

Explanation of Formula to Compare Women to Men in Olympic Weightlifting = 1.6335

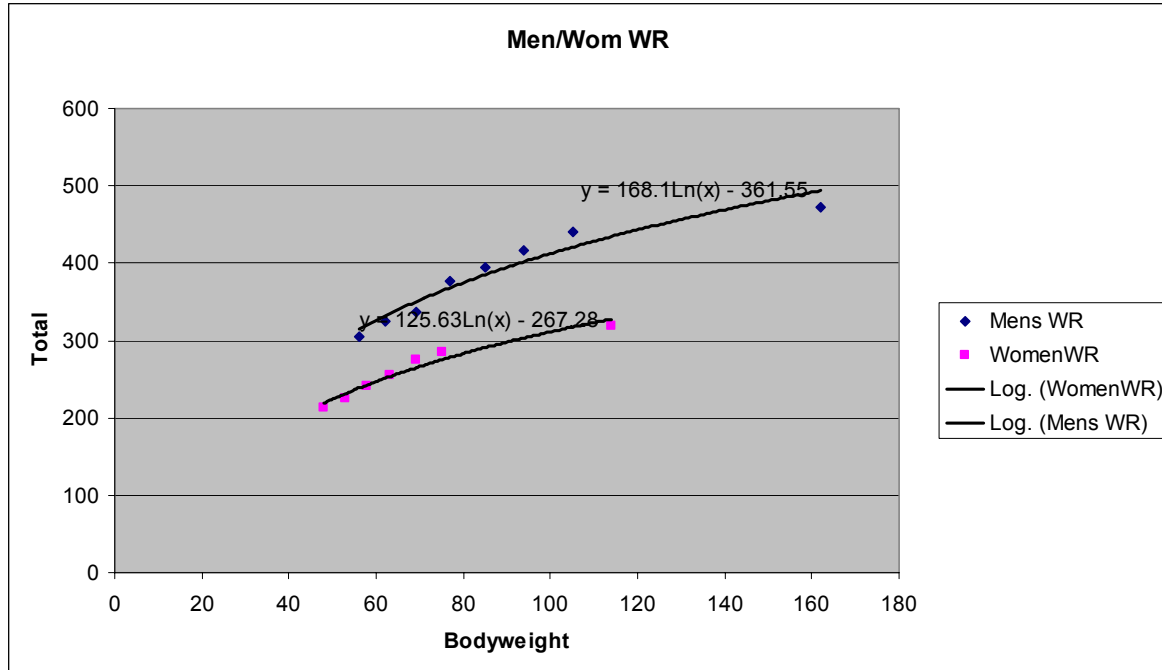
- 1.) The question to ask is “How much more do men lift than women?” We should consider men and women of equal bodyweights. So more specifically, “how much more does a man lift than a woman of equal bodyweight?”

In Olympic weightlifting, we have two standards to examine to solve the “equation—
“The current world records and the womens’/mens’ Sinclair Coefficients.

Below are the current world records and the corresponding Sinclair Coefficient:

Men's Weight Classes	World Record	Sinclair Coefficient
56	305	1.558522
62	325	1.441035
69	337	1.338021
77	377	1.250897
85	395	1.186209
94	417	1.132098
105	440	1.084721
105+	472	1.0005
Women's Weight Classes	Women's World Records	Sinclair Coefficient
48	213	1.454305
53	225	1.334353
58	241	1.24593
63	256	1.179583
69	275	1.12074
75	286	1.078312
114	318	

- 2.) Below is a simple plot of the above data. It shows how men/women’s world records increase as bodyweight increases. $(x,y) = (\text{bodyweight}, \text{world record})$ for the corresponding men/woman curve.



- 3.) Both curves are similar and can be easily explained by Logarithmic equations. The equations that fit are listed on the graph. The r-squared values for the equations are close to 85%--which is pretty high for “real-life” data.
- 4.) Now that we have these equations, we will use the law of proportions to figure out how much more men lift than women at several different weights. We can examine this data in two ways. First, we can convert the women’s totals into proportional totals using men’s weight classes. Then, we can do the same thing with men’s totals using women’s weight classes. Remember, this well fit curve allows us to do this—all we have to do is plug the weight class we want to examine into the formula. Then, once the totals are standardized to compare across equal bodyweights, we can determine how much more men lift than women.

When we use the men’s weight classes to find plots on the women’s curve, this is what we see: Similarly, we can use the women’s weight classes to find points on the men’s curve.

Men's Weight Class	WOM(Men)		Men(WOM)
56	238.42	48	289.2
62	251.21	53	305.86
69	264.65	58	321
77	278.43	63	334.9
85	290.85	69	350.2
94	303.49	75	364.21
105	317.39		

- 5.) So now we can answer this question—“How much more do men lift at equal weights than women?” For example—in the 56kg class, we can now divide the actual men’s world record by the point on the woman’s curve corresponding to 56 kg. –which is $305/238.42 = 1.279$

This table shows what happens when we do this across all of the men’s weight classes

WC	WOM WR(Men WC)	MEN/WOM(MEN)
56	238.42	1.279255096
62	251.21	1.293738307
69	264.65	1.273379936
77	278.43	1.354020759
85	290.85	1.358088362
94	303.49	1.374015618
105	317.39	1.386307067

If we average all of the values of Men’s world records divided by (women’s world records of men’s weight classes), we get

1.35

Amazingly enough, if we go through the same process on the men’s curve for women’s weight classes, we get the same thing: 1.35.

Now for the last part--In weightlifting, we use the Sinclair formula to convert totals across weight classes into a super heavy weight total. Therefore, it is appropriate to examine the difference in men’s and women’s Sinclair Coefficients. As we did with the totals, we must standardize this comparison to examine the coefficients for like weight classes. In other words, we can’t just compare a 48kg woman with a 56kg man. We must compare a 48kg woman with a 48 kg man and all the way up.

This table uses women’s weight classes to compare the corresponding men’s and women’s Sinclair coefficients:

	WOMSC	men sc	msc/wsc
48	1.454305	1.780562	1.224339
53	1.334353	1.631186	1.222455
58	1.24593	1.515669	1.216496
63	1.179583	1.424375	1.207524
69	1.12074	1.338021	1.193873
75	1.078312	1.270242	1.177991

We can now average the coefficients of msc/wsc. This average is 1.21.

OK—WE'RE FINALLY THERE! Now, we simply multiply the average difference in Sinclair Coefficients by the average difference in world records

$$= 1.35 * 1.21 = 1.6335.$$

1.6335 is a mathematically sound and accurately calculated AVERAGE