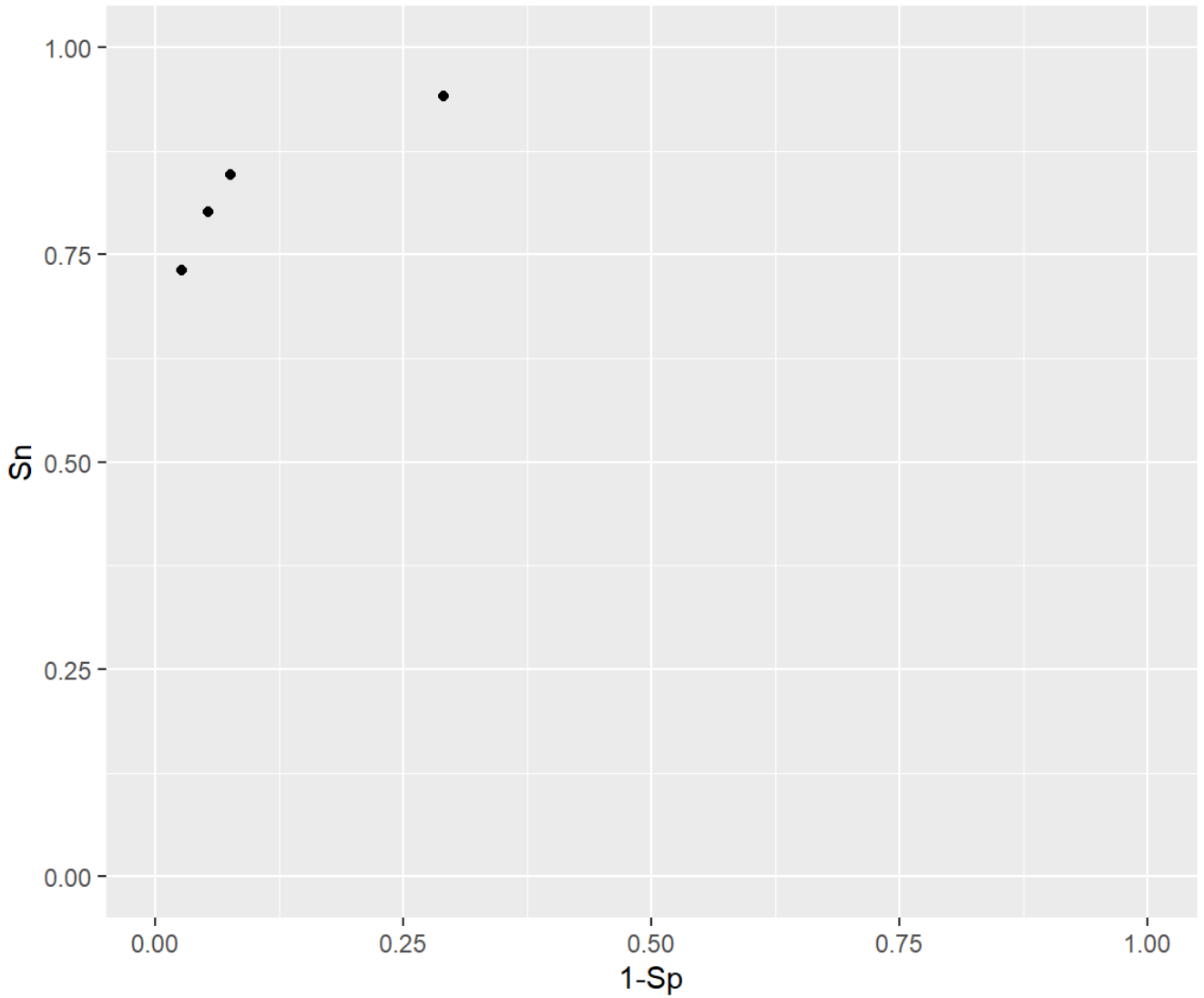
| | Yes | No |
|---|---|---|
| >=25 ug/l | 218 | 1811 |
| <25 ug/l | 591 | 49 |

| | | |
|---|---|---|
| Sn | 591/(591+218) | 73.1% |
| Sp | 1811/(1811+49) | 97.4% |

Speaker notes

Here is a crosstabulation with the first through the fourth rows as a negative result, and the fifth and sixth rows as a positive result.

# ROC curve, 4 of 7



# Cut-point = 15

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |

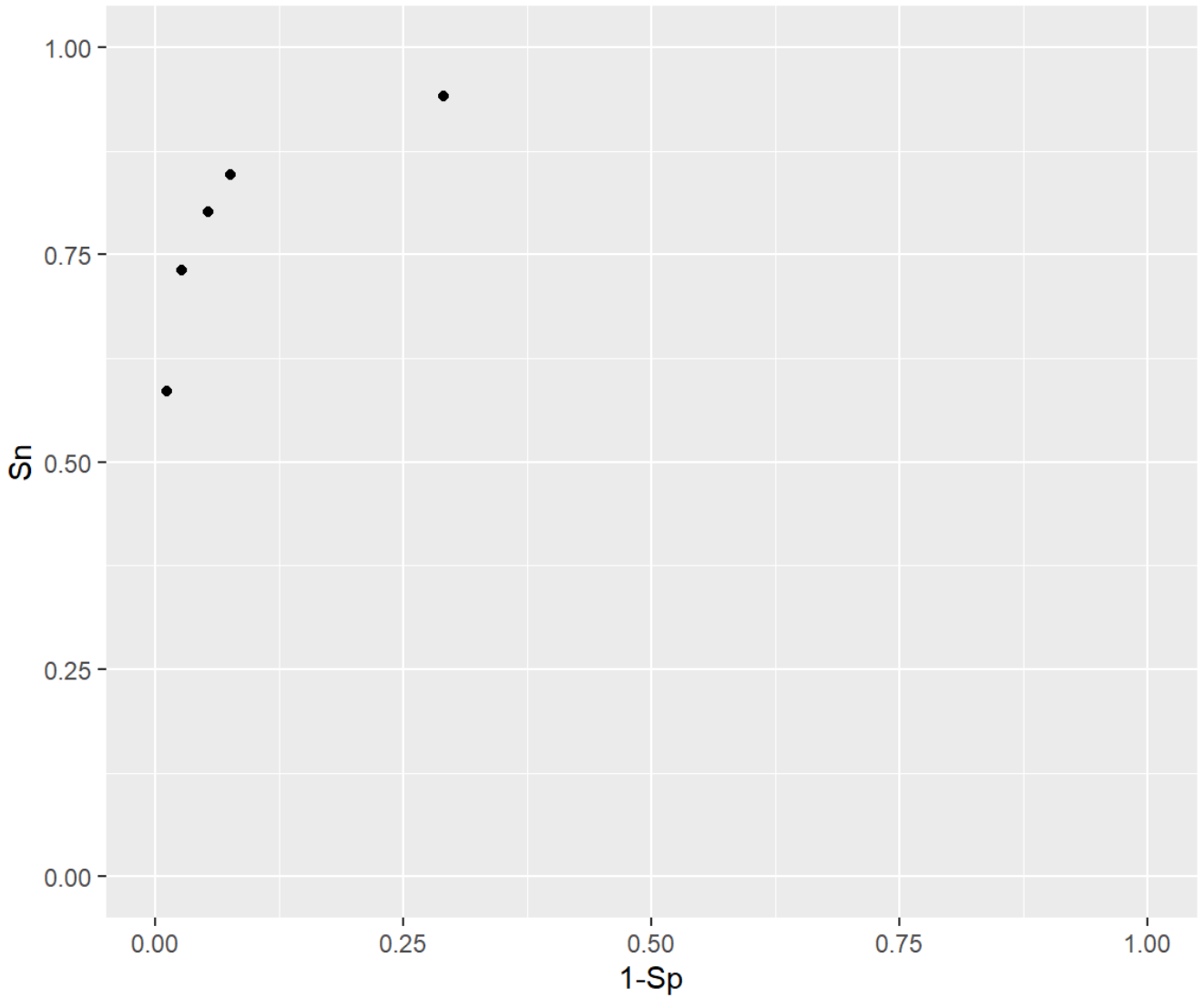
| | Yes | No |
|---|---|---|
| >=15 ug/l | 335 | 1840 |
| <15 ug/l | 474 | 20 |

| | | |
|---|---|---|
| Sn | 474/(474+335) | 58.6% |
| Sp | 1840/(1840+20) | 98.9% |

Speaker notes

Here is a crosstabulation with the first through the fifth rows as a negative result, and the sixth row as a positive result.

# ROC curve, 5 of 7



# Cut-point = 0

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |

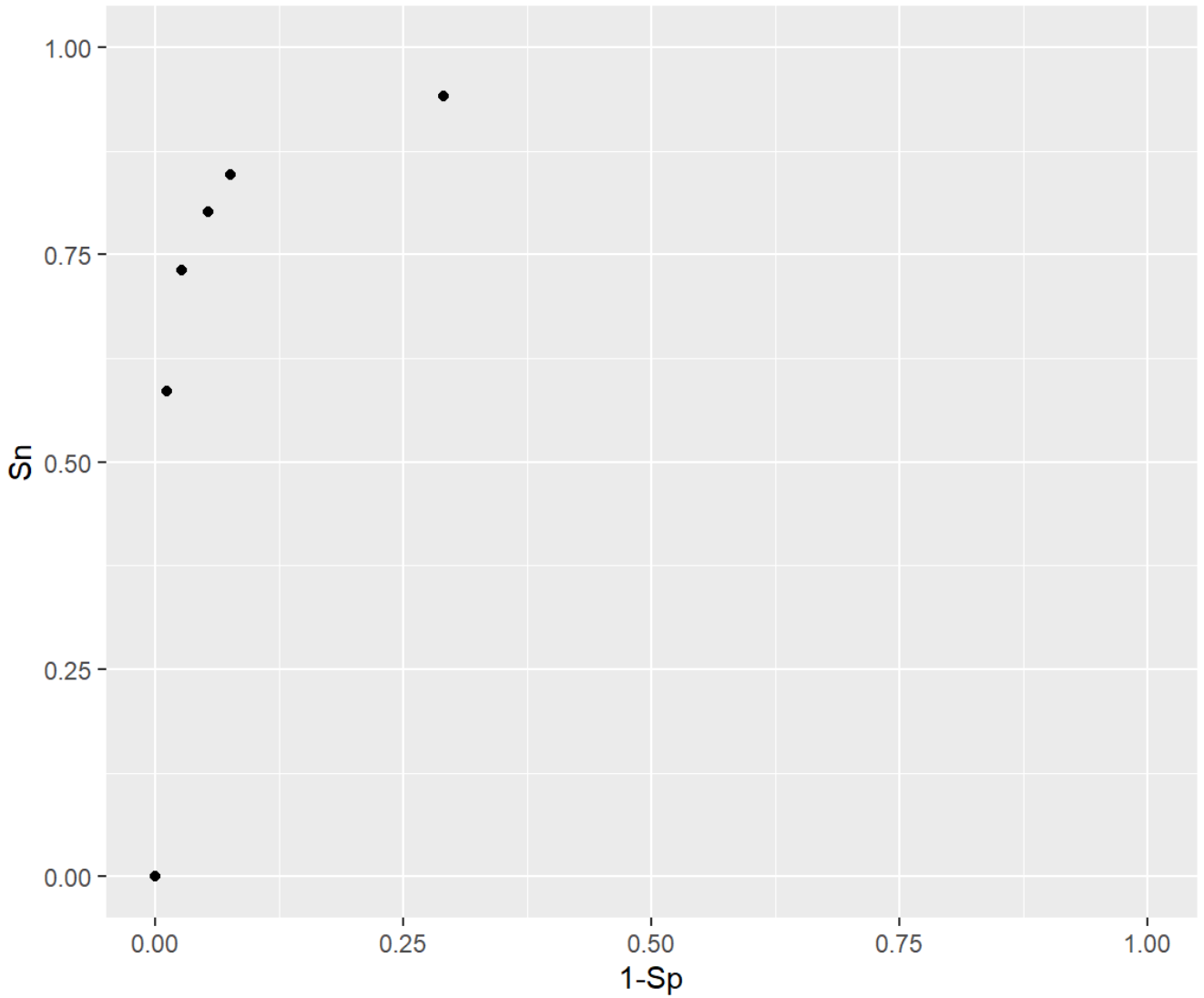
| | Yes | No |
|---|---|---|
| >=0 ug/l | 809 | 1860 |
| <0 ug/l | 0 | 0 |

| | | |
|---|---|---|
| Sn | 0/(0+809) | 0% |
| Sp | 1860/(1860+0) | 100% |

Speaker notes

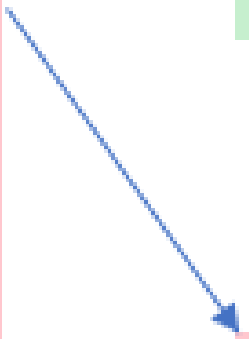
Here is a crosstabulation with all rows as a negative result.

# ROC curve, 6 of 7



# Cut-point = Infinity

| | Yes | No |
|---|---|---|
| >=100 ug/l | 48 | 1320 |
| 45-100 ug/l | 76 | 398 |
| 35-45 ug/l | 36 | 43 |
| 25-35 ug/l | 58 | 50 |
| 15-25 ug/l | 117 | 29 |
| < 15 ug/l | 474 | 20 |



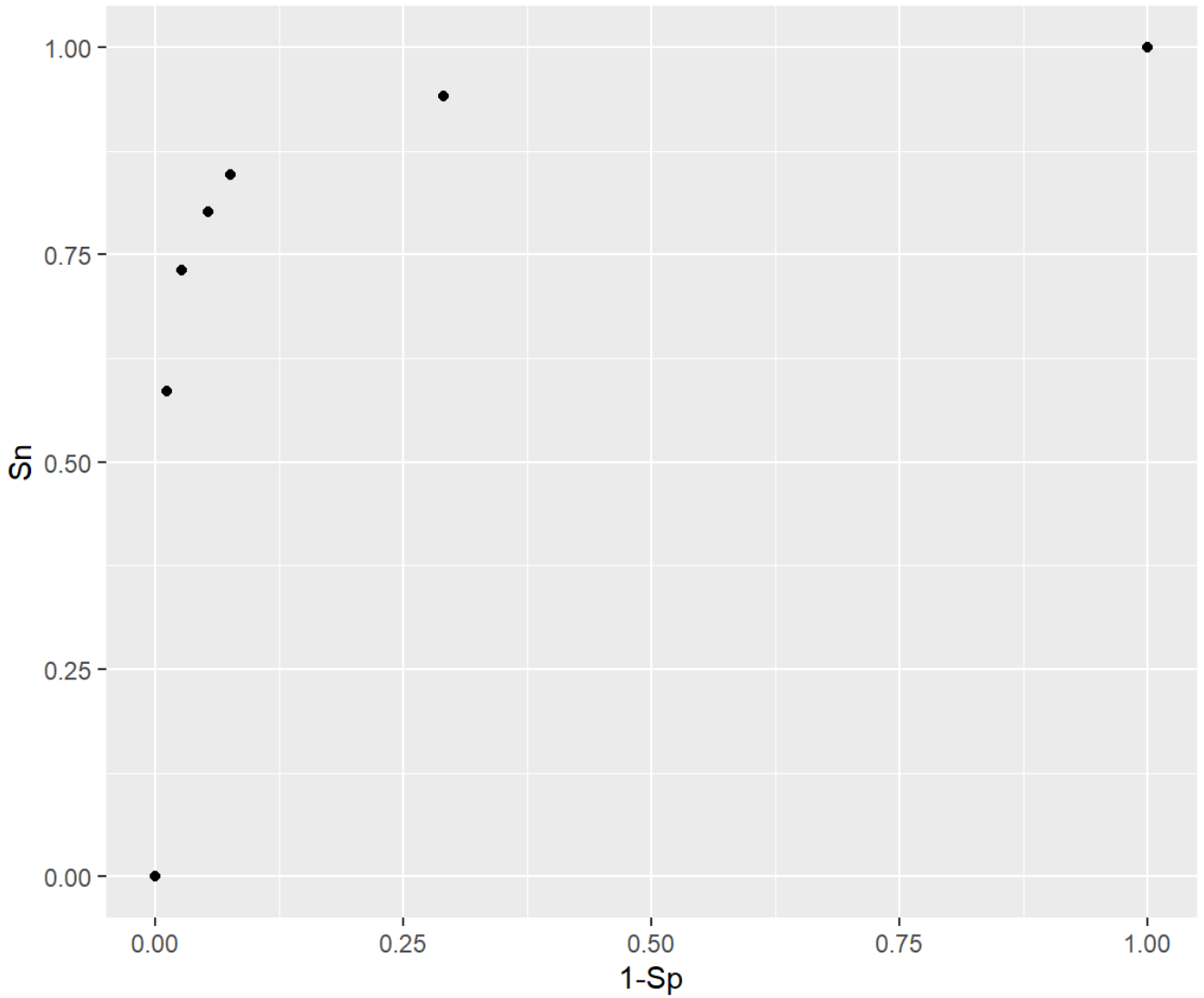
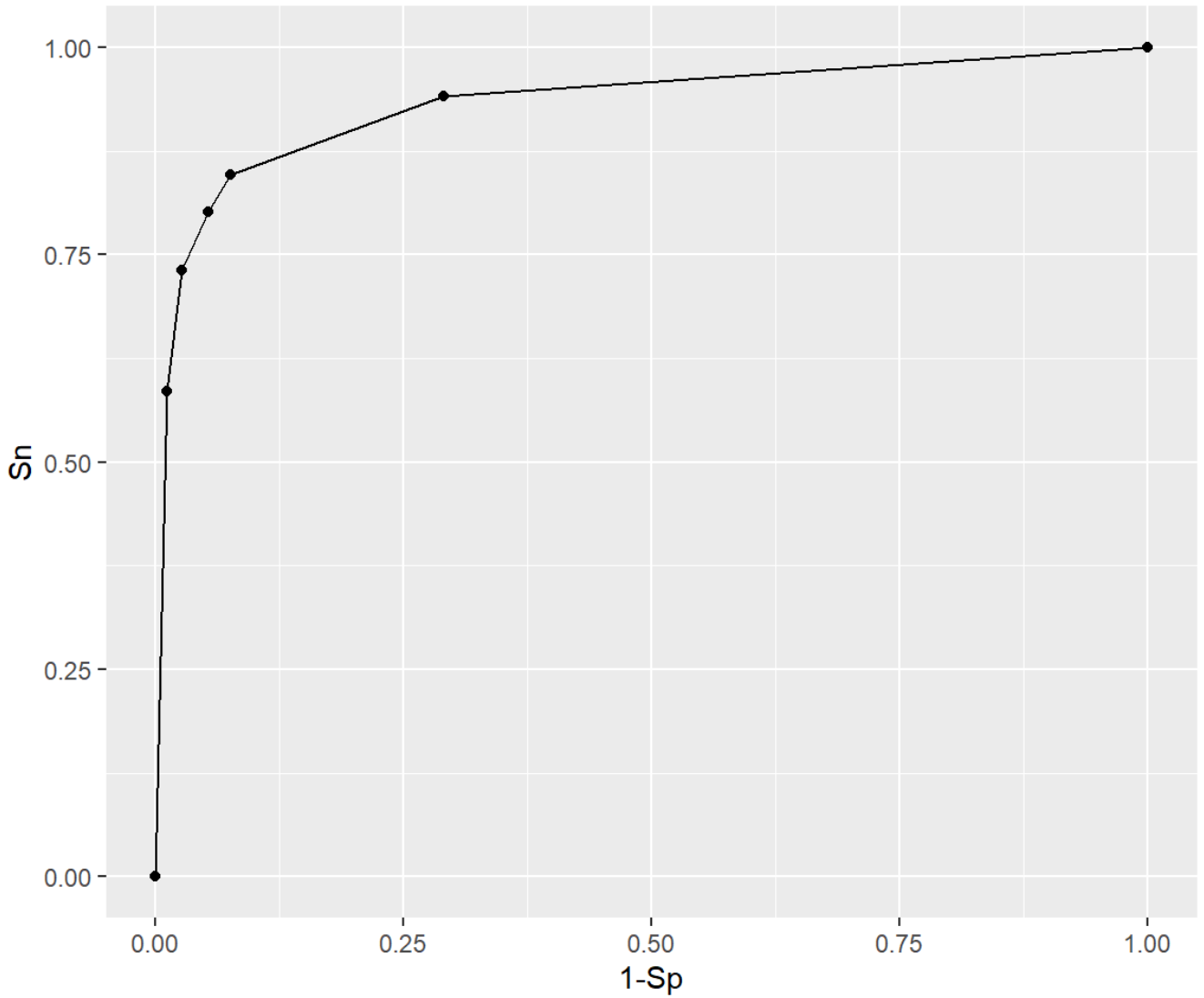
| | Yes | No |
|---|---|---|
| >=Infinty | 0 | 0 |
| <Infinity | 809 | 1860 |

| | | |
|---|---|---|
| Sn | 809/(809+0) | 100% |
| Sp | 0/(0+1860) | 0% |

Speaker notes

Here is a crosstabulation with all rows as a negative result.

# ROC curve, 7 of 7



# Final ROC curve