SNSF Report

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Introduction

Data Description

We have three data sets: Applications, External Reviewers and Internal Referees. They contain respectively information about the SNSF project funding applications, the evaluation of the applications by external peer reviewers and the evaluation of the proposals by external the internal referee and co-referee (when available). For a full description of the data & variables, please see the Appendix.

Cleaning the Data

We decide to work with only complete applications, i.e. project for which we have information from all the three data sets.

As we have only information from reviewers and referees since 2016, we are considering applications only from that year.

Specific to each data set, this are the detailed considerations:

Applications

We decide to consider only the MainDiscipline2 because for MainDiscipline we have 118 levels, while for the other only 21.

There is one application for which we do not know the gender of the applicant, and therefore we decided to omit that observation from the analysis.

We will also not consider the variables "CallTitle", "Professorship", "AcademicAge". The first one, because we consider it has nothing to add to the model. The two last, due to the fact that there are a considerable number of NA's on those variables (around 93% of the observations).

```
## 
##     Assistant professor with tenure track 
##                                        102 
## Assistant professor without tenure track 
##                                         54 
##                        Associate professor 
##                                        237 
##                             Full professor 
##                                        512 
##   Honorary professor or Titular professor 
##                                         77 
##                                       None 
##                                        430 
##                       Professor at UAS / UTE 
##                                         74 
##                         Visiting professor 
```

```
##                                      4
##                                   <NA>
##                                  20037

## [1] 0.9307846

## [1] 0.9361267
```

External Reviewers

Reviewers always have the option to choose not to consider or to give the grade "0" when reviewing an application. Some might be mistakes, in others cases there might be a conflict of interest, or they might be very ambivalent about the project. Therefore, we did not considered observations with this grades.

One of the questions evaluated in the applications is "Broader impact (forms part of the assessment of scientific relevance, originality and topicality)". For the time frame we are considering, in all the applications this grade was NA. Hence, we omit this variable from our model.

Internal Referees

There were 22 observations (1 for the time frame we are dealing with) for which only demographic information was available, no grades were given. We decide to omit those observations.

Also we decide to not consider the Referee role as a variable in our model, as the majority of the evaluations has only one referee.

```
##
Applicant Explicit inclusion   Recusal
2   20   8
Referee   Second referee   <NA>
15766   870   1276
```
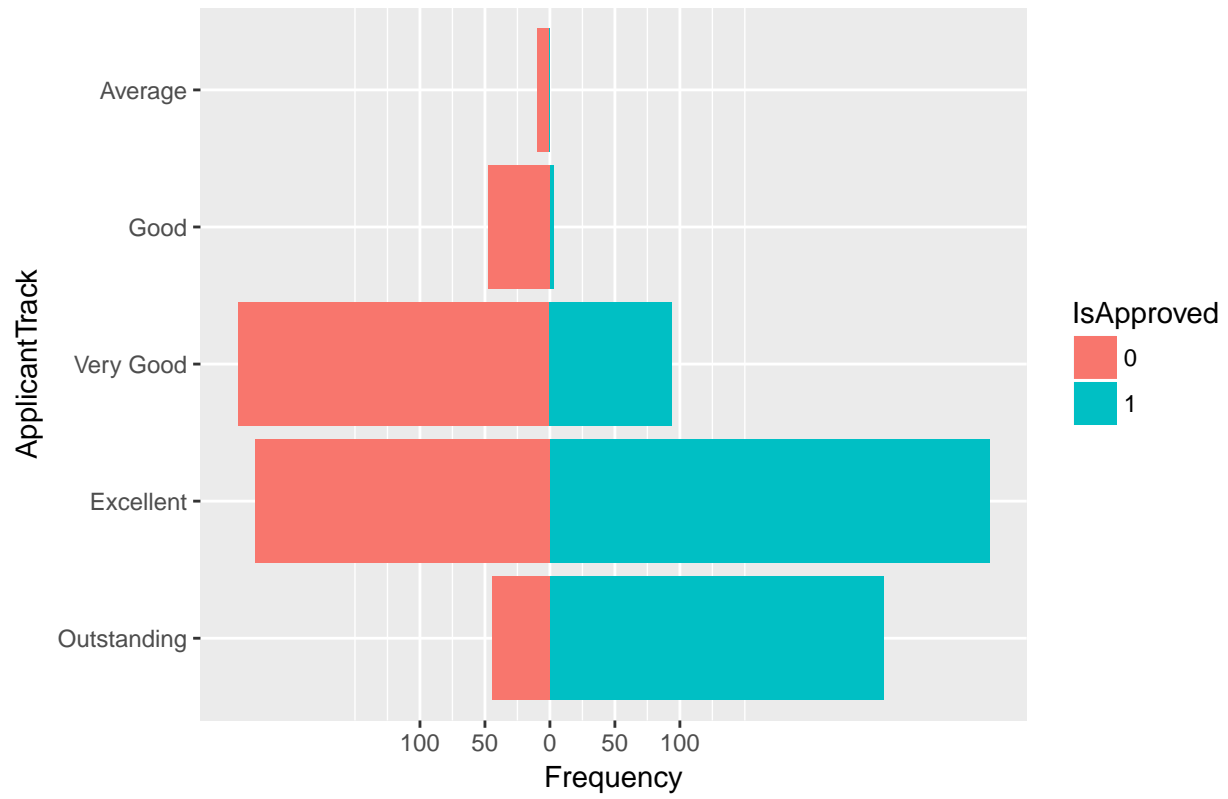
# Exploratory Analysis

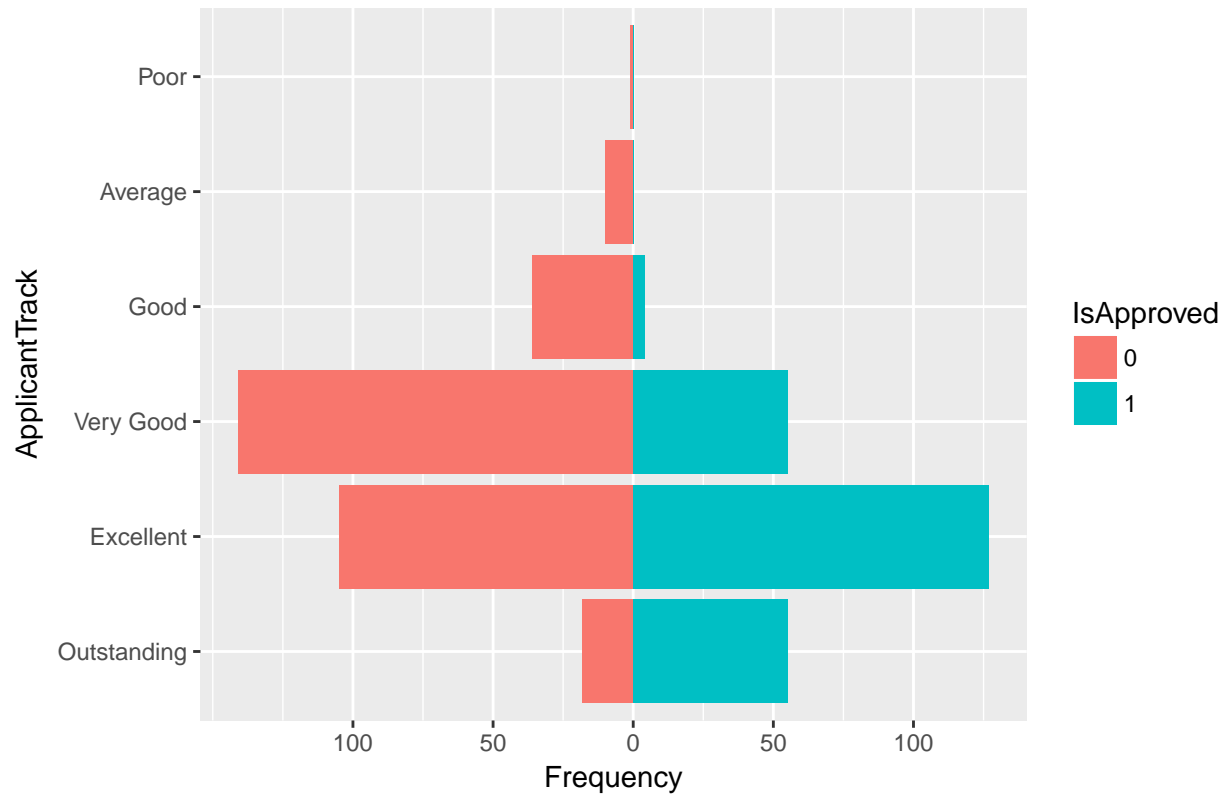**Relationship between OverallGrade and IsApproved in the External Review Step**
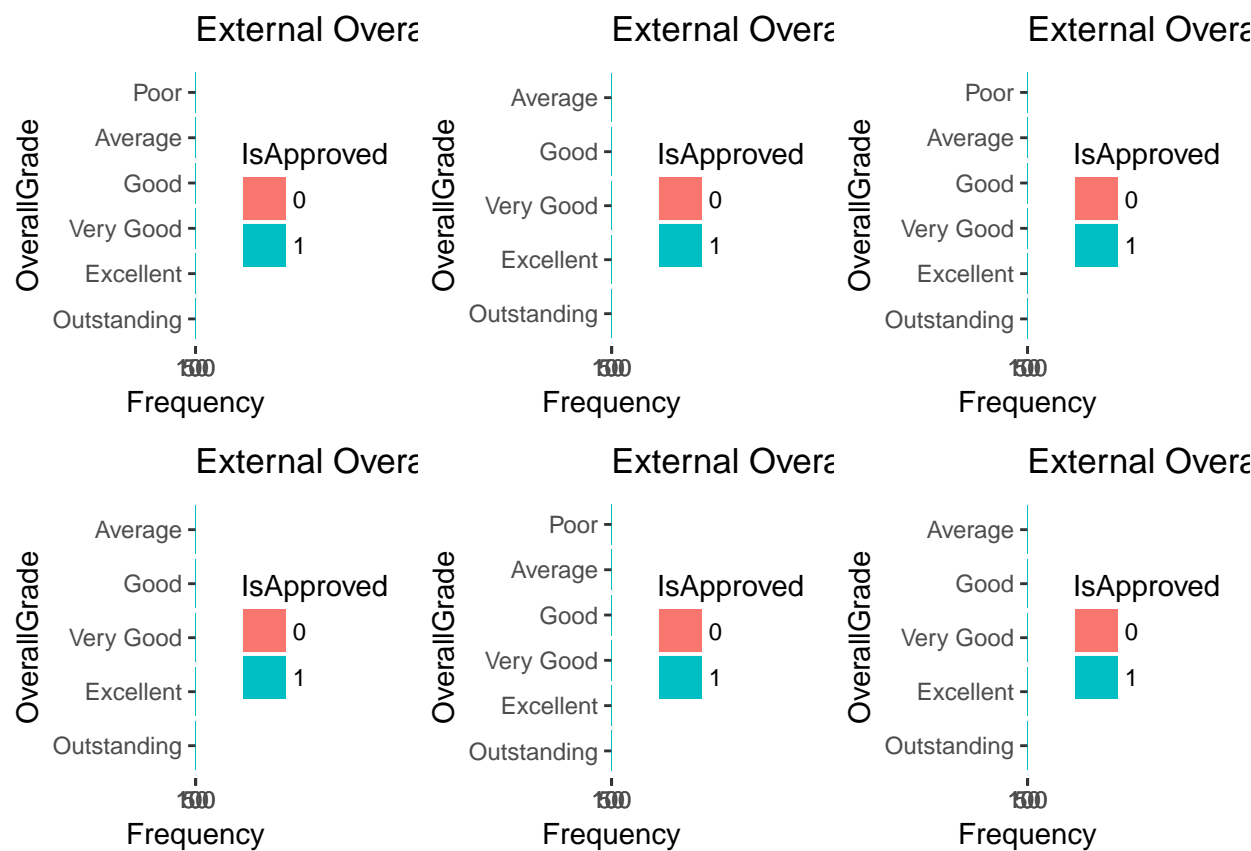
**Relationship between ApplicantTrack and IsApproved in the External Review Step**



External Applicant Track vs. IsApproved; All Data

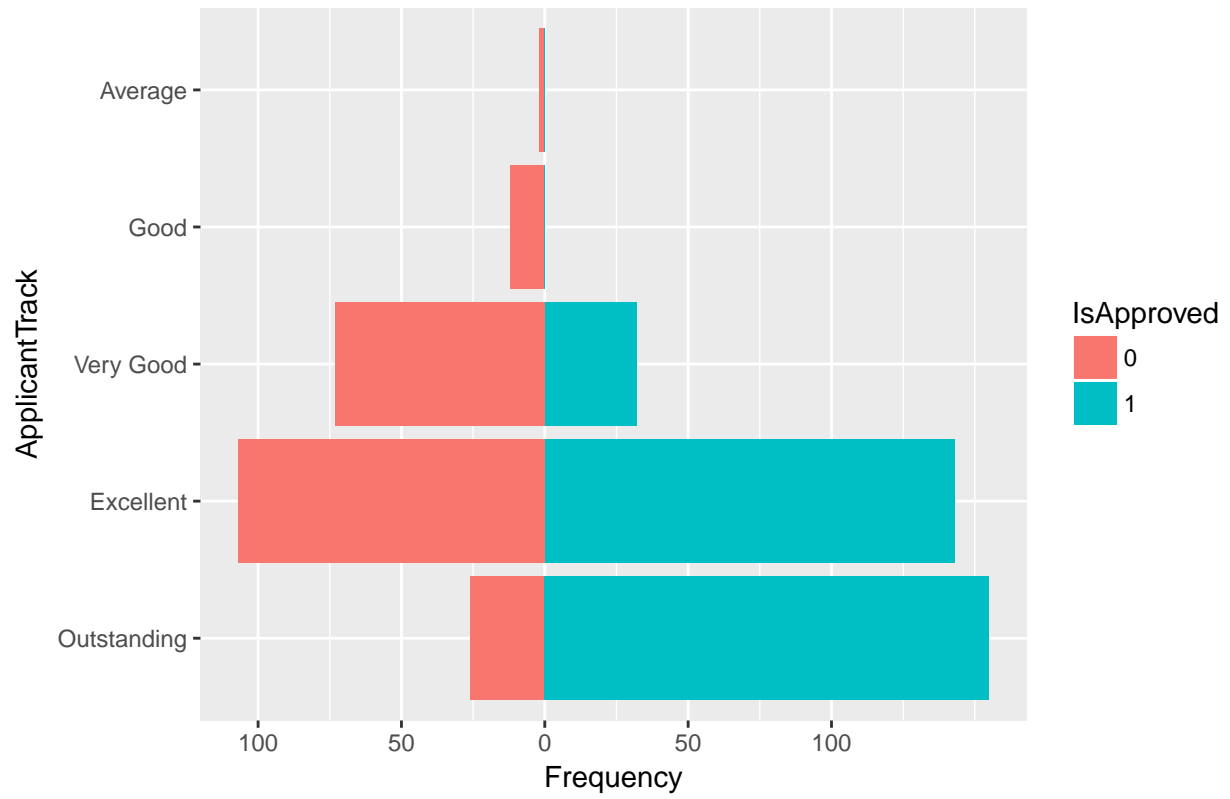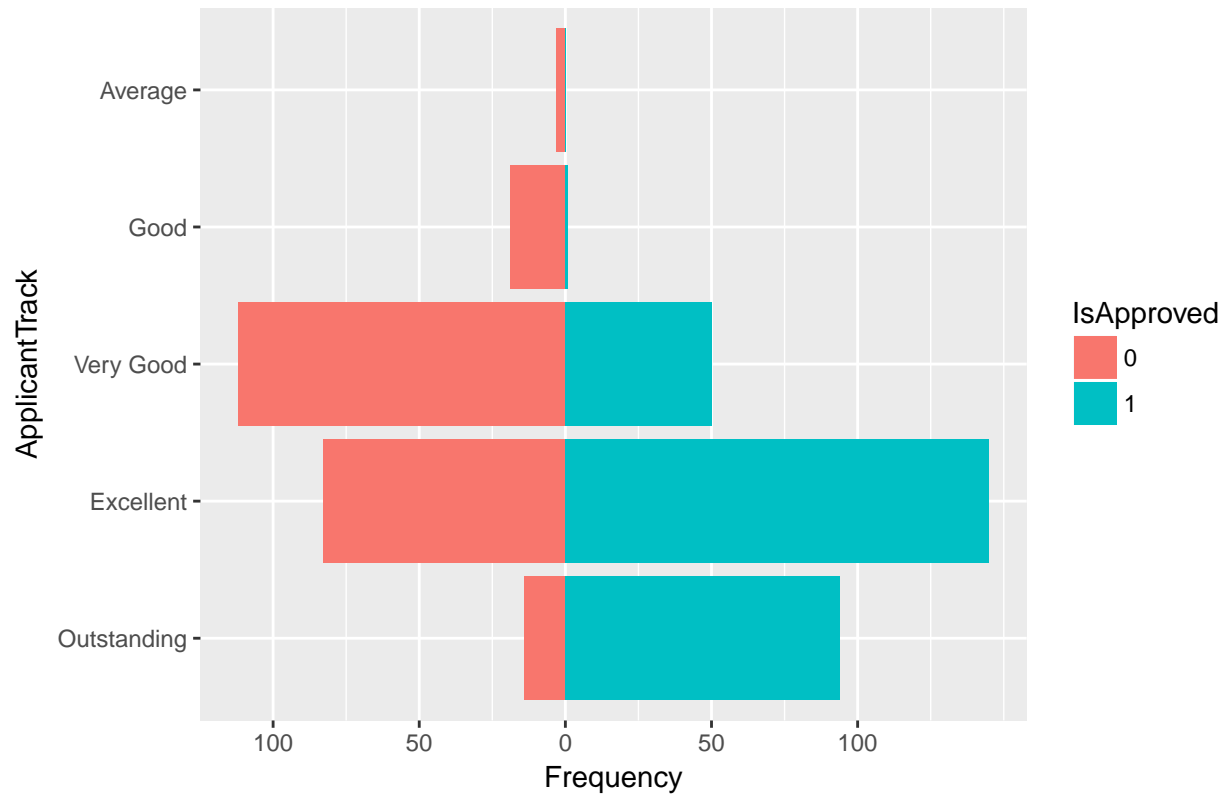External Applicant Track vs. IsApproved, Just Female
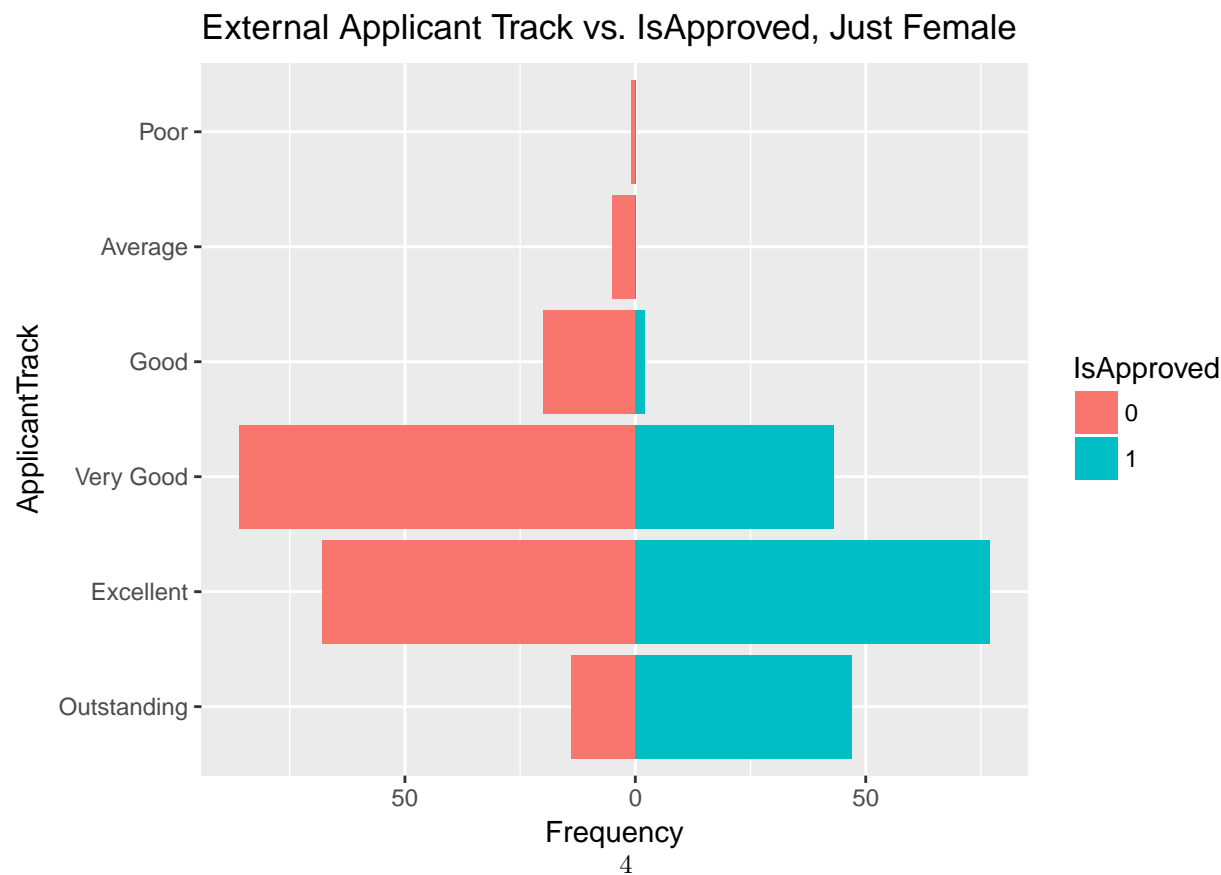
External Applicant Track vs. IsApproved, Just Male

External Applicant Track vs. IsApproved, Div1
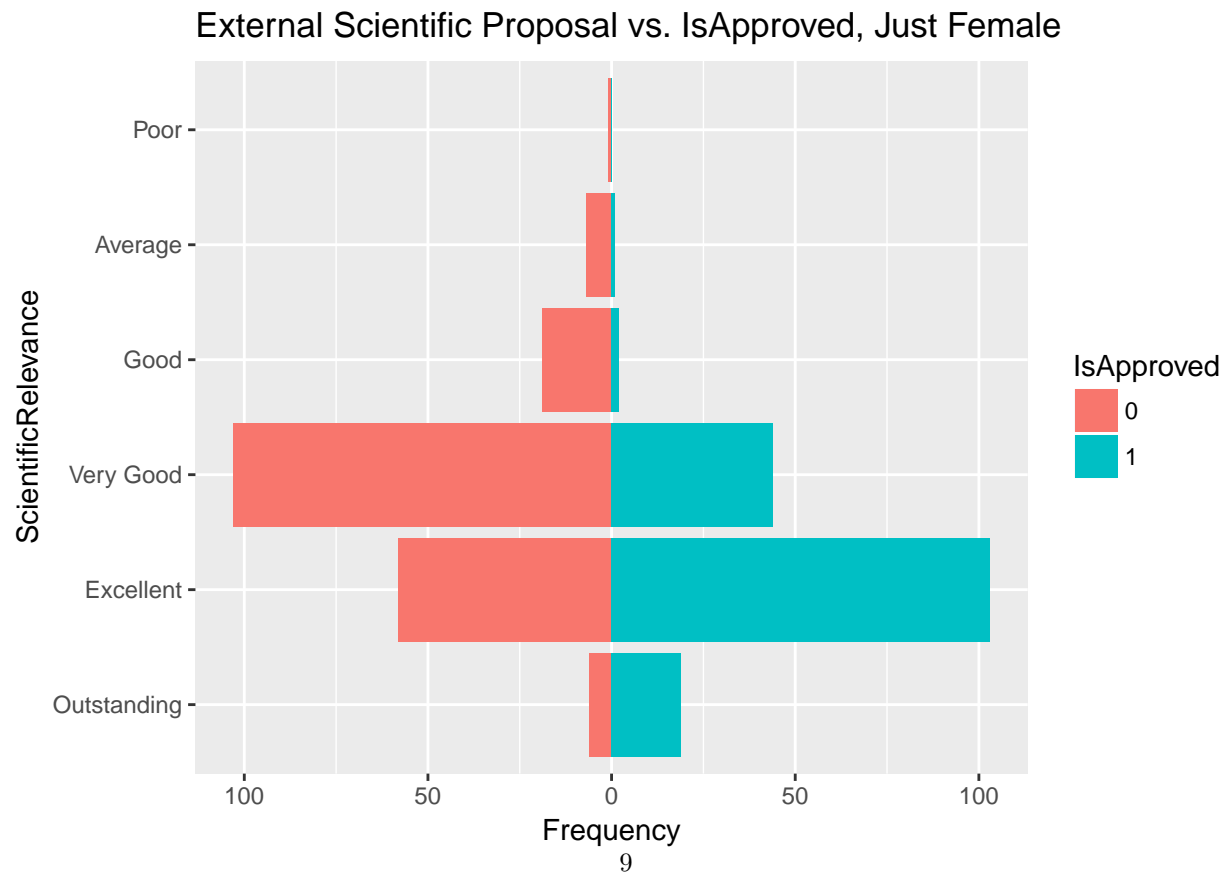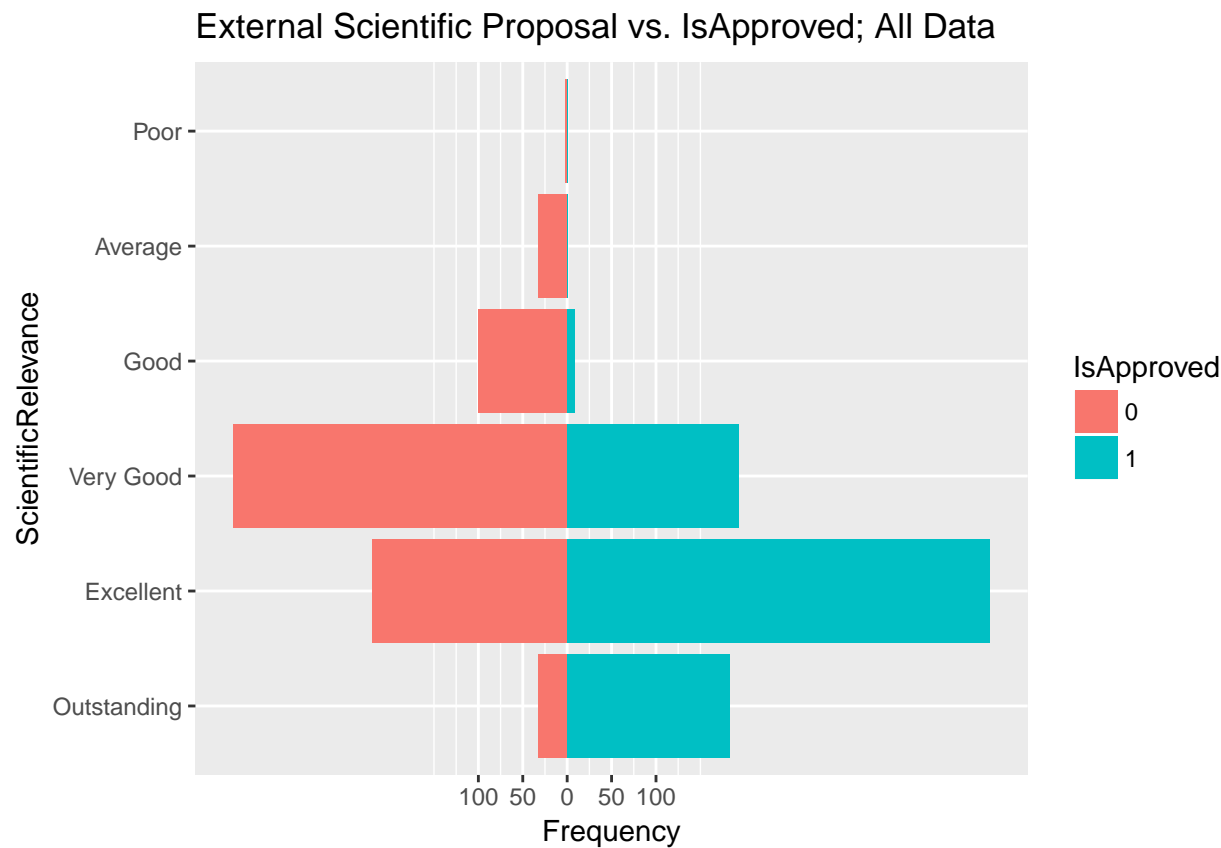
External Applicant Track vs. IsApproved, Div2
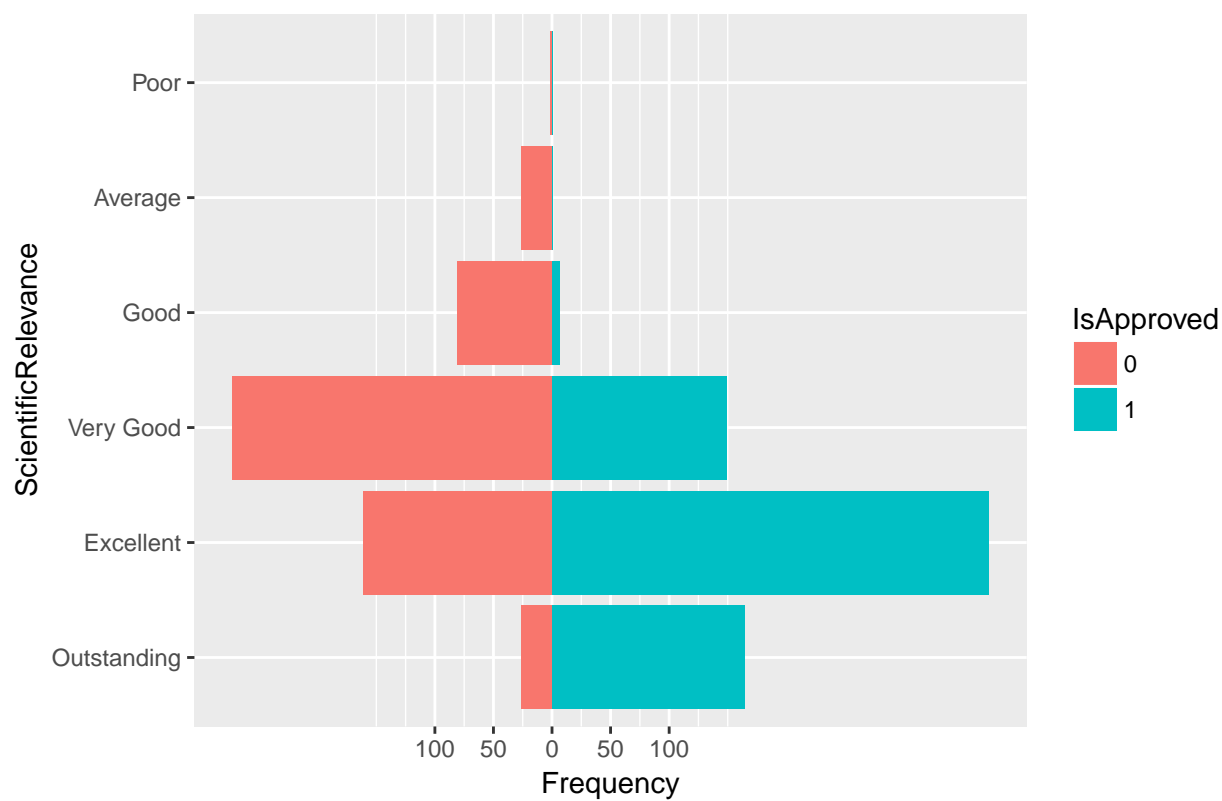
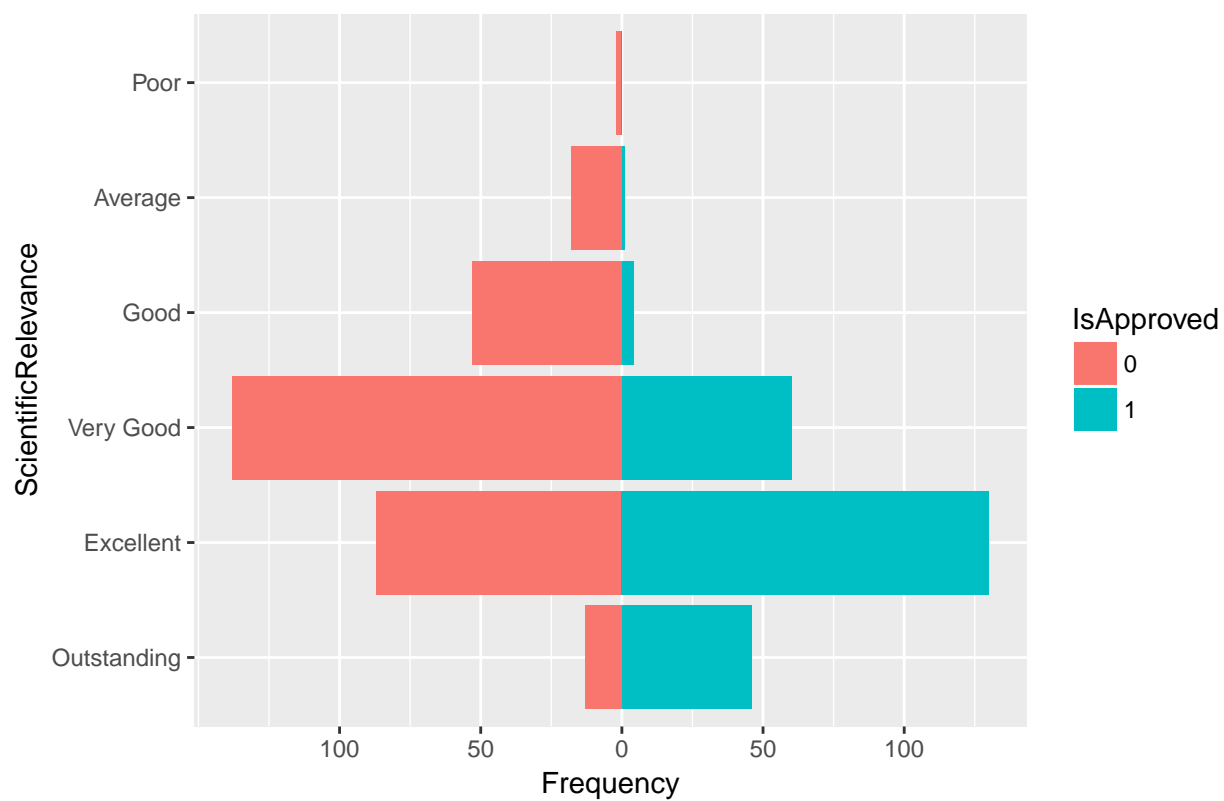External Applicant Track vs. IsApproved, Div3

**Relationship between ScientificProposal and IsApproved in the External Review Step**



External Scientific Proposal vs. IsApproved; All Data

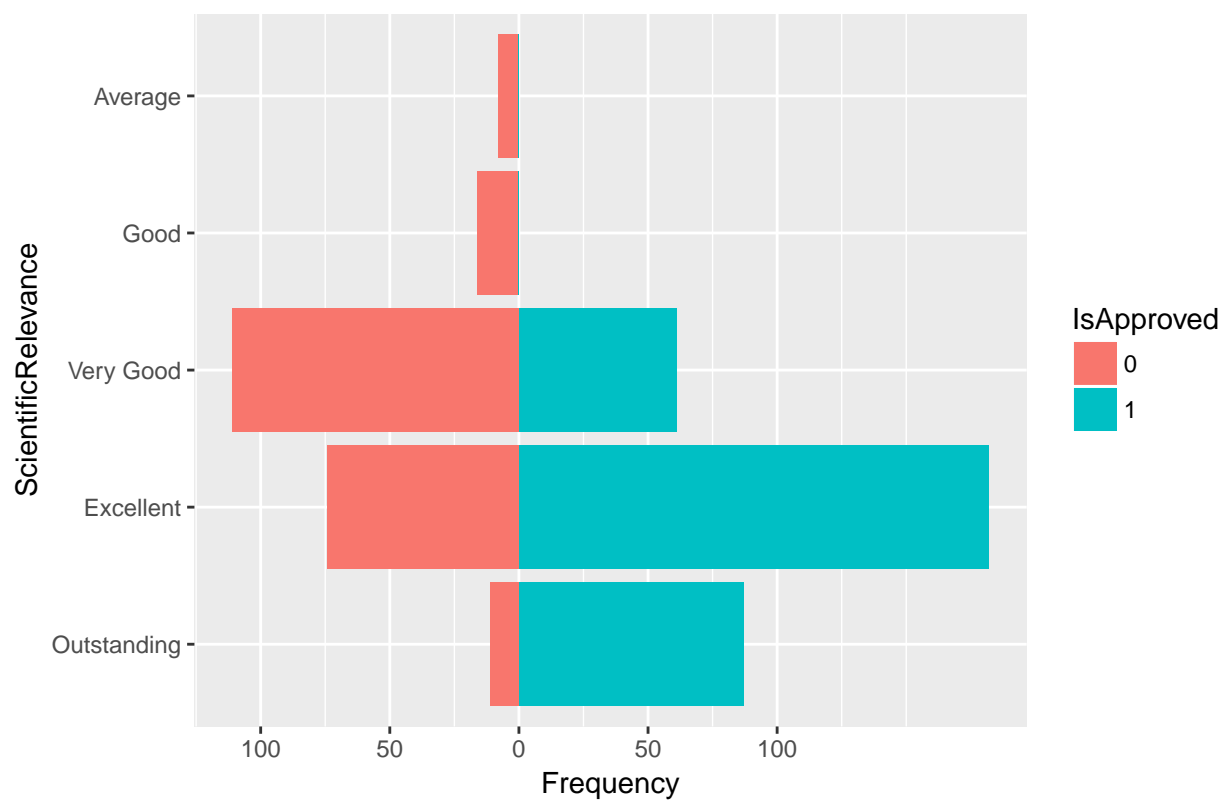External Scientific Proposal vs. IsApproved, Just Female

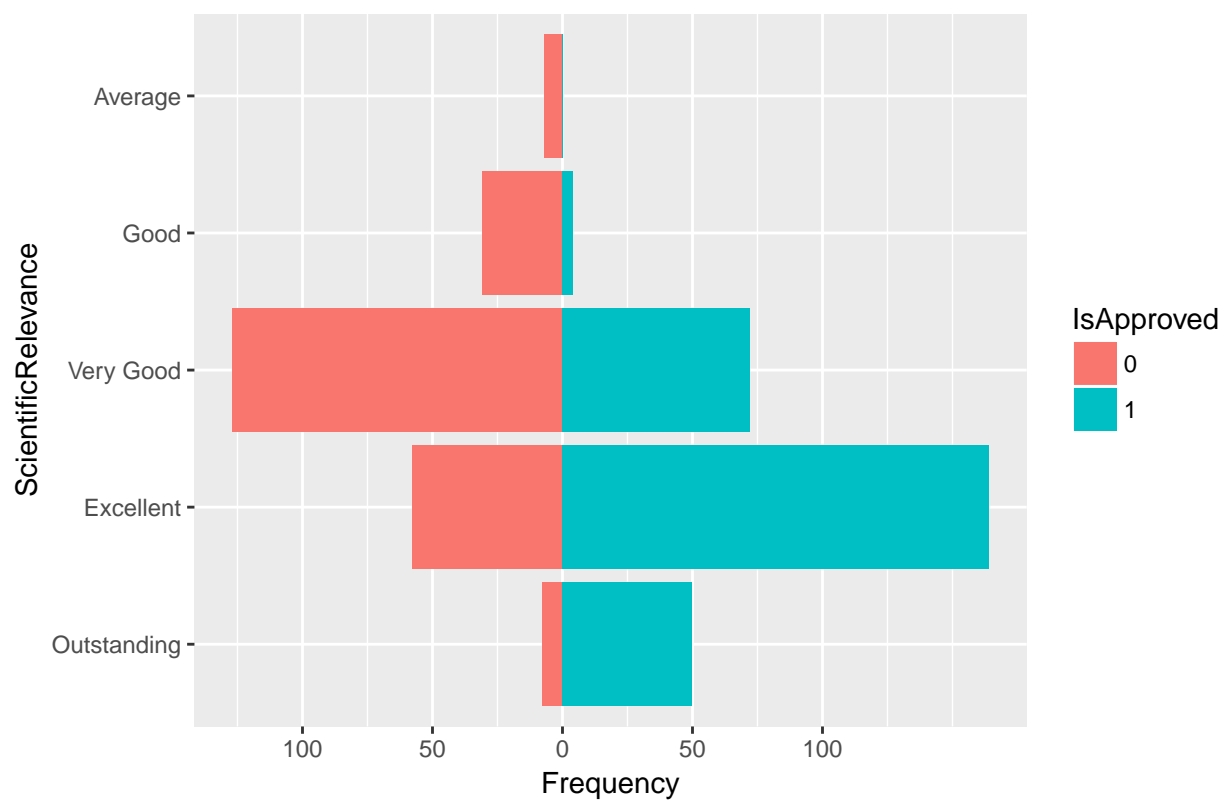External Scientific Proposal vs. IsApproved, Just Male

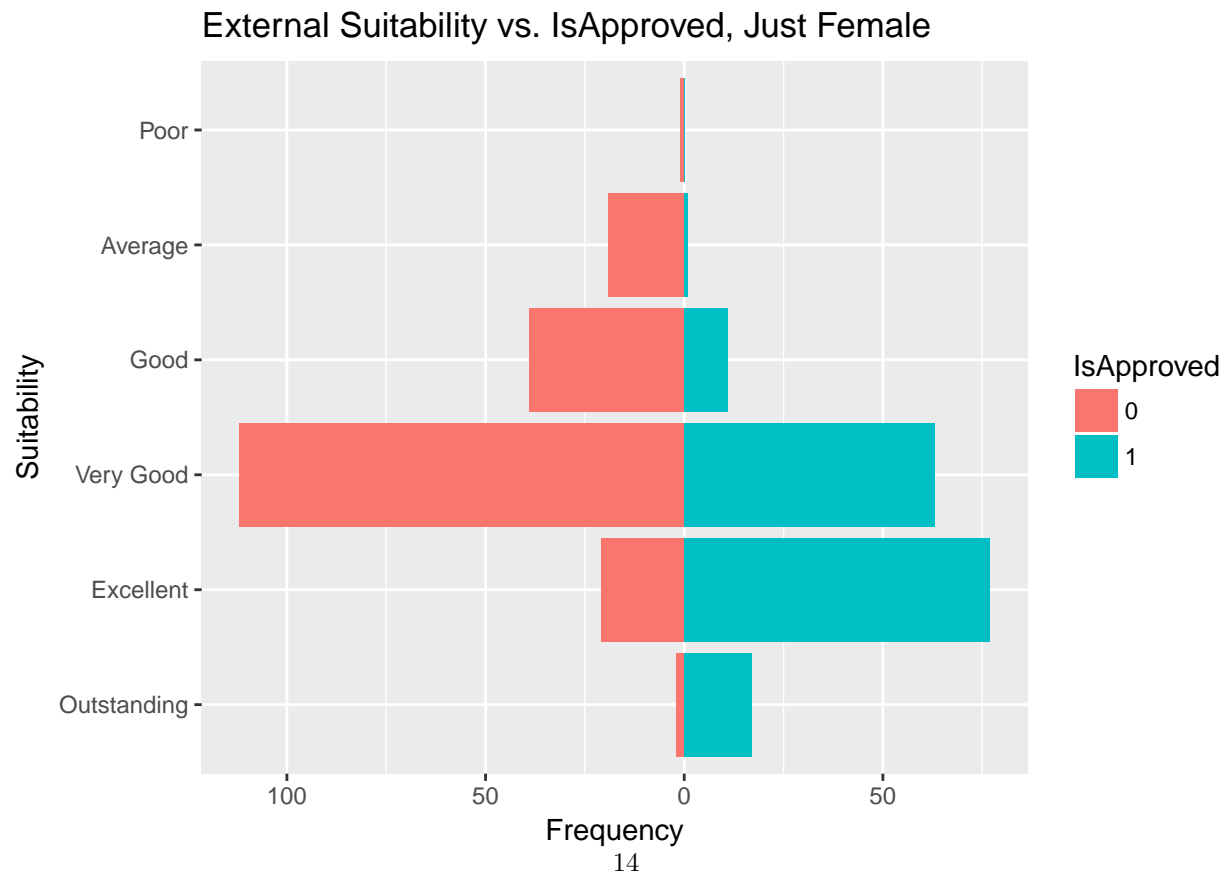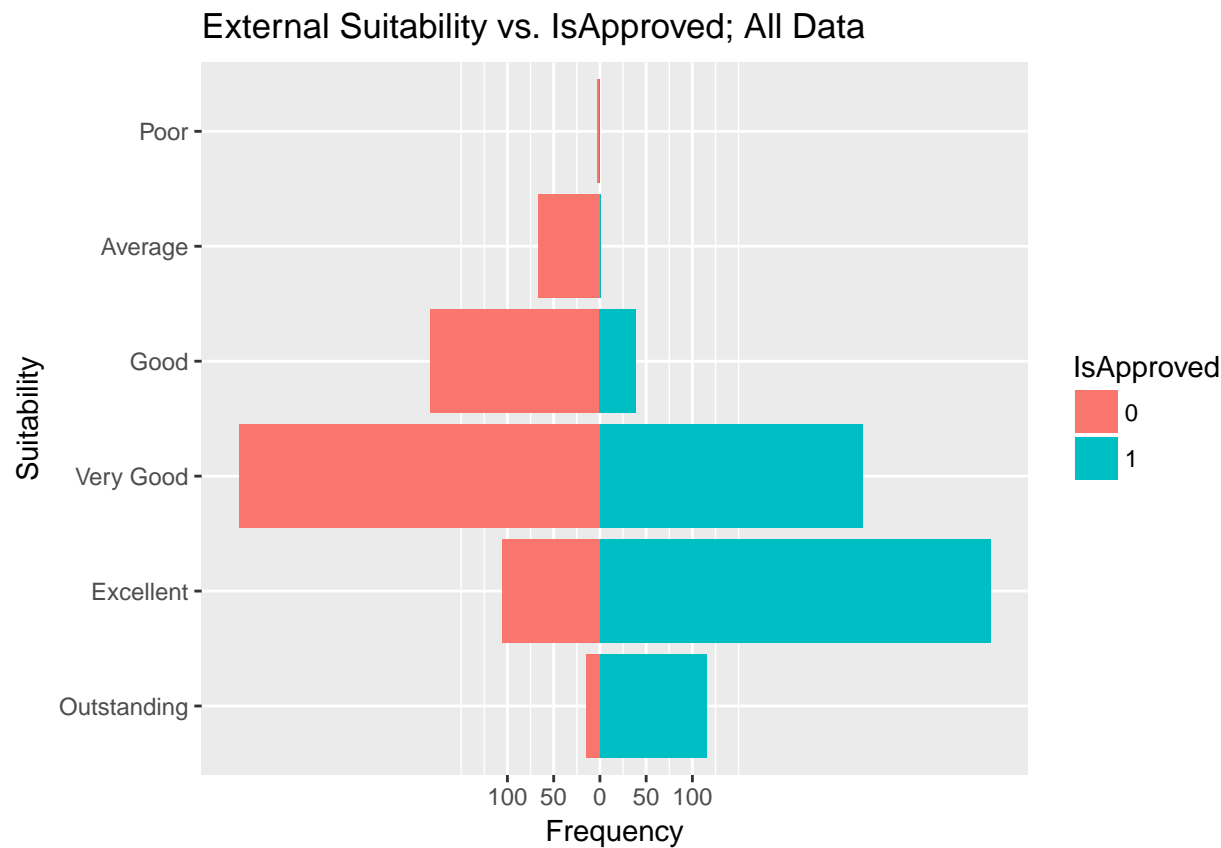External Scientific Proposal vs. IsApproved, Div1
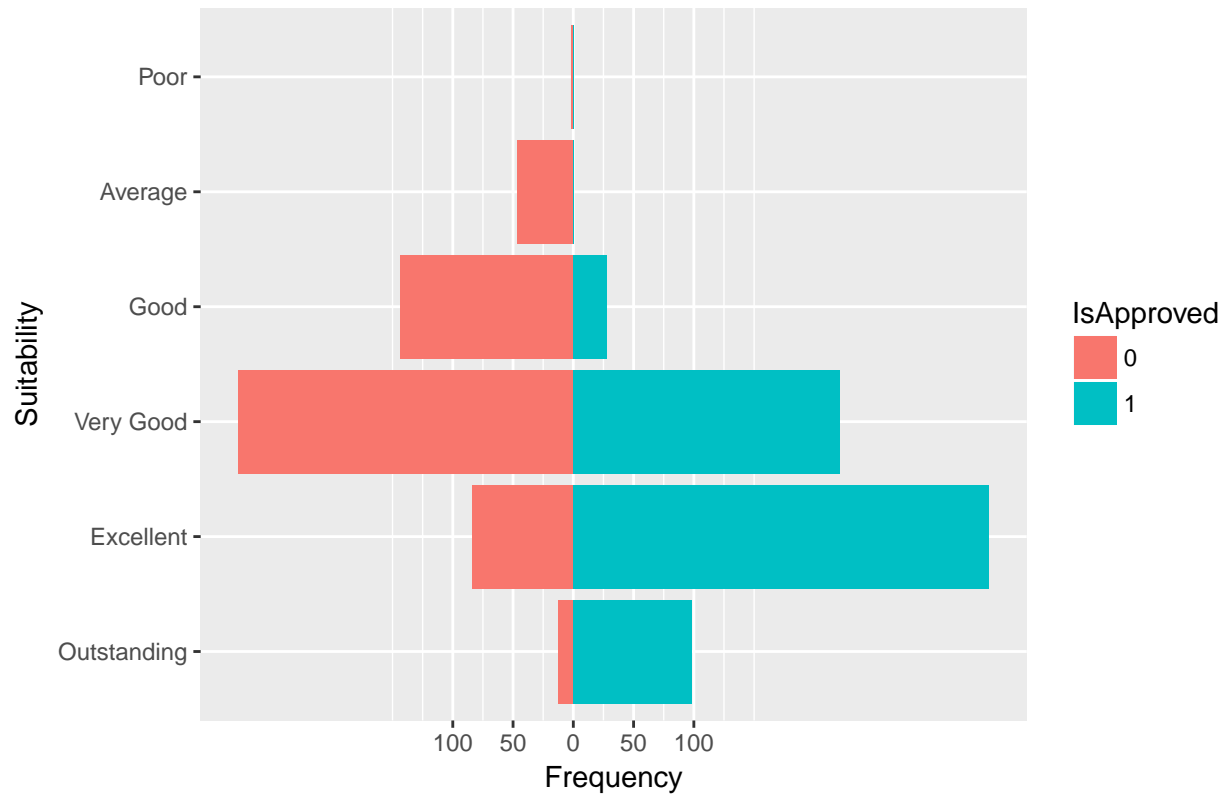
External Scientific Proposal vs. IsApproved, Div2

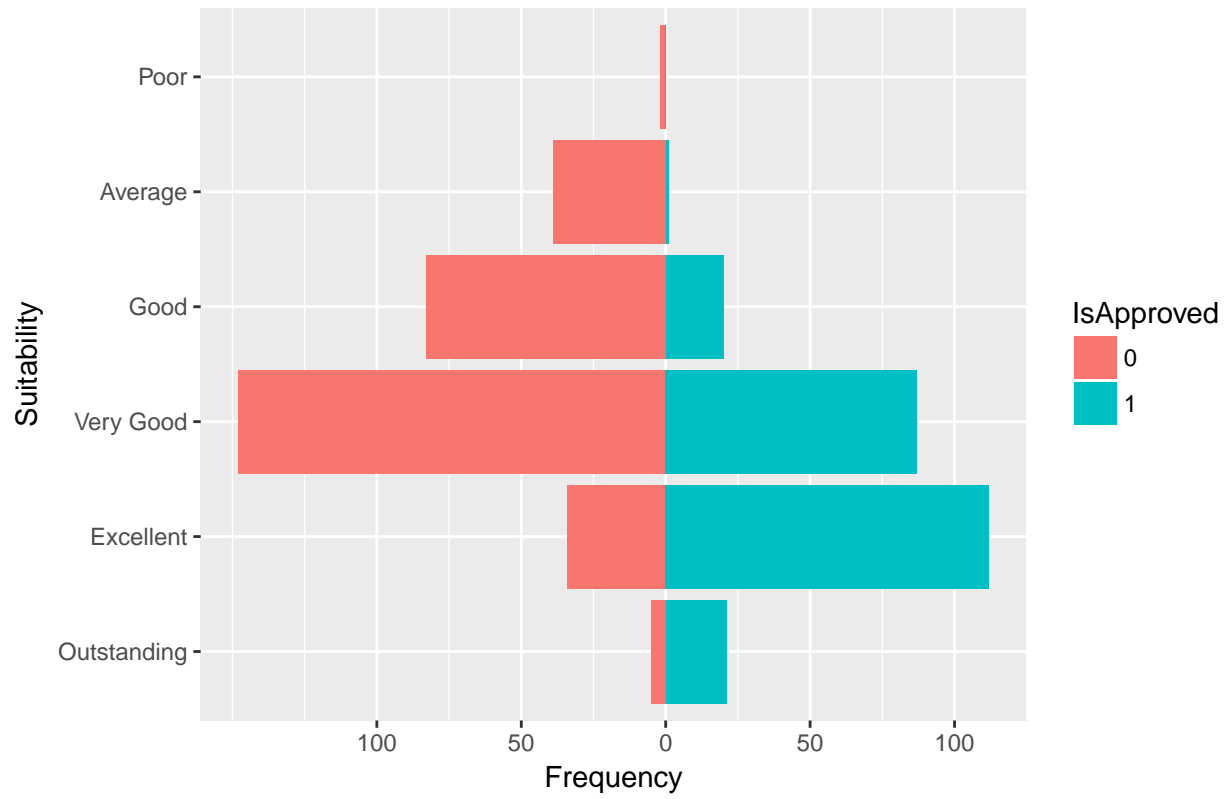External Scientific Proposal vs. IsApproved, Div3

# Relationship between Suitability and IsApproved in the External Review Step

## External Suitability vs. IsApproved; All Data



## External Suitability vs. IsApproved, Just Female

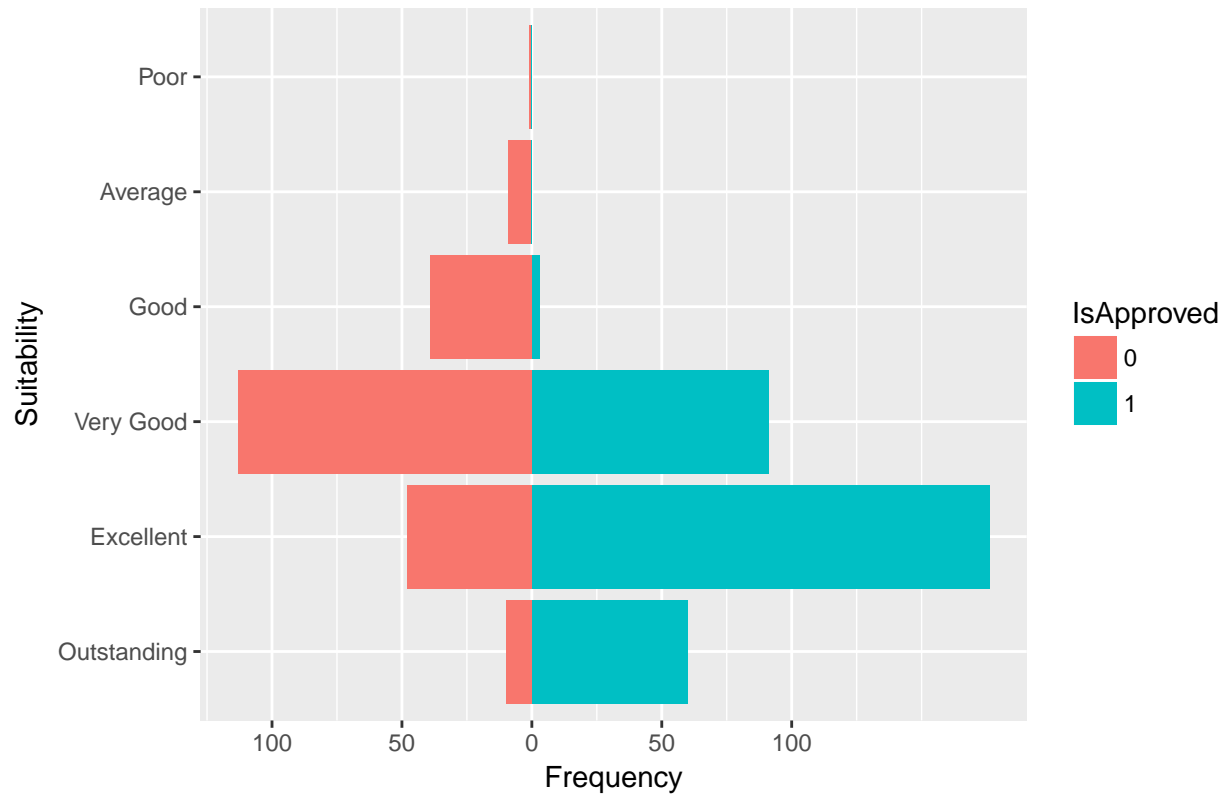External Suitability vs. IsApproved, Just Male

External Suitability vs. IsApproved, Div1

External Suitability vs. IsApproved, Div2

External Suitability vs. IsApproved, Div3
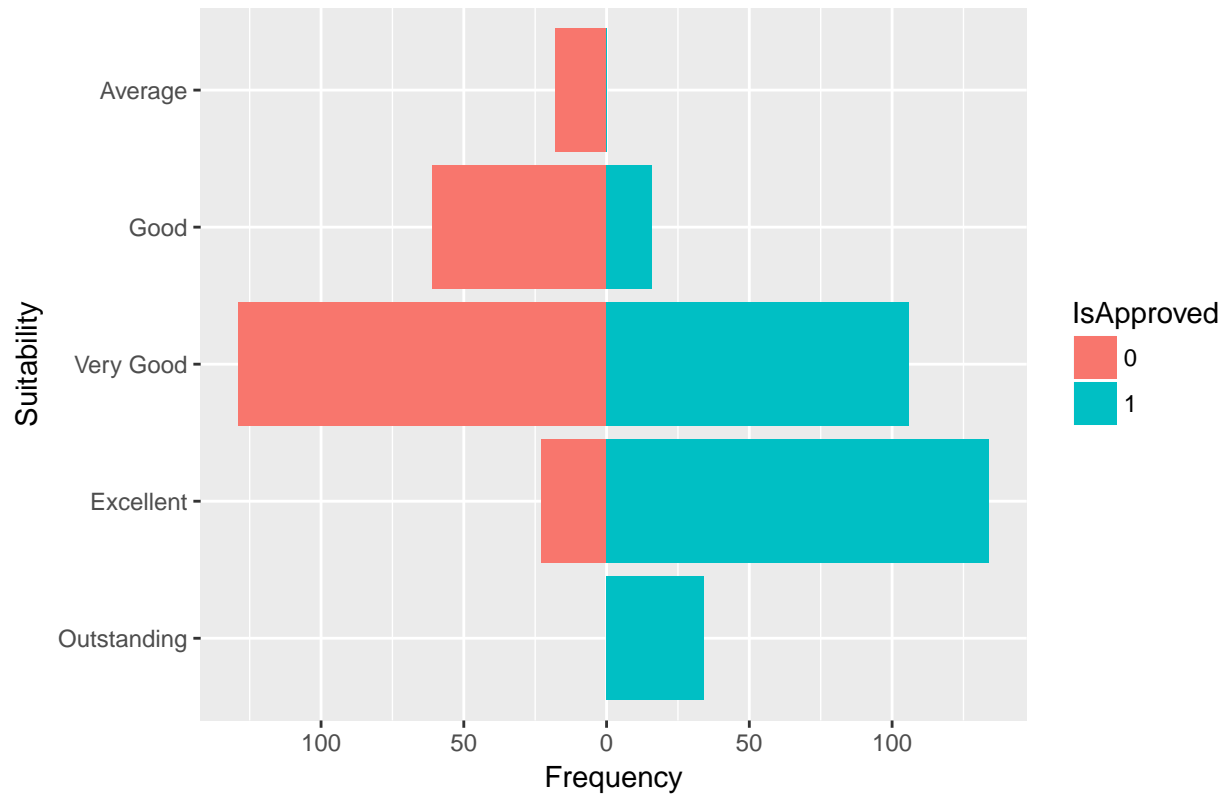
**Relationship between Ranking and IsApproved in the internal Review Step**



internal Overall Grade vs. IsApproved; All Data



internal Overall Grade vs. IsApproved, Just Female
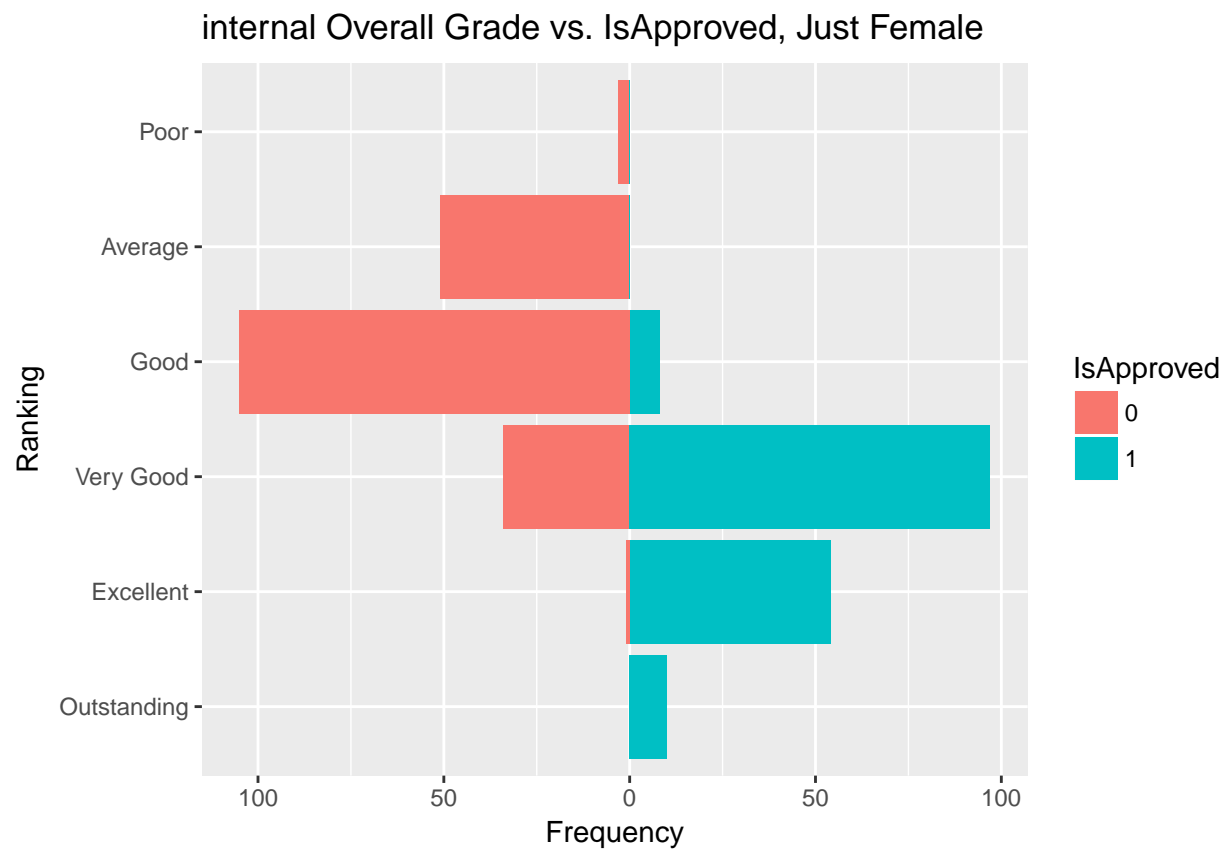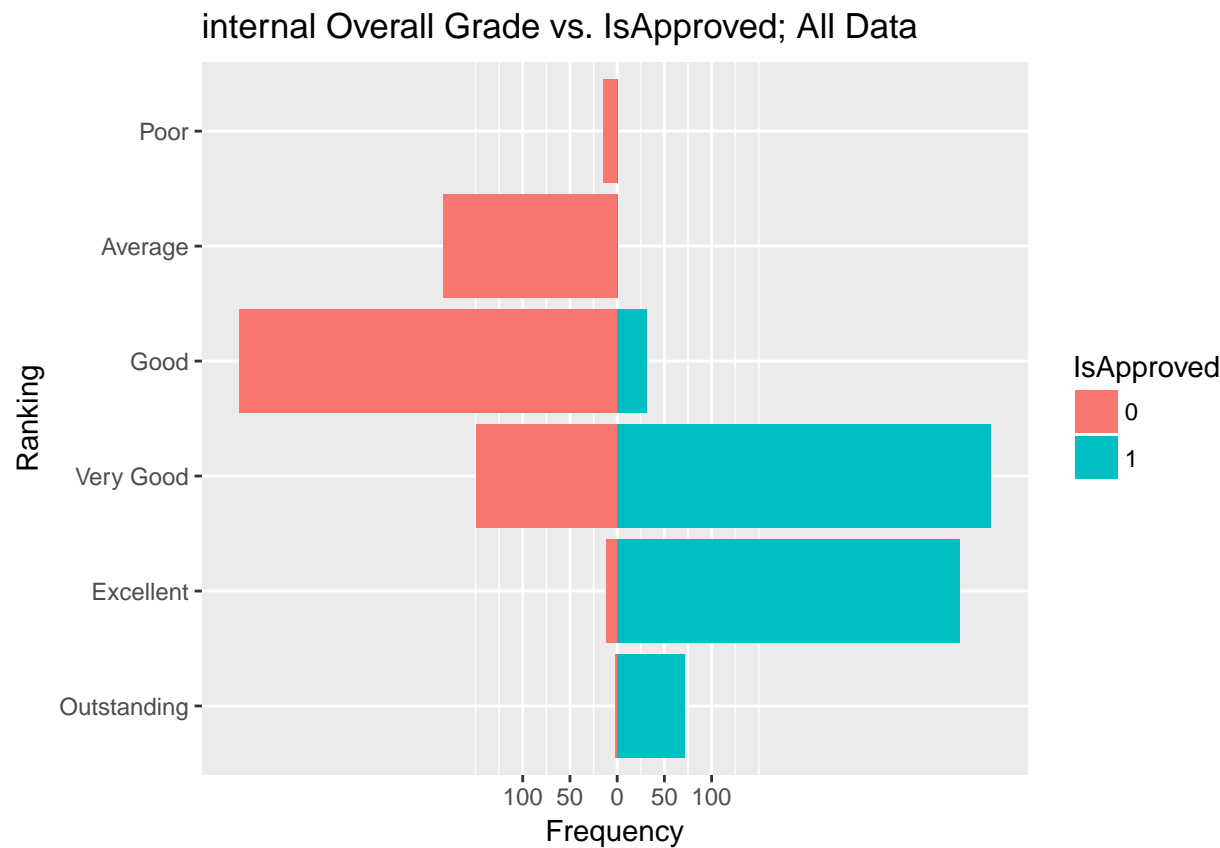
internal Overall Grade vs. IsApproved, Just Male
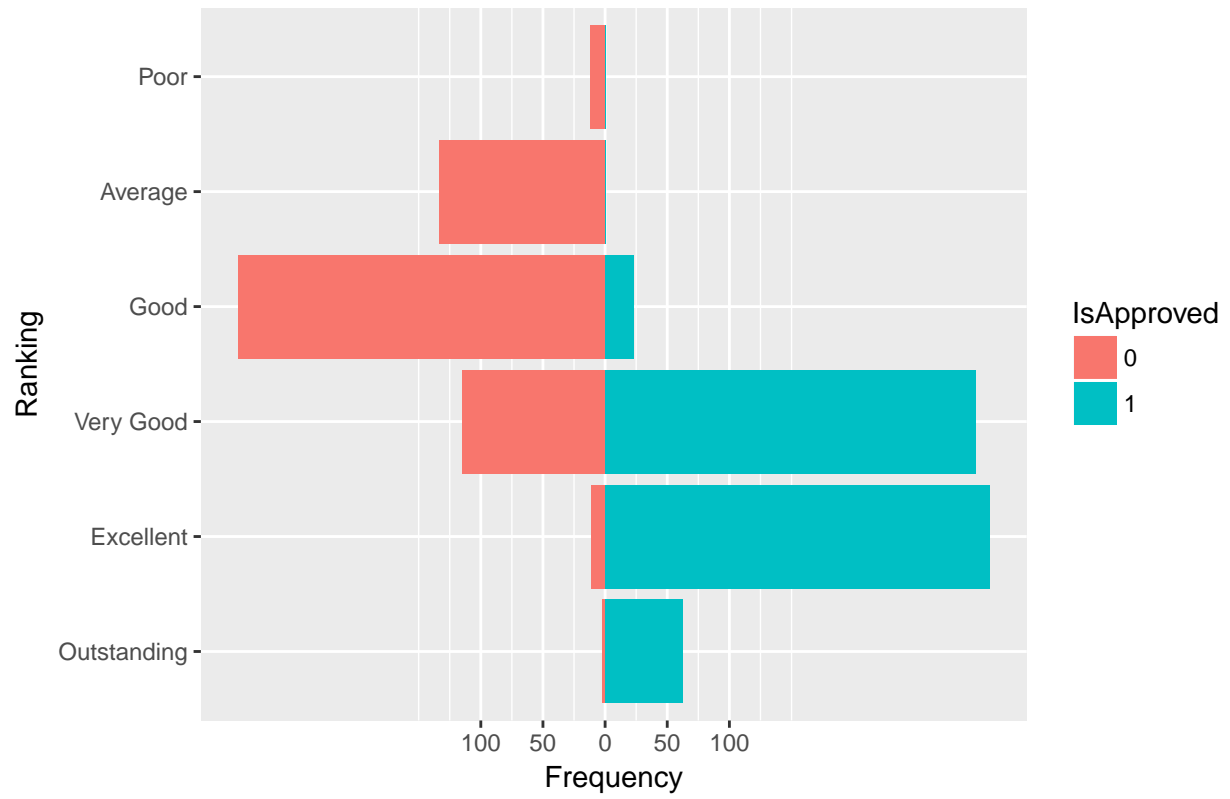
internal Overall Grade vs. IsApproved, Div1
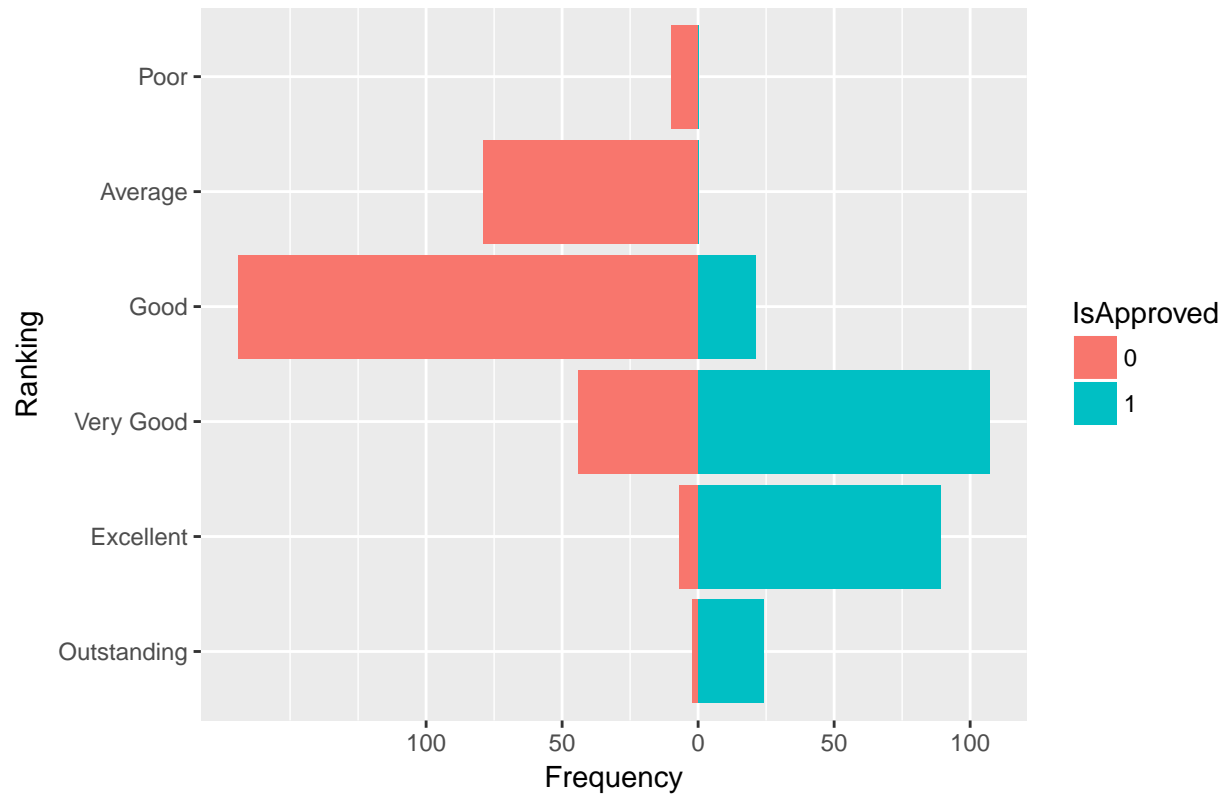
internal Overall Grade vs. IsApproved, Div2
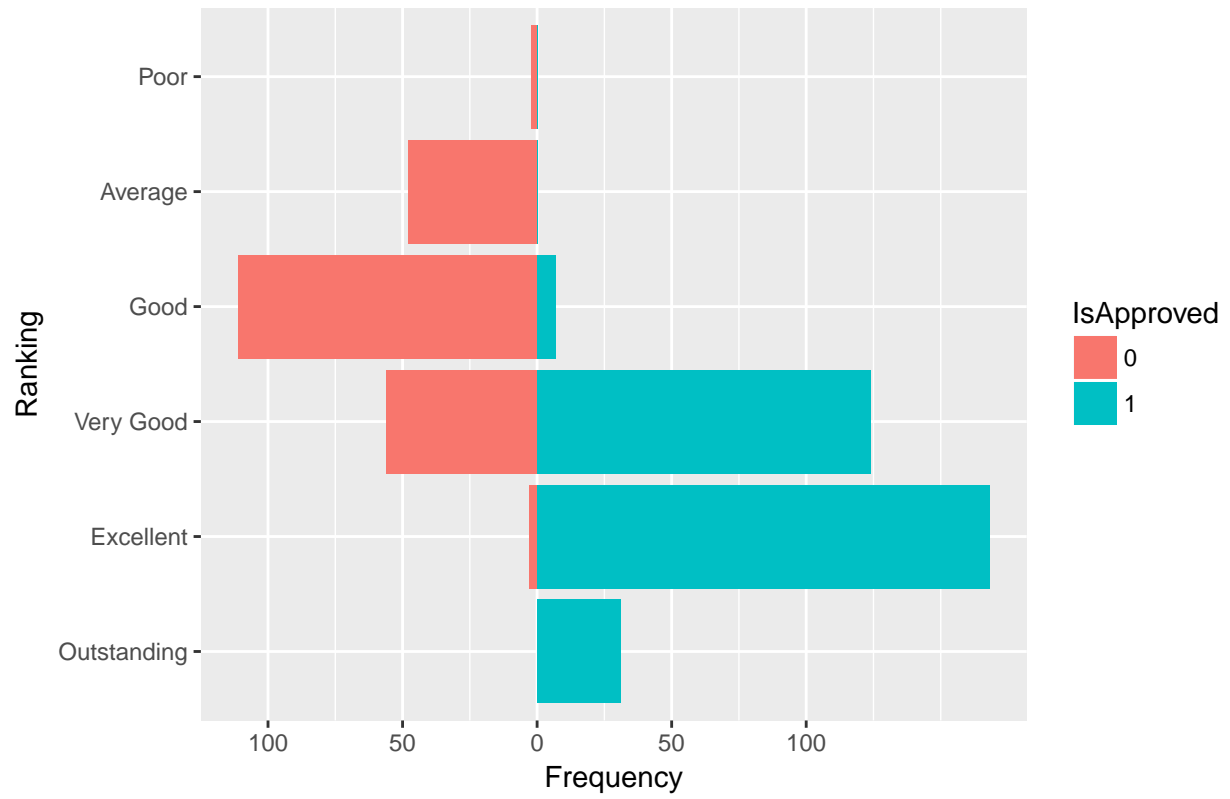
internal Overall Grade vs. IsApproved, Div3
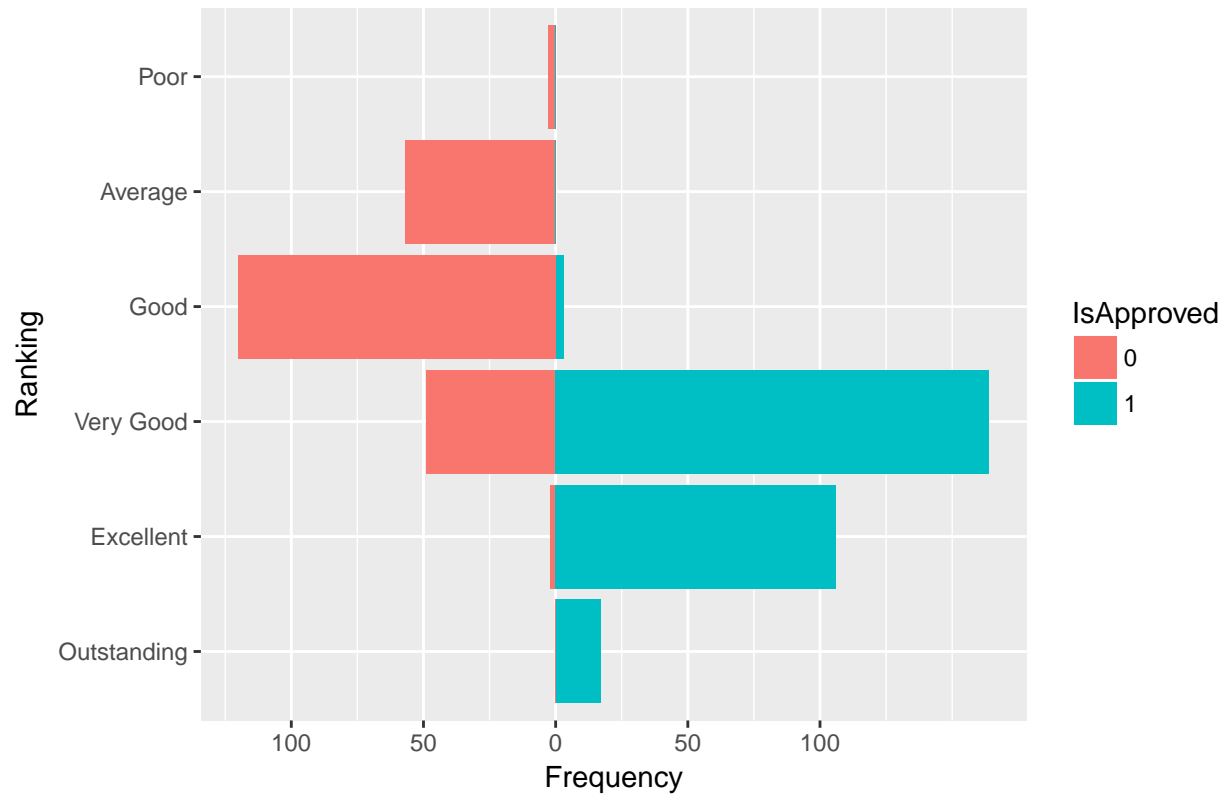
# Relationship between ApplicantTrack and IsApproved in the internal Review Step



internal Applicant Track vs. IsApproved; All Data



internal Applicant Track vs. IsApproved, Just Female
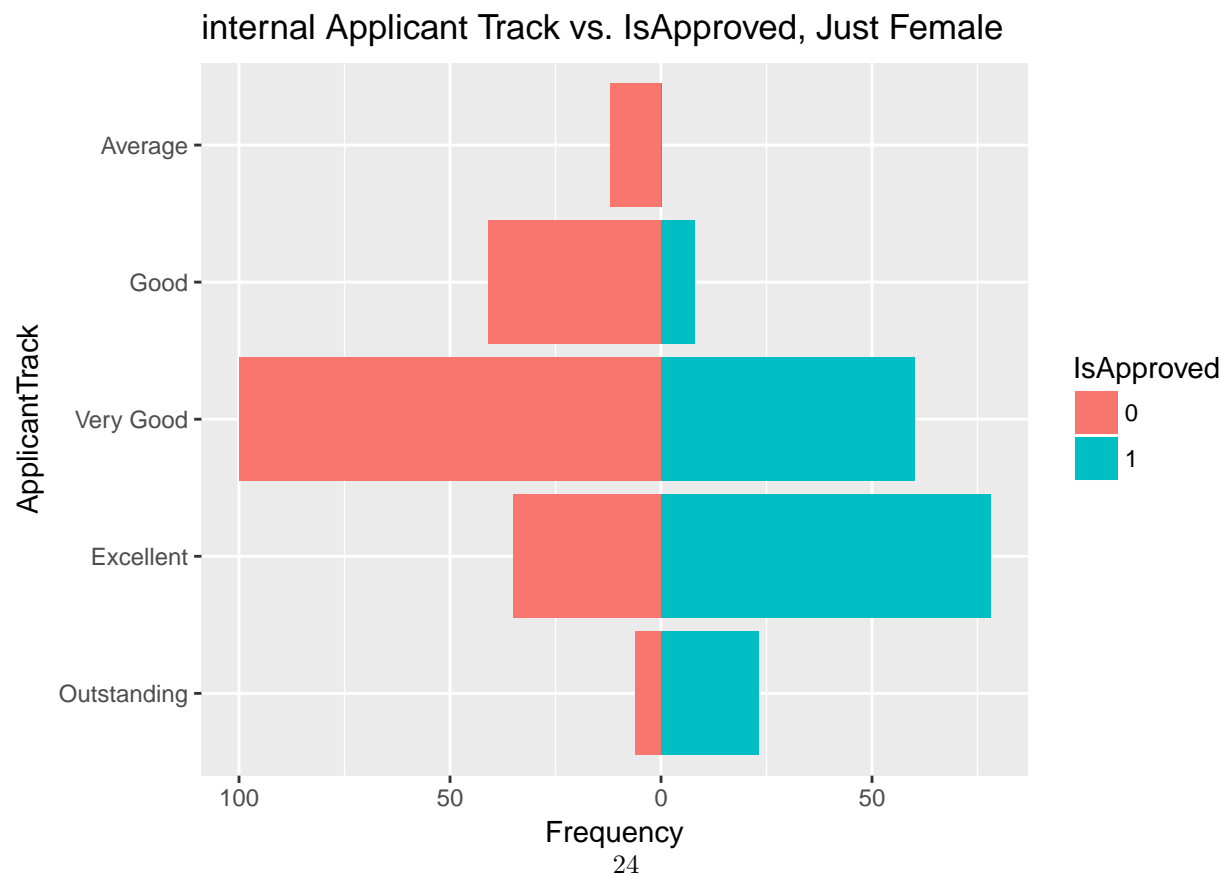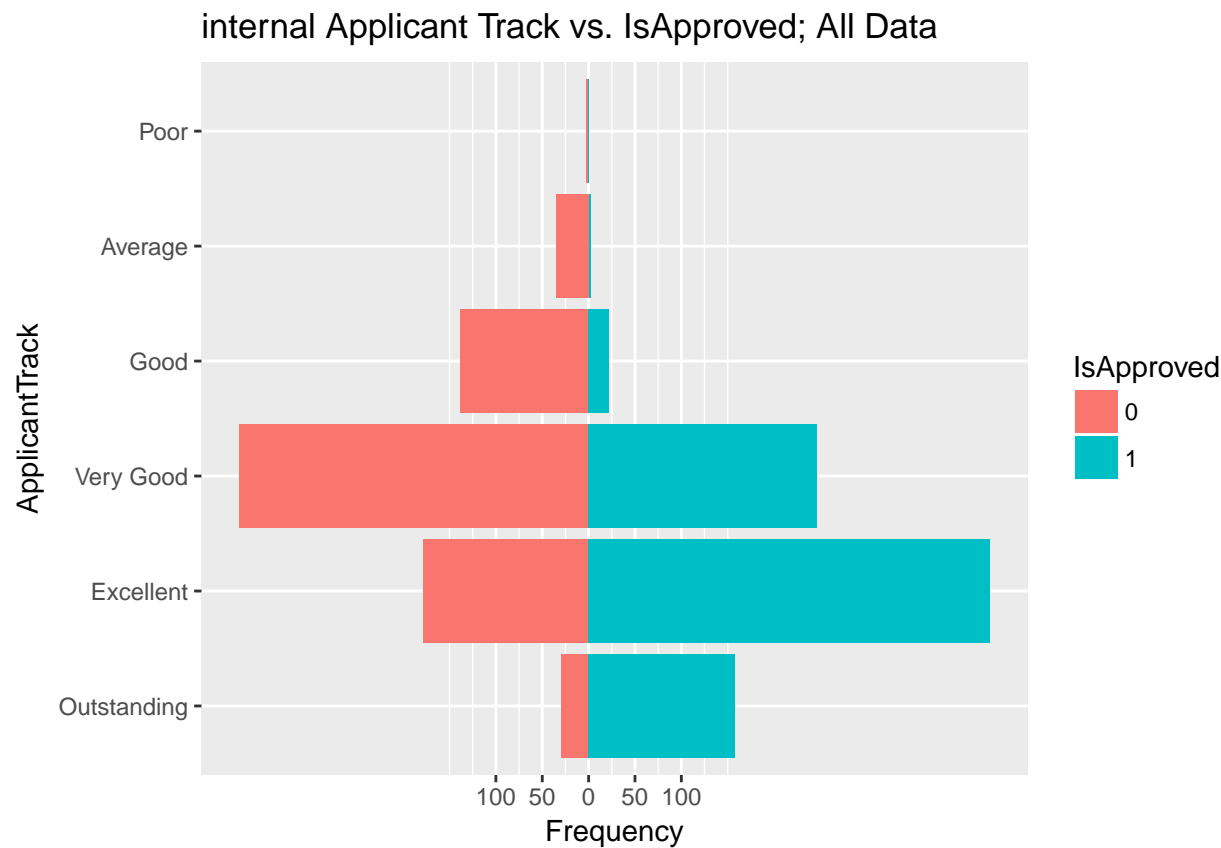
internal Applicant Track vs. IsApproved, Just Male
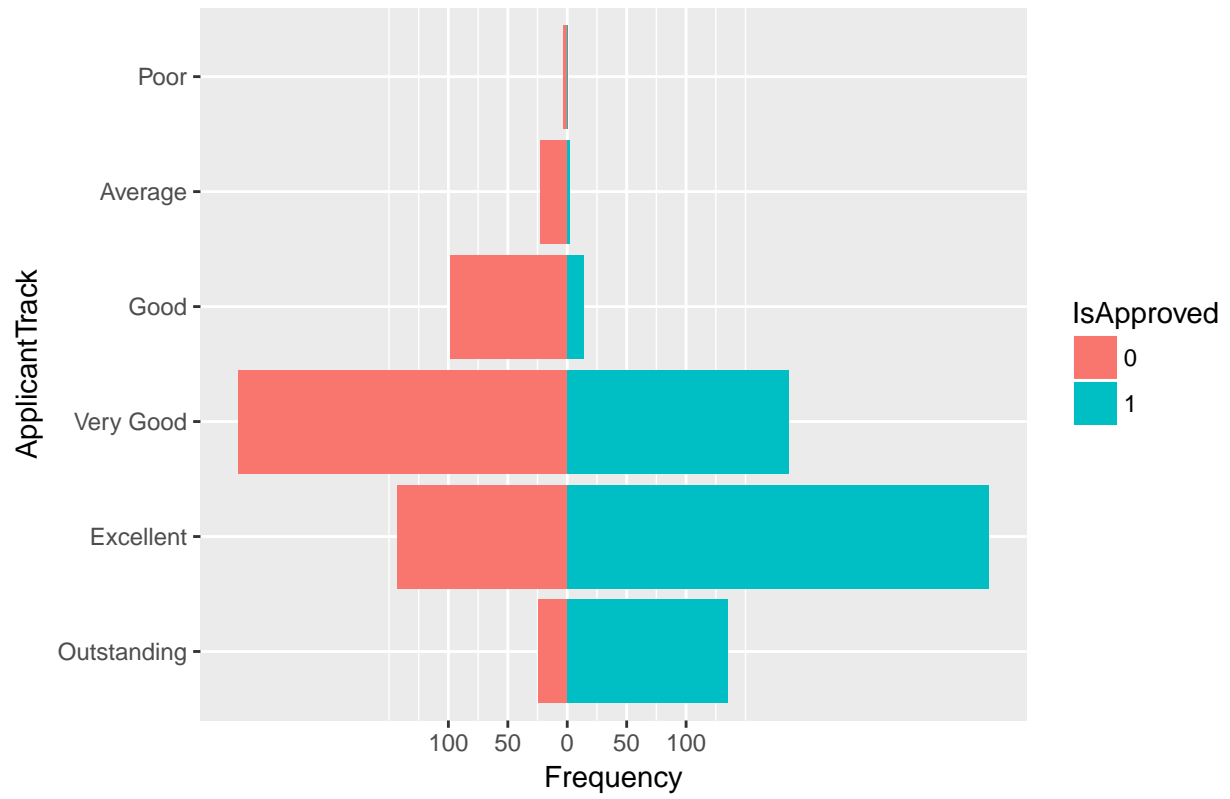
# internal Applicant Track vs. IsApproved, Div1
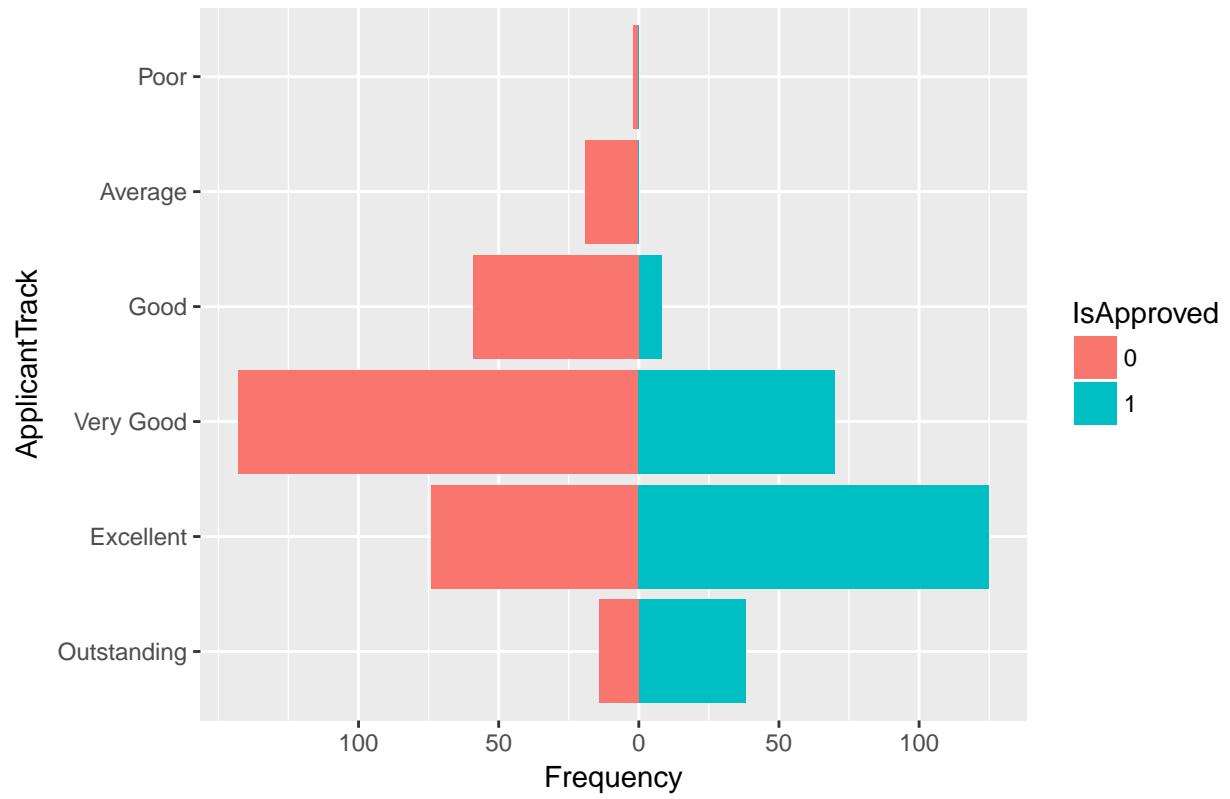
internal Applicant Track vs. IsApproved, Div2
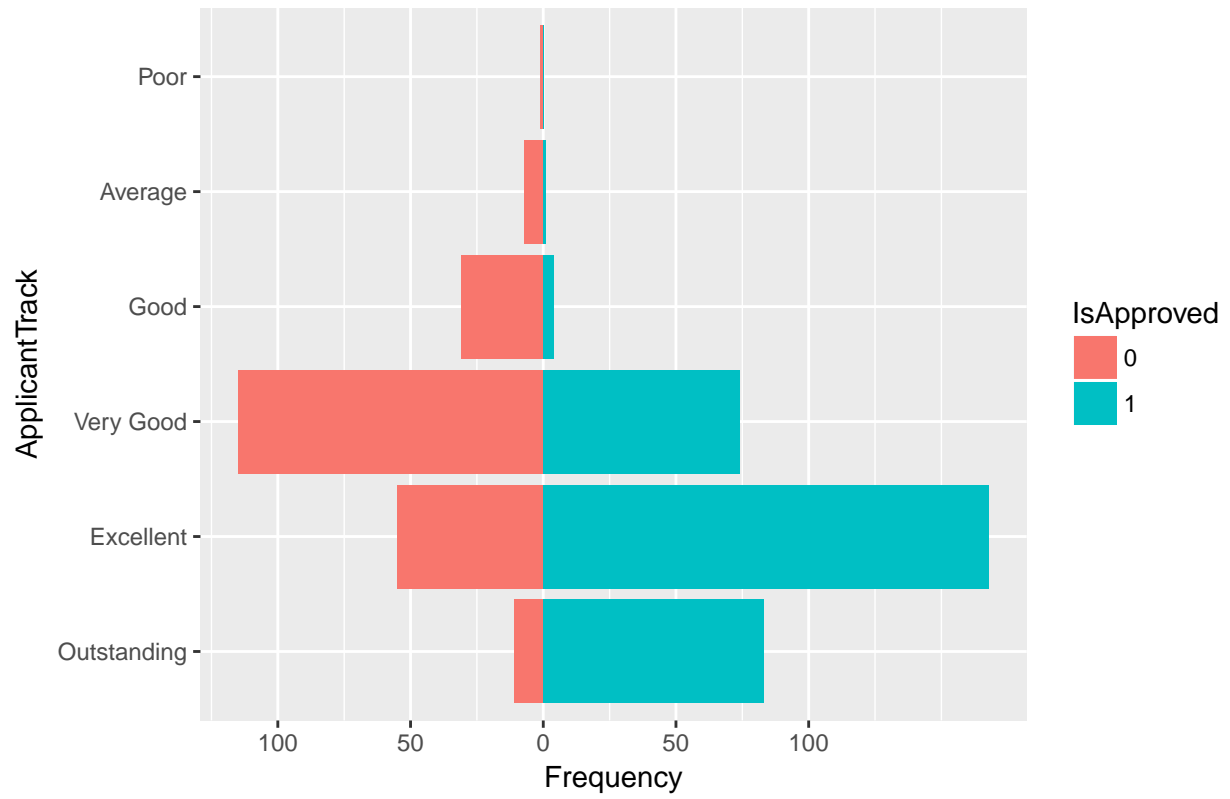
internal Applicant Track vs. IsApproved, Div3
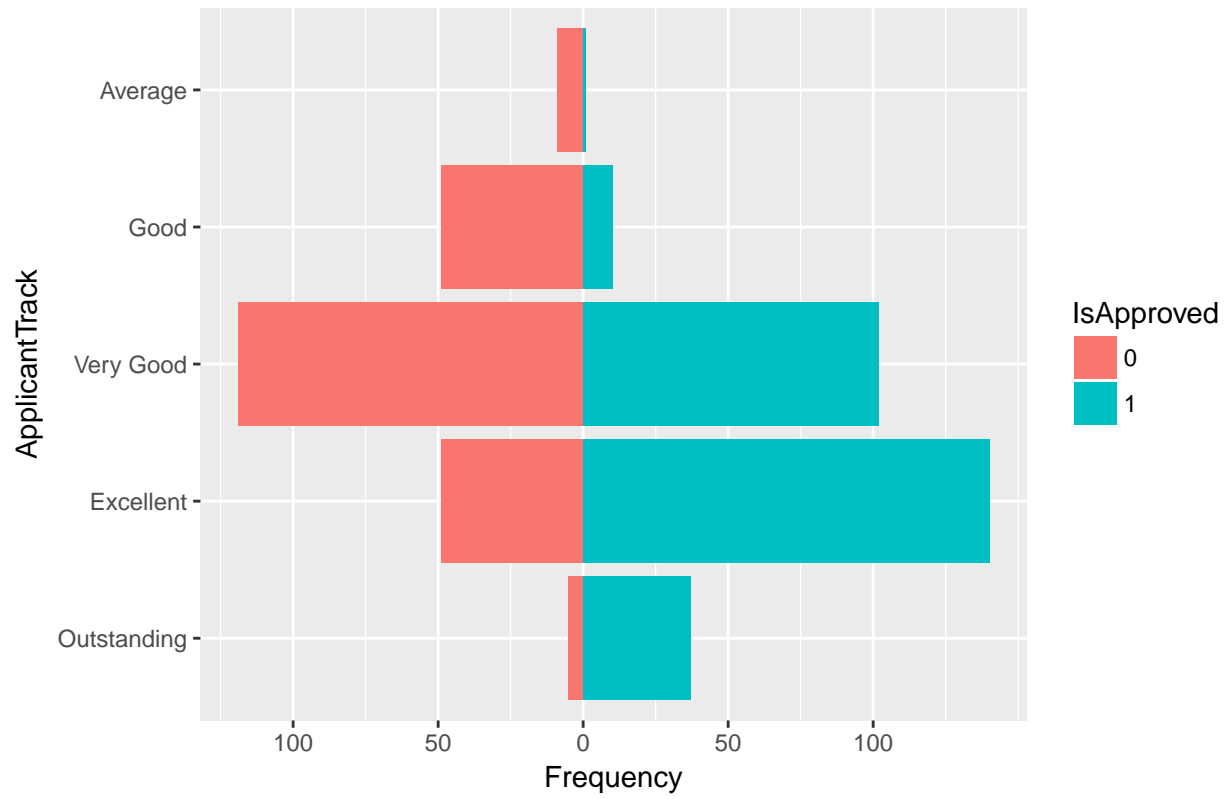
**Relationship between ScientificProposal and IsApproved in the internal Review Step**



Internal Scientific Proposal vs. IsApproved; All Data



Internal Scientific Proposal vs. IsApproved, Just Female

Internal Scientific Proposal vs. IsApproved, Just Male

Internal Scientific Proposal vs. IsApproved, Div1
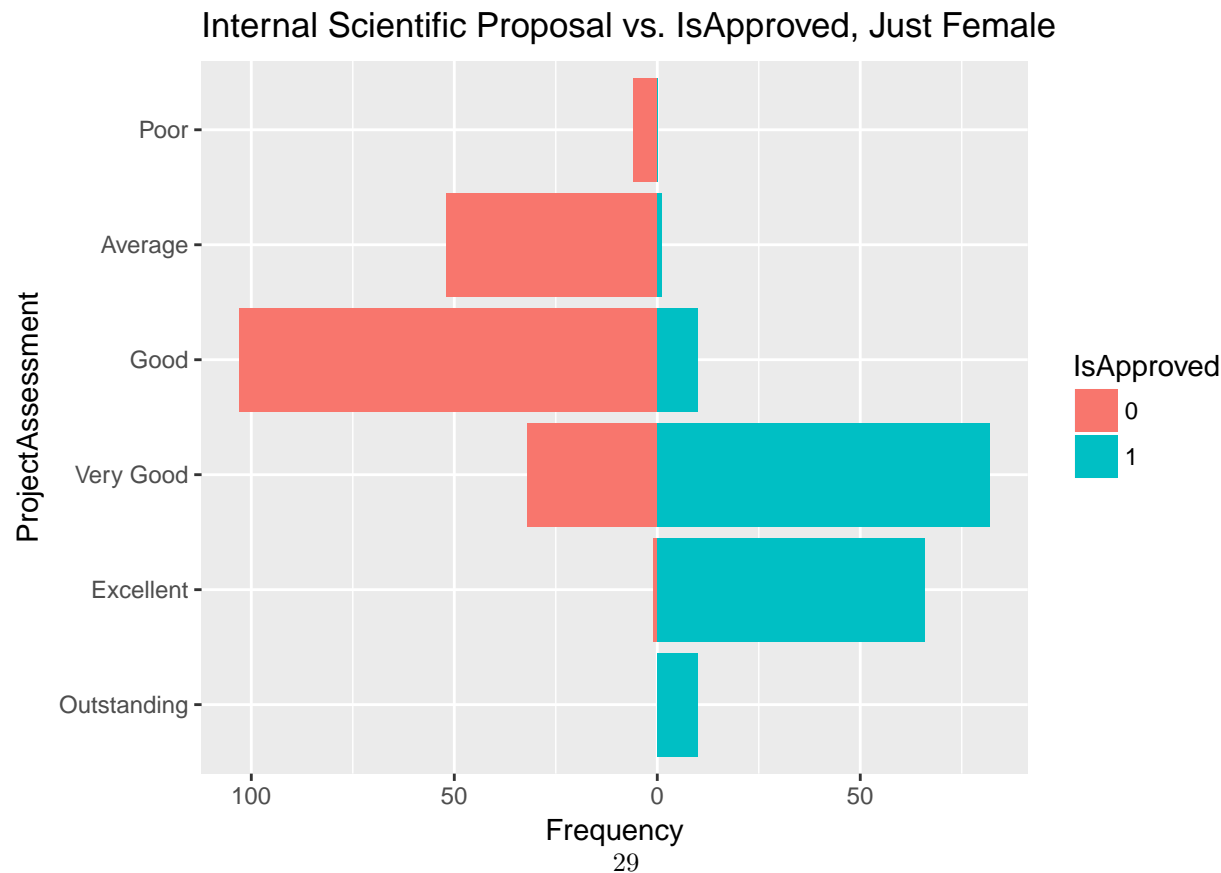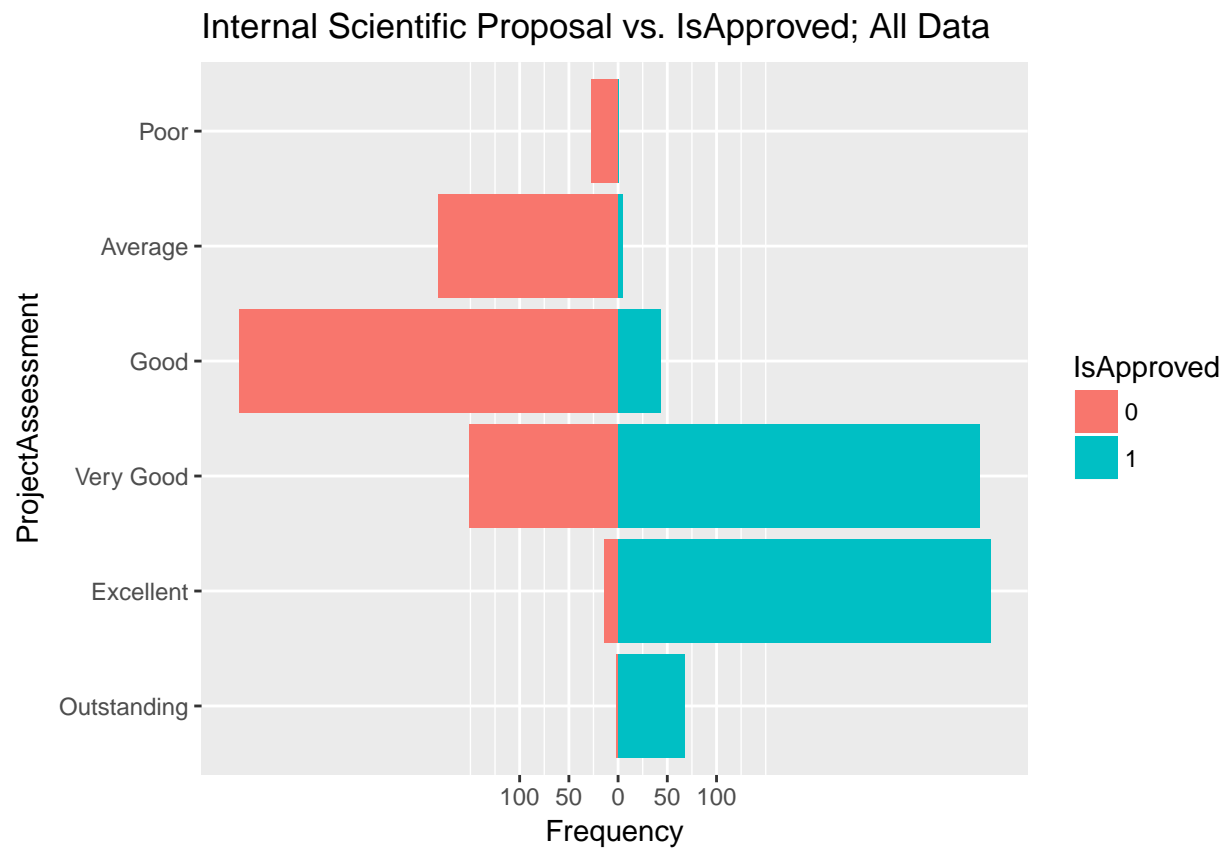
Internal Scientific Proposal vs. IsApproved, Div2
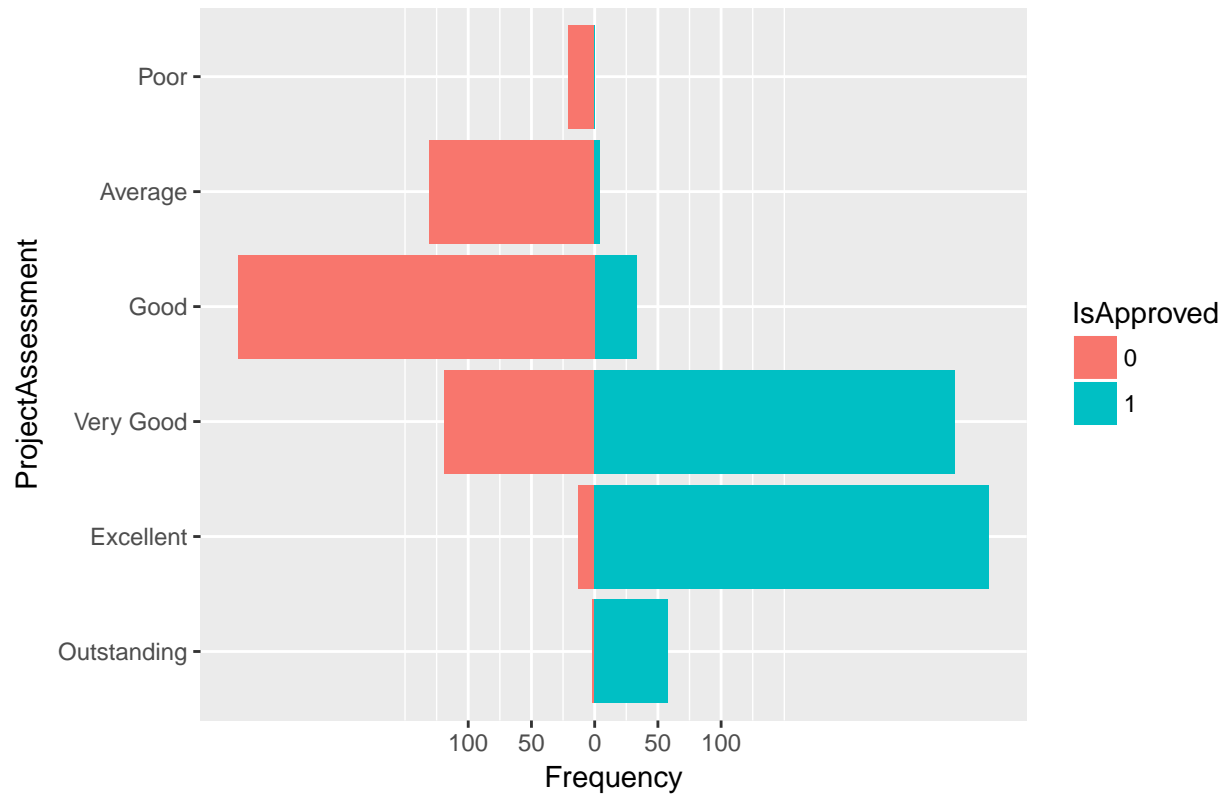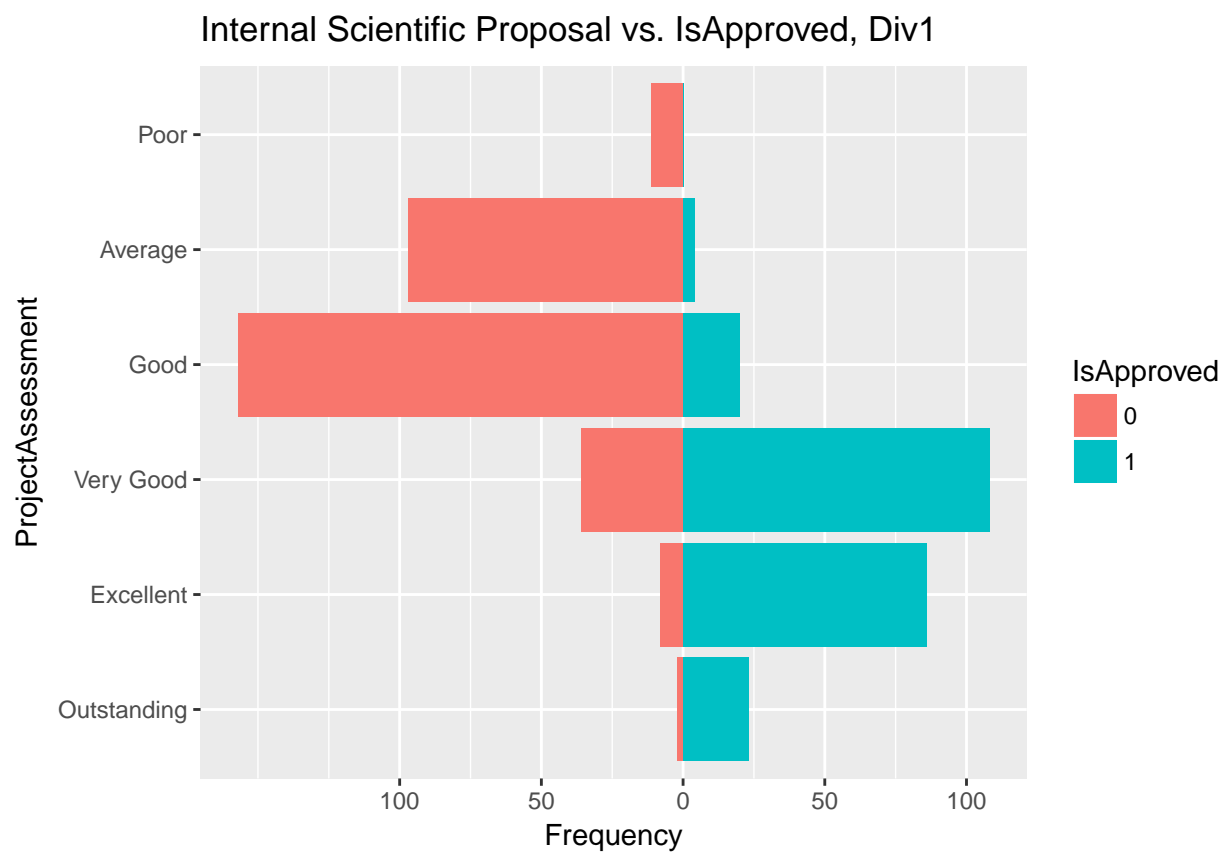
## Internal Scientific Proposal vs. IsApproved, Div3
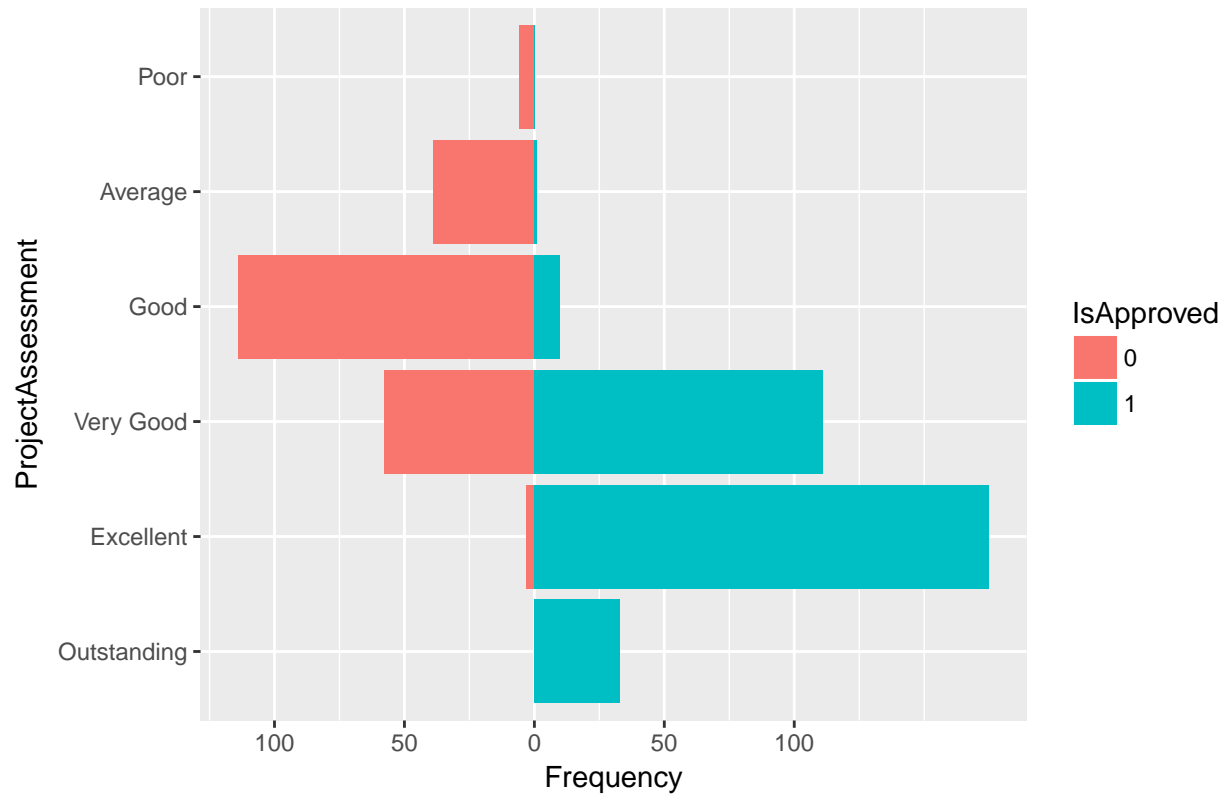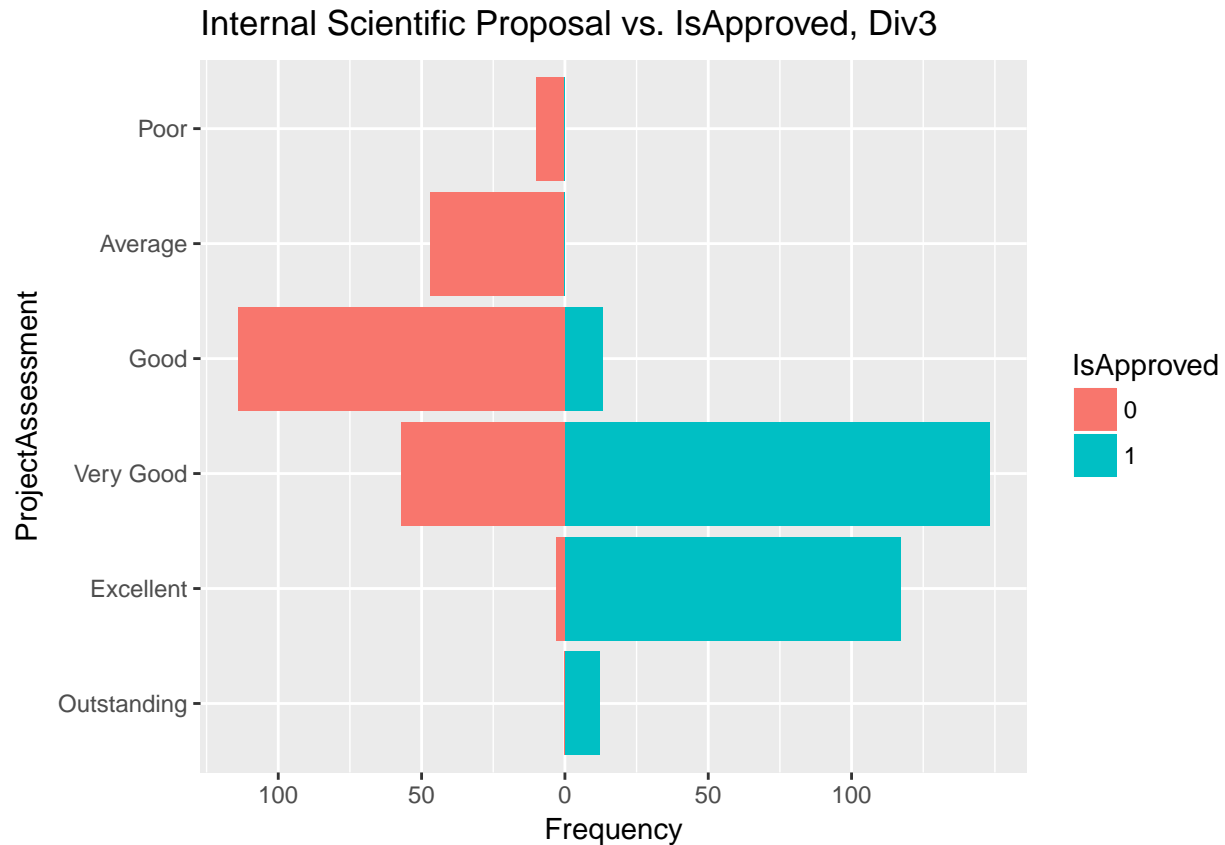


**Exploratory Analysis: measure agreement between stages of the process**

```
## Call: cohen.kappa1(x = x, w = w, n.obs = n.obs, alpha = alpha, levels = levels)
##
## Cohen Kappa and Weighted Kappa correlation coefficients and confidence boundaries
##                  lower estimate upper
## unweighted kappa  0.14     0.17  0.20
## weighted kappa    0.24     0.51  0.77
##
##  Number of subjects = 1623
```

We see almost no agreement between the external and internal ratings of an applicant, and of the proposal. We see this using Cohen's kappas, which measures how closely two different raters assessed the candidate, and accounts for random aggrement. TO CHECK: make sure that the percent of grades (outstanding) are similar amongst the internal and external reviewers for each step.

Alternative way of displaying the tables above to save space in report:

External Reviewers

#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected
Accepted

Rejected
Accepted

Rejected
Accepted

Rejected
Accepted

Rejected
Accepted

Overall Reviewer grade

poor

1

1

1

average

39

27

11
1

25
1

6

7

good

140

102
4

31
3

64
4

23

46

3

very good

641

308

166

119

48

161

73

123

57

143

84

excellent

626

120

378

30

98

55

128

61

190

34

158

   outstanding

176

10

144

3

19

6

35

6

83

1

45

   #Total cases

1623

568

692

194

169

311

241

220

330

231

290

#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected
Accepted

Rejected
Accepted

Rejected
Accepted

Rejected

Accepted

Rejected

Accepted

Main Applicant Track

poor

1

1

1

average

15

10

5

10

2

3

good

72

47

3

20

2

36

4

12

19

1

very good

463

240

94

86

43

141

55

73

32

112

50

excellent

710

227

338

68

77

105

127

107

143

83

145

   outstanding

362

44

257

14

47

18

55

26

155

14

94

   #Total cases

1623

568

692

194

169

311

241

220

330

231

290

#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected
Accepted

Rejected
Accepted

Rejected
Accepted

Rejected

Accepted

Rejected

Accepted

ScientificRelevance

  poor

2

1

1

2

  average

34

26

7

1

18

1

8

7

  good

108

81

6

19

2

53

4

16

31

4

very good

569

273

149

103

44

138

60

111

61

127

72

excellent

695

161

373

58

103

87

130

74

182

58

164

outstanding

215

26

164

6

19

13

46

11

87

8

50

#Total cases

1623

568

692

194

169

311

241

220
330

231
290
#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected
Accepted

Rejected

Accepted

Rejected

Accepted

Rejected

Accepted

Rejected

Accepted

Suitability

  poor

3

2

1

2

1

  average

67

47

19
1

39
1

9

18

good

222

144

28

39

11

83

20

39

3

61

16

very good

674

278

221

112

63

148

87

113

91

129

106

excellent

527

84

345

21

77

34

112

48

176

23

134

outstanding

130

13

98

2

17

5

21

10

60

34

#Total cases

1623

568

692

194

169

311

241

220

330

231

290

Internal Reviewers

 Result

 Rejected

 Accepted

 Overall Comparative Ranking

   D

15

   C

184

   BC

400

31

   B

149

395

   AB

12

363

   A

2

72

   #Total cases

762

861

#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected
Accepted

Rejected
Accepted

Rejected
Accepted

Rejected

Accepted

Rejected

Accepted

Overall Comparative Ranking

D

15

12

3

10

2

3

C

184

133

51

79

48

57

BC

431

295

23

105

8

169

21

111

7

120

3

  B

544

115

298

34

97

44

107

56

124

49

164

  AB

375

11

309

1

54

7
89

3
168

2
106
　A
74

2
62

10

2
24

31

17
　#Total cases
1623

568
692

194
169

311
241

220
330

231
290

#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected
Accepted

Rejected
Accepted

Rejected

Accepted

Rejected

Accepted

Rejected

Accepted

Main Applicant Track

poor

3

3

2

1

average

37

23

2

12

19

7

1

9

1

good

161

98
14

41
8

59
8

31
4

49
10
   very good
623

277
186

100
60

143
70

115
74

119
102
   excellent
611

143

355

35

78

74

125

55

168

49

140

outstanding

188

24

135

6

23

14

38

11

83

5

37

#Total cases

1623

568

692

194

169

311

241

220

330

231

290

#Total

Gender

Division

m

f

Div 1

Div 2

Div 3

Result

Result

Result

Result

Result

Rejected

Accepted

Rejected

Accepted

Rejected

Accepted

Rejected

Accepted

Rejected

Accepted

Project Assessment

poor

27

21

6

11

6

10

average

188

131

4

52

1

97

4

39

1

47

   good

428

282

33

103

10

157

20

114

10

114

13

   very good

518

119

285

32

82

36

108

58

111

57

148

excellent

392

13

312

1

66

8

86

3

175

3

117

outstanding

70

2

58

10

2

23

33

12

#Total cases

1623

568

692

194

169

311

241

220

330

231

290

Analysis

Results

Conclusion

Appendix

Detailed Data Description

Applications

- **AmountRequested**: Rounded to the next 10k CHF
- **AmountGranted**: Rounded to the next 10k CHF
- **IsApproved**: 1 if the application was approved, 0 if it was rejected
- **GradeFinal**: Comparative ranking of the application as determined by the evaluation body (the division of the National Research Council). A: "belongs to the 10% best percent"; AB: "10% are worse, 75% are better"; B: "50% are worse, 25% are better"; BC: " 25% are worse, 50% are better"; C"10% are worse, 75% are better"; D:"90% of the applications are better"

- **Division**: Evaluation Body in which the application was evaluated. Division 1 evaluates Social Sciences and Humanities; Division 2 Mathematics, Natural Sciences and Engineering; Division 3 Biology and Medicine

- **MainDiscipline**: as chosen by the applicant from the SNSF discipline list

- **MainDisciplineLevel2**: category in the SNF discipline list grouping disciplines into fields of research

- **CallTitle**: Call for proposals under which the application was submitted. Applications from the same Call are evaluated together, i.e. in competition to each other

- **CallEndDate**: Submission deadline of the Call

- **ResponsibleApplicantAcademicAgeAtSubmission**: Years since the applicant's PhD at time of submission; data only available since mid 2016

- **ResponsibleApplicantAgeAtSubmission**: Biological age of the applicant at time of submission; data only available since mid 2016

- **ResponsibleApplicantProfessorshipType**: employment situation of the applicant at time of submission; data only available since mid 2016

- **Gender**: of the main applicant

- **NationalityIsoCode**: Nationality of the main applicant

- **IsHasPreviousProjectRequested**: 0 if it is the applicant's first application at the SNSF, 1 if not

- **InstType**: Type of institution where the applicant is employed

- **IsContinuation**: 1 if the project is a thematic continuation of a previously approved project, 0 if not

- **ProjectID**: Anonymized identifier of the application

Referee Grades

- **Question**: Evaluation criterion
- **QuestionRating**: The (co-)referee's assessment of the evaluation criterion
- **OverallRanking**: The (co-)referee's overall comparative ranking of the application. A: "belongs to the 10% best percent"; same scale as the GradeFinal
- **RefereeRole**: Some applications have one referee evaluation, some have two. The role indicates who was the primary and who was the secondary referee (also called co-referee)
- **RefereeGender**
- **IDs**: Anonymized identifiers of the application, the referee and the evaluation by the referee

Reviews

- **Question**: Evaluation criterion
- **QuestionRating**: The external reviewer's assessment of the evaluation criterion
- **OverallGrade**: The external reviewer's overall assessment of the application
- **SourcePerson**: Who suggested the reviewer?
- **Gender**
- **Country**: where the reviewer is located. Not always known
- **EmailEnding**: ending of the reviewer's email address. Might be used as an approximation of the country where the reviewer is located in cases where this data is missing
- **IDs**: Anonymized identifiers of the application, the reviewer and the review