



Memorandum

Human Resources Division

TO: Todd Rent, Chief Examiner
Civil Service Commission

FROM: Human Resources Staff

RE: Establish a Passing Score for Grants Compliance Specialist

DATE: August 26, 2015

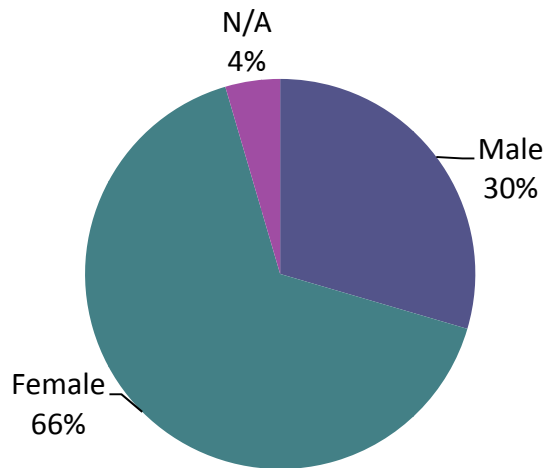
A. Summary

City of Urbana Human Resources staff recommends a passing score of 46% using the application as the exam. This would result in an eligibility register of 23 candidates (52% of the test group) with no adverse or disparate impact.

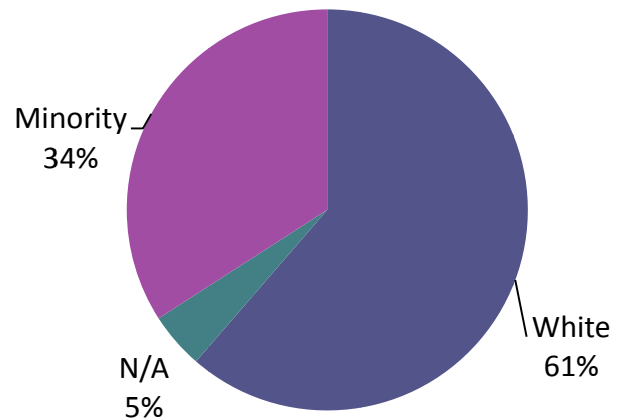
A. Background

The position was open for applications from July 23 – August 14, 2015; Human Resources received 44 applications for the position.

**Applicant Demographics
by Gender**



**Applicant Demographics
by Race**



Numerically, the breakdown of applicants is as follows:

Male	13	30%
Female	29	66%
No response or "n/a"	2	5%

Non-Minority	27	61%
Minority	15	34%
No response or "n/a"	2	5%

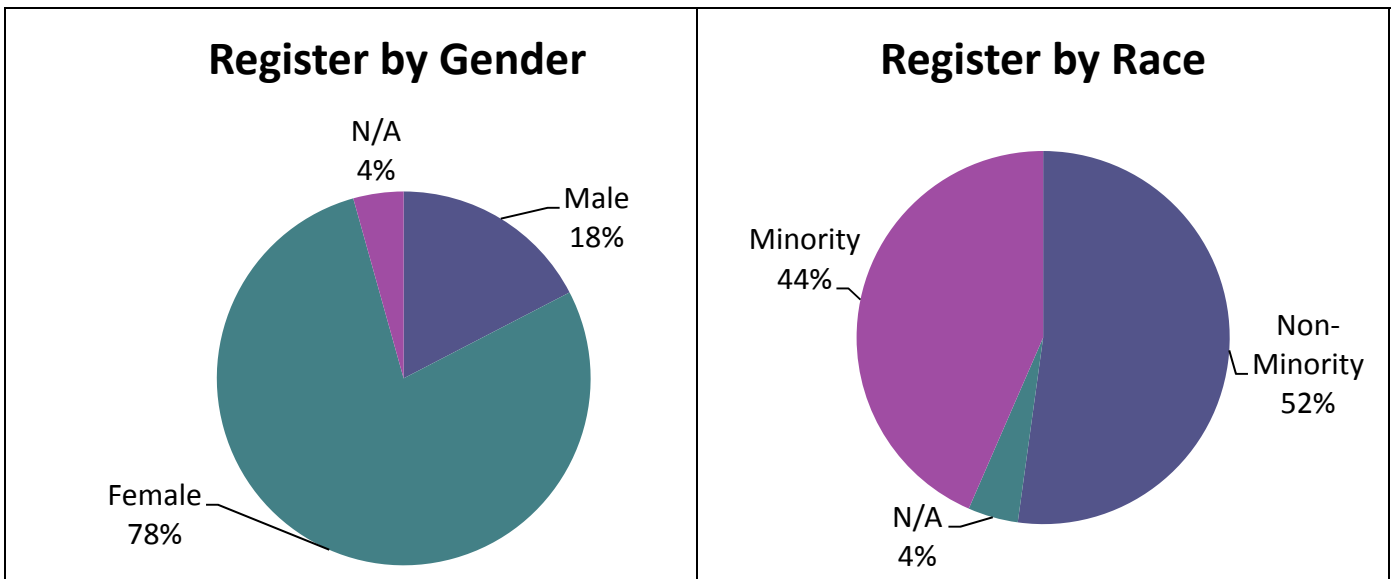
B. Application Screening

The application served as the Civil Service exam to evaluate the candidates. The scoring rubric can be found in Attachment A.

D. Passing Score

The hiring manager and HR staff jointly recommend a passing score of 46% to establish the register, which would allow 23 applicants to be placed on the eligibility register for future consideration. At this passing score, the data does not support a finding of disparate impact; a full report can be found in Attachment B.

46% Pass Rate				
	#	% of Total Tested	% of Like Group Tested	% of Register
Male	4	9% (4/44)	31% (4/13)	17% (4/23)
Female	18	41% (18/44)	62% (18/29)	78% (18/23)
No answer	1	2% (1/44)	50% (1/2)	8% (1/23)
	#	% of Total Tested	% of Like Group Tested	% of Register
Non-Minority	12	27% (12/44)	44% (12/27)	52% (12/23)
Minority	10	23% (10/44)	67% (10/15)	43% (10/23)
No answer	1	2% (1/44)	50% (1/2)	4% (1/23)



Attachment A: Application Scoring Rubric

1. Education

- a) H.S. diploma/G.E.D. or no degree = 0 pts.
- b) 1 year program/certificate = 1 pt.
- c) Fewer than 2 years of post-secondary education, no degree = 2 pts.
- d) Associate's degree = 3 points
- e) Bachelor's degree = 4 points
- f) Master's degree or higher = 5 points

2. Degree Type

- a) Accounting/Finance, Business Administration, Public Administration, or Urban Planning – 3 pts.
- b) A closely related field (e.g., Economics) = 2 pts.
- c) An unrelated field = 1 pt.
- d) No degree = 0 pts.

3. Experience

- a) No experience = 0 pts.
- b) Less than 1 year = 1 pt.
- c) 1-3 years = 2 pts.
- d) 3 - 5 years = 3 pts.
- e) 5 years or more = 4 pts.

4. Accounting Related Experience (1 pt. each for the following):

- a) Maintaining account ledgers
- b) Accounts Payable
- c) Accounts Receivable
- d) Account reconciliation
- e) Maintaining program records
- f) Preparing files and information to assist independent auditors conducting annual audits
- g) Assisting with preparation of various reports (financial or statistical) on a monthly, quarterly, or annual basis

5. Governmental Accounting and/or Auditing Experience

Yes = 3 pts., No = 0 pts.

6. Grants-Related Experience

- a) Experience with CDBG funding, HOME funding, and/or Supportive Housing Programs = 4 points, No = 0 points.

Disparate Impact Analysis

(an On-Line Internet based application)

Attachment B

Instructions: Please fill out the information into the form below. Once you have entered your data below, you may select the types of analysis to be conducted by checking the appropriate boxes. Then press the compute button at the bottom of the form to view the results.

Select the type of employment decision: <input type="text" value="Selection"/>			
Enter a title for your report: <input type="text" value="Grants Compliance Specialist 2015"/>			
Number of Male <input type="text" value="13"/> Applicants <input type="text" value="4"/> Selected	Number of Non-Minority <input type="text" value="27"/> Applicants <input type="text" value="12"/> Selected	Number of Younger <input type="text"/> Applicants <input type="text"/> Selected	Number of Non-Disabled <input type="text"/> Applicants <input type="text"/> Selected
Number of Female <input type="text" value="29"/> Applicants <input type="text" value="18"/> Selected	Number of Minority <input type="text" value="15"/> Applicants <input type="text" value="10"/> Selected	Number of Older <input type="text"/> Applicants <input type="text"/> Selected	Number of Disabled <input type="text"/> Applicants <input type="text"/> Selected
<input checked="" type="checkbox"/> -Adverse Impact <input checked="" type="checkbox"/> -Chi-Square <input checked="" type="checkbox"/> -Standard Deviation <input checked="" type="checkbox"/> -Confidence Intervals <input checked="" type="checkbox"/> Probability Distribution		Select the Statistical Tests you wish to execute by checking or unchecking the boxes on the left. Then press the 'Compute' button below.	
		<input type="button" value="Compute"/>	
Display: <input checked="" type="checkbox"/> Description of Statistic <input checked="" type="checkbox"/> Interpretation of Results			

Grants Compliance Specialist 2015

Adverse-Impact Report

Adverse Impact and the "four-fifths rule." - A selection rate for any race, sex, or ethnic group which is less than four-fifths (4/5ths) (or eighty percent) of the rate for the group with the highest rate will generally be regarded by the Federal enforcement agencies as evidence of adverse impact. [Uniform Guidelines on Employee Selection Procedures](#)

Rate of Females Applicants Selected	Rate of Males Applicants Selected	Adverse Impact Ratio for Females	Adverse Impact Ratio for Males
$(18/29) = 0.6207$	$(4/13) = 0.3077$	$(0.6207/0.3077) = 2.02$	$(0.3077/0.6207) = 0.5$
The Adverse Impact Ratio for Males is less than 0.80. Males Applicants are Selected at a rate less than 80% (4/5ths) of the rate that Females Applicants are Selected.			

Rate of Minorities Applicants Selected	Rate of Non-Minorities Applicants Selected	Adverse Impact Ratio for Minorities	Adverse Impact Ratio for Non-Minorities
$(10/15) = 0.6667$	$(12/27) = 0.4444$	$(0.6667/0.4444) = 1.5$	$(0.4444/0.6667) = 0.67$
The Adverse Impact Ratio for Non-Minorities is less than 0.80. Non-Minorities Applicants are Selected at a rate less than 80% (4/5ths) of the rate that Minorities Applicants are Selected.			

Chi-Square Report

Observed Expected	Selected	Not Selected	Row Totals
Males	4 6.8095	9 6.1905	13
Females	18 15.1905	11 13.8095	29
Column Total	22	20	42
Chi-Square = 3.5255 The value of the statistic is less than 3.841. This indicates that there is a 95 percent chance that these results have been obtained absent any form of bias. Therefore, you may conclude that these results fall within normal random variations and are not the result of bias.			

Observed Expected	Selected	Not Selected	Row Totals
Non-Minorities	12 14.1429	15 12.8571	27
Minorities	10 7.8571	5 7.1429	15

Column Total	22	20	42
Chi-Square = 1.9091			
The value of the statistic is less than 3.841. This indicates that there is a 95 percent chance that these results have been obtained absent any form of bias. Therefore, you may conclude that these results fall within normal random variations and are not the result of bias.			

Standard-Deviation Report

The difference between the proportion of the protected class Selected and the proportion of all Applicants Selected has a normal distribution with a mean and standard deviation. The statistic is shown below:

$$(r / n) - p$$

$$\text{sqrt}(p * (1-p) / n) * \text{sqrt}(1-q)$$

Analysis of proportion of Females Selected where:

- r = number of Females Selected.
- n = number of Selected (Females and Males).
- p = proportion of Applicants that are Females.
- q = proportion of Applicants Selected.

	Selected	Not Selected	Row Totals
Males	4	9	13
Females	18	11	29
Column Total	22	20	42

$$r = 18$$

$$n = 22$$

$$p = 29 / 42 = 0.69$$

$$q = (18 + 4) / (29 + 13) = 0.524$$

Standard Deviation Statistic = 1.878

These results show that the proportion of Females Selected is 1.878 standard deviations above the proportion of Applicants Selected. A result of less than 2 standard deviations is generally considered non-significant.

Analysis of proportion of Minorities Selected where:

- r = number of Minorities Selected.
- n = number of Selected (Minorities and Non-Minorities).
- p = proportion of Applicants that are Minorities.
- q = proportion of Applicants Selected.

	Selected	Not Selected	Row Totals
Non-Minorities	12	15	27
Minorities	10	5	15
Column Total	22	20	42

$$r = 10$$

$$n = 22$$

$$p = 15 / 42 = 0.357$$

$$q = (10 + 12) / (15 + 27) = 0.524$$

Standard Deviation Statistic = 1.382

These results show that the proportion of Minorities Selected is 1.382 standard deviations above the proportion of Applicants Selected. A result of less than 2 standard deviations is generally considered non-significant.

Confidence Interval Report

The proportion of the protected class Selected has an expected value that would fall within a specified confidence interval. The statistic is shown below:

$$\text{Observed value} = (r / n)$$

$$\text{Expected value} = p$$

$$\text{Standard Deviation} = \text{sqrt}(p * (1-p) / n) * \text{sqrt}(1-q)$$

Confidence Interval:

$$\text{Lower Bound} = p - 1.96 * \text{Std Dev}$$

$$\text{Upper Bound} = p + 1.96 * \text{Std Dev}$$

Analysis of proportion of Females Applicants Selected where:

- r = number of Females Selected.
- n = number of Applicants Selected.
- p = proportion of Females among those Selected.
- q = proportion of Applicants Selected.

$$r = 18$$

Disparate Impact analysis: a program by hr-software.net to analyze employment decisions for a variety of EE...

$n = 22$
 $p = (29/(29+13))=0.69$
 $q = ((18 + 4)/(29 + 13))=0.524$
 $(r/n)=18/22=0.8182$

The lower bound of the confidence interval is: $0.69 - (1.96 * 0.068) = 0.5572$
 The upper bound of the confidence interval is: $0.69 + (1.96 * 0.068) = 0.8238$

Confidence Interval = 0.5572 to 0.8238

These results show that the proportion of Females Females ($r/n=0.8182$) is contained in the confidence interval. Therefore a finding of disparate impact is not supported by this data.

Analysis of proportion of Minorities Applicants Selected where:

- r = number of Minorities Selected.
- n = number of Applicants Selected.
- p = proportion of Minorities among those Selected.
- q = proportion of Applicants Selected.

$r = 10$
 $n = 22$
 $p = (15/(15+27))=0.357$
 $q = ((10 + 12)/(15 + 27))=0.524$
 $(r/n)=10/22=0.4545$

The lower bound of the confidence interval is: $0.357 - (1.96 * 0.07) = 0.219$
 The upper bound of the confidence interval is: $0.357 + (1.96 * 0.07) = 0.4953$

Confidence Interval = 0.219 to 0.4953

These results show that the proportion of Minorities Minorities ($r/n=0.4545$) is contained in the confidence interval. Therefore a finding of disparate impact is not supported by this data.

Probability Distribution Report

Number Females Selected	Number Males Selected	Rate of Females Applicants Selected	Rate of Males Applicants Selected	Adverse Impact Ratio of Females	Adverse Impact against Females ?	Probability	Cumulative Probability
9	13	(9/29)	(13/13)	0.3103	YES	0.000019	0.000019
10	12	(10/29)	(12/13)	0.3736	YES	0.000507	0.000526
11	11	(11/29)	(11/13)	0.4483	YES	0.005252	0.005779
12	10	(12/29)	(10/13)	0.5379	YES	0.028888	0.034666
13	9	(13/29)	(9/13)	0.6475	YES	0.09444	0.129107
14	8	(14/29)	(8/13)	0.7845	YES	0.194277	0.323384
15	7	(15/29)	(7/13)	0.9606	NO	0.259037	0.582421
16	6	(16/29)	(6/13)	1.1954	NO	0.226657	0.809078
17	5	(17/29)	(5/13)	1.5241	NO	0.129994	0.939072
Selected-> 18	4	(18/29)	(4/13)	2.0172	NO	0.048146	0.987218
19	3	(19/29)	(3/13)	2.8391	NO	0.01115	0.998368
20	2	(20/29)	(2/13)	4.4828	NO	0.00152	0.999888
21	1	(21/29)	(1/13)	9.4138	NO	0.000109	0.999997
22	0	(22/29)	(0/13)		NO	0.000003	1

Given that 22 were Selected from a pool of 13 Males and 29 Females it was possible to have Selected from 9 to 22 Females.

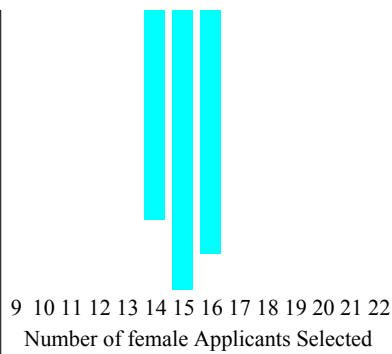
Adverse Impact would be found if you Selected 14 or fewer Females.

The probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is 0.3234 (the sum of the probabilities of having Selected 14 or fewer Females).

Since the probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is greater than 10%, an observed Adverse Impact may be not significant since the probability is greater than 1 in 10 that Adverse Impact would have occurred due to chance.

Probability Distribution of the variable: Number of Females Selected.



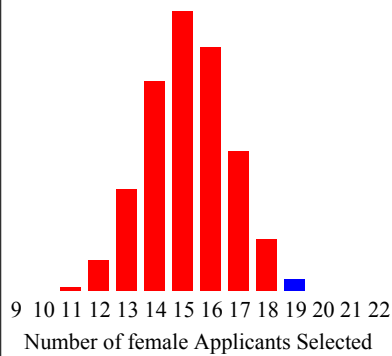


The probability distribution of having Selected from 9 to 22 Females is displayed above. The graph above is shown starting with 9 since the probabilities below this point are near zero. As can be seen, the most likely event (highest probability) to have occurred by chance (or decisions not affected by any form of bias) is to have Selected 15 female Applicants. This represents the mean of the probability distribution. Approximately half of the probability distribution is above this point and approximately half is below this point. The total area contained in the probability distribution is equal to 1. Thus, probabilities for each number of female Applicants Selected are a fraction of the total probability distribution. The larger areas of the distribution represent higher probabilities of occurrence. Adding the individual probabilities up to a certain point enable you to compute the probability of having Selected that many or fewer female Applicants. Adding the individual probabilities from a certain point and higher enable you to compute the probability of having Selected that many or more female Applicants.

The characteristics of the probability distribution--its mean and standard deviation--are a function of the number of female and male Applicants and the number of Applicants to be Selected. Though it is possible to have Selected from 9 to 22 female Applicants, the individual probabilities of having Selected each number of female Applicants can be computed and accumulated. As noted before, these individual probabilities are a function of the number of female and male Applicants and the number of Applicants to be Selected.

Using the distribution above, a 90 percent confidence interval on the variable 'Number of Females Selected' would have a lower bound of 13 and an upper bound of 18.

The significance of having Selected 18 or fewer Females is graphically displayed below.



As noted earlier, Adverse Impact, according to the 4/5ths rule, would be found if you Selected 14 or fewer female Applicants.

You have Selected 18 female Applicants. The probability of having Selected 18 or fewer Females is equal to the cumulative probability for having Selected 18 Females Applicants. The cumulative probability of having Selected 18 female Applicants is 0.9872 and is graphically displayed, in red, above.

Since the probability is greater than 10%, we are unable to reject the hypothesis that the decisions occurred due to chance. Therefore, we must conclude that it is entirely possible that having Selected 18 or fewer female Applicants is an event that occurred due to chance and not from discriminatory actions by the employer.

Number Minorities Selected	Number Non-Minorities Selected	Rate of Minorities Applicants Selected	Rate of Non-Minorities Applicants Selected	Adverse Impact Ratio of Minorities	Adverse Impact against Minorities ?	Probability	Cumulative Probability
0	22	(0/15)	(22/27)	0	YES	0	0
1	21	(1/15)	(21/27)	0.0857	YES	0.000009	0.000009
2	20	(2/15)	(20/27)	0.18	YES	0.000181	0.00019
3	19	(3/15)	(19/27)	0.2842	YES	0.001966	0.002156
4	18	(4/15)	(18/27)	0.4	YES	0.012452	0.014608
5	17	(5/15)	(17/27)	0.5294	YES	0.049308	0.063916
6	16	(6/15)	(16/27)	0.675	YES	0.127006	0.190922
7	15	(7/15)	(15/27)	0.84	NO	0.217725	0.408647
8	14	(8/15)	(14/27)	1.0286	NO	0.251221	0.659868
9	13	(9/15)	(13/27)	1.2462	NO	0.195394	0.855262
Selected-> 10	12	(10/15)	(12/27)	1.5	NO	0.101605	0.956867
11	11	(11/15)	(11/27)	1.8	NO	0.034638	0.991505
12	10	(12/15)	(10/27)	2.16	NO	0.007471	0.998976

13	9	(13/15)	(9/27)	2.6	NO	0.000958	0.999933
14	8	(14/15)	(8/27)	3.15	NO	0.000065	0.999998
15	7	(15/15)	(7/27)	3.8571	NO	0.000002	1

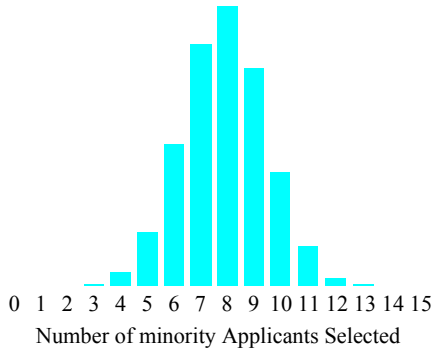
Given that 22 were Selected from a pool of 27 Non-Minorities and 15 Minorities it was possible to have Selected from 0 to 15 Minorities.

Adverse Impact would be found if you Selected 6 or fewer Minorities.

The probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is 0.1909 (the sum of the probabilities of having Selected 6 or fewer Minorities).

Since the probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is greater than 10%, an observed Adverse Impact may be not significant since the probability is greater than 1 in 10 that Adverse Impact would have occurred due to chance.

Probability Distribution of the variable: Number of Minorities Selected.

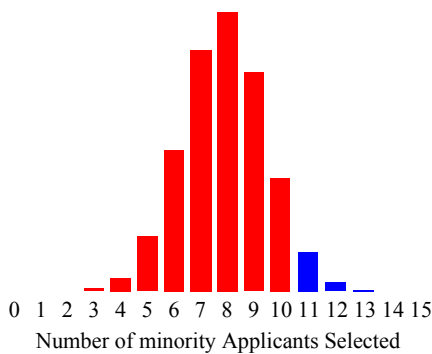


The probability distribution of having Selected from 0 to 15 Minorities is displayed above. As can be seen, the most likely event (highest probability) to have occurred by chance (or decisions not affected by any form of bias) is to have Selected 8 minority Applicants. This represents the mean of the probability distribution. Approximately half of the probability distribution is above this point and approximately half is below this point. The total area contained in the probability distribution is equal to 1. Thus, probabilities for each number of minority Applicants Selected are a fraction of the total probability distribution. The larger areas of the distribution represent higher probabilities of occurrence. Adding the individual probabilities up to a certain point enable you to compute the probability of having Selected that many or fewer minority Applicants. Adding the individual probabilities from a certain point and higher enable you to compute the probability of having Selected that many or more minority Applicants.

The characteristics of the probability distribution--its mean and standard deviation--are a function of the number of minority and non-minority Applicants and the number of Applicants to be Selected. Though it is possible to have Selected from 0 to 15 minority Applicants, the individual probabilities of having Selected each number of minority Applicants can be computed and accumulated. As noted before, these individual probabilities are a function of the number of minority and non-minority Applicants and the number of Applicants to be Selected.

Using the distribution above, a 90 percent confidence interval on the variable 'Number of Minorities Selected' would have a lower bound of 5 and an upper bound of 10.

The significance of having Selected 10 or fewer Minorities is graphically displayed below.



As noted earlier, Adverse Impact, according to the 4/5ths rule, would be found if you Selected 6 or fewer minority Applicants.

You have Selected 10 minority Applicants. The probability of having Selected 10 or fewer Minorities is equal to the cumulative probability for having Selected 10 Minorities Applicants. The cumulative probability of having Selected 10 minority Applicants is 0.9569 and is graphically displayed, in red, above.

Since the probability is greater than 10%, we are unable to reject the hypothesis that the decisions occurred due to chance. Therefore, we must conclude that it is entirely possible that having Selected 10 or fewer minority Applicants is an event that occurred due to chance and not from discriminatory actions by the employer.

[View Source Code](#)

Source: <http://www.hr-software.net/EmploymentStatistics/DisparateImpact.htm>