

Busting the shower-grower myth: Uncertainty regarding erect penis length given a known flaccid size is overstated

www.cocksizetest.com

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Abstract

User-submitted penis size data from www.cocksizetest.com are examined to provide means, distributions and statistical analyses. We report a mean erect length of 15.1 cm, a mean erect girth of 13.3 cm, and a mean flaccid length of 10.7 cm. A linear regression model of erect length vs flaccid length is presented with adjusted $r^2 = 0.7$. This model can be used to estimate erect length given flaccid length, providing a prediction that is correct within 2 cm 3 times out of 4. We discuss potential sources of bias and limitations, give recommendations for further study and conclude by rejecting the standard narrative that erect penis size cannot be estimated given flaccid penis size.

Introduction

The subject of flaccid and erect penis size is a matter of perennial interest. Flaccid penis size influences male attractiveness,¹ and over the course of a man's life, 45% of men want to have a larger penis.²

The relationship between flaccid and erect penis size remains shrouded in mystery, with multiple competing and sometimes contradictory narratives. Master's and Johnson reported that "the difference in average erectile size increase between the smaller flaccid penis and the larger flaccid penis is not significant."³ An analysis of the Kinsey data reported that there is an inverse relationship between the length of the flaccid penis and its increase in size during erection.⁴ It is a common belief that flaccid penis length is not predictive of erect penis length, with larger flaccid penises colloquially referred to as "showers" and smaller flaccid penises popularly referred to as "growers." It is taken by many to be the case that flaccid penis length is so much more variable than erect penis length that inferring the latter from the former is impossible.

Here we provide a follow-up to our previously reported estimate for average penis size⁵ based on a larger sample size and incorporate new data regarding flaccid measurements. This report does not aim to settle the question of what the "true" average penis size is. For a number of practical reasons, this number is very likely to remain unknowable. However, the numbers represented by this report are an excellent representation of penis sizes among men who have an interest in comparing them.

We will also consider the relationship between flaccid and erect penis sizes, and discuss whether an attitude of general skepticism regarding erect penis size is warranted when flaccid size is known.

Methods

These data were collected from users of www.cocksizetest.com. Only photo-verified and human-curated measurements were included in this analysis. Measurements that reflect self-report only, without photo verification were excluded. Some analyses represent only the subset of users who provided flaccid measurement photos.

For erect length, users are instructed to measure the shortest path along the top of their erect cock, from the base to the tip. For girth, users are instructed to choose a cross-section that is neither the thickest nor the thinnest, but most representative of their girth as a whole. Measurement photos are carefully curated by

moderators, and due to the competitive nature of the context of data collection, photo-verification is also carefully scrutinized by the other members of the site.

For flaccid length, users are instructed to measure what they consider to be the “typical size presented at a urinal, public shower or locker room.” This standard was chosen for practical reasons. There are many lengths that a person’s flaccid penis can take, depending on temperature, level of arousal and many other factors. While maximal erect length is fairly straightforward, comparing it to minimal flaccid length is not. (E.g. Should a user be required to bathe their penis in ice beforehand? How long should a user be required to think non-arousing thoughts before measurement?) Rather than trying to measure the “true” flaccid size, users were instructed to measure the size that we take to be most relevant—what others will see in the most common contexts of comparison. For simplicity, only flaccid length, and not girth was measured.

All data points included in this report represent photo-verified and human-curated measurements.

All statistical tests and graphs were done with *R* version 3.4.1⁶ using the *ggplot2* package.⁷ For statistical testing, we defined $p < 0.05$ to be statistically significant. We did not correct for statistical multiplicity and our linear model represents an exploratory analysis.

Results

Sample demographics

Between 2011-09-10 and 2017-07-22, 26,774 users signed up for an account on www.cksizecontest.com. Of these, 1603 verified their claimed size with measured length and girth photos. A total of 84 users submitted photos measuring their length while flaccid.

Distribution of length and girth

The mean for erect penis length among photo-verified users of www.cksizecontest.com is 15.1 cm, with standard deviation 2.5 cm. The mean for erect penis girth is 13.3 cm, standard deviation 1.4 cm. The sample size for erect penis length and girth measurements was $n = 1603$.

The mean for flaccid penis length is 10.7 cm, standard deviation 2.8 cm. The sample size for flaccid penis length and girth measurements was $n = 84$.

To visually represent the distribution of sizes in our sample, we graphed density plots for flaccid measured length and erect measured length among participants in our sample (see blue and red density plots in Figure 1, respectively). Similarly, a density plot of girths of participants was graphed (see green density plot in Figure 2).

Flaccid length vs erect length

To investigate the relationship between flaccid and erect lengths, we graphed a density plot of the difference between a user’s erect and flaccid measured lengths (Figure 3, left). The mean difference is 4.6 cm and the standard deviation among those differences is 1.7 cm. We also graphed a density plot of the ratio of erect to flaccid length (Figure 3, right). The mean ratio of erect to flaccid length is 1.5 with standard deviation 0.3.

To test the hypothesis that penises with smaller flaccid sizes grow more when erect, we calculated a linear regression model of the difference between erect and flaccid length as a function of flaccid length. The slope of the linear model is slightly negative but significantly different from 0 ($p < 0.05$). The adjusted r^2 for this model is 0.05.

To test the hypothesis that erect length can be predicted from flaccid length, we calculated a linear regression model of erect length as a function of flaccid length. Using this model, erect length (l_e cm) can be estimated

from flaccid length (l_f cm) by the following formula: $l_e = 0.85l_f + 6.2$, with adjusted $r^2 = 0.7$. Both the intercept and the slope are statistically significant with $p < 0.001$. See Figure 5 for a scatter plot of erect and flaccid lengths. The blue line represents the estimate from the linear model given above, where the grey shaded area illustrates the 95% confidence interval for the slope of the model. The dashed grey line indicates parity between erect and flaccid lengths (as long as all erect size is equal to or greater than flaccid size, this is the lowest a point can possibly appear on this plot).

In order to evaluate the formula given above as a predictive model, we plotted a histogram of the absolute differences between measured length and expected length, given our sample and the predictive model above (see Figure 6, left). An estimate of erect length based on flaccid length and the formula above would be accurate within 3 cm 96% of the time and accurate within 2 cm 77% of the time (see Figure 6, left). For reference, guessing that every person in our sample of users with submitted flaccid measurement photos has the average erect length in our sample, 15.1 cm, would be correct within 3 cm 70% of the time and accurate within 2 cm 52% of the time (see Figure 6, right).

In rare cases, there are users whose range of lengths from flaccid to erect do not overlap. That is to say, some users are longer flaccid than others are while erect. We plotted the proportion of the sample with a longer flaccid length than the erect length in question as a function of erect length (Figure 7, left). We also plotted the proportion of the sample with a longer erect length than the flaccid length in question as a function of flaccid length (Figure 7, right).

Discussion

We previously reported a mean erect penis length of 15.3 cm and a mean erect penis girth of 13.3 cm, ($n = 772$).⁵ Our updated figures for erect length and girth, 15.1 cm and 13.3 cm, respectively, reflect a greater sample size ($n = 1603$).

This is in comparison to an average length of 15.8 cm, standard deviation 1.96 cm, for and an average girth of 12.3 cm, standard deviation 1.8 cm from the Kinsey study ($n = 2770$ and $n = 2628$, respectively).⁴ A more recent systematic review of 15,521 subjects by Veale et al. reports mean length 13.12 cm, standard deviation 1.66 cm and mean girth 11.66 cm, standard deviation 1.10 cm.⁸

Our data were collected in the context of a literal internet cock size contest, and so they do not, of course, constitute a random sample. A truly random sample would be nearly impossible to obtain, as a review of the literature on the subject demonstrates.

The Kinsey study, for example, relied on non-photo-verified self-report, which may reflect an optimistic measurement and self-selection bias, resulting in a higher average size.⁴ In contrast, it is very common for subjects to be recruited from among urological or sexual dysfunction patients, which may represent a sample that includes a higher proportion of patients with penis ailments, biasing their reported average downward.⁹⁻¹⁶ Veale et al. combined the results of the measurements of 15,521 men,⁸ which included the studies cited above that recruited from urological and sexual dysfunction clinics, and they admit that none of the studies they considered gave any details on how they recruited their samples or how many refused to participate. Further, many measurements were collected by a 3rd party in a clinical environment, which will bias the sample against subjects who are unable to perform sexually under such conditions.

The competitive nature of our sampling strategy does not mean that the sample collected is necessarily going to be unrepresentatively biased toward larger individuals. Different users join www.cocksizetest.com with different motivations, and it is incorrect to assume that all join out of a competitive desire to win. In fact, many join out of a fetishized desire to lose. Some users join out of curiosity with regard to their own standing, or simply from a desire to gain access to other users' photos, without regard for their standing in the competition. Some users have expressed that their motivation to join was to participate in the statistical aggregation that this report represents, along with its previous versions.

Even among users who join out of a desire to win such a competition, there is likely to be a wide range of sizes represented. Many users join without accurate prior knowledge of their own measurements, due to an

optimistic (or pessimistic) self-assessment, or having never measured before, or not measuring accurately until forced to do so by the photo-verification process. It is also very common for a user to join without a good estimate of their ranking among other penis sizes, and finding to their surprise that they are not, relatively to others, as big as they thought.

The range of sizes depicted in Figures 1 and 2 seem to indicate a wide range represented. These all provide reason to question whether the non-random nature of the sample will be necessarily biased toward larger sizes. Certainly, the medical literature's extensive dependence on urological or sexual dysfunction patients casts doubt on their published estimates. Penis size is of nearly universal interest and so it is at least conceivable that, despite the non-random sampling, it still constitutes a sample that is representative of human penises generally.

But let us accept for the sake of argument the premise that there is a set of people that this sampling method would systematically exclude, biasing this report toward larger endowed individuals. This would be a problem if one's only goal was to make an estimate of the "true" average penis size (i.e. among all people who have penises). However, if your goal is to know how well one would do among those who have the inclination to measure and compare, this sample provides an excellent estimate. In fact, if it is the case that there is a set of less-endowed people who are systemically disinclined to comparing, then it is useful to have an estimate of average penis size that does exclude them, as the pool of people one is likely to compare oneself with would not, of course, include them.

Regardless of whether the results published here represent a systemic bias toward larger-endowed individuals, it is more difficult to make the case that there is a systemic bias against people with smaller flaccid penis length and proportionately larger erect penis length.

Users were instructed to measure their flaccid length at the level of arousal they would typically present at a urinal or locker room, in order to best capture the conditions under which another person would see their flaccid length and attempt an estimate of erect length. This adds some subjectivity to the concept of "flaccid length." Unfortunately, any method for measuring flaccid length will have built into it similar problems. Flaccid size changes with temperature and level of arousal, and even something as objective-sounding as one's "smallest" penis size would be difficult to confirm using any method.

Flaccid vs erect length

The variation among flaccid length measurements is similar to the variation observed among erect length measurements, with standard deviations of 2.8 cm and 2.5 cm respectively. This 0.3 cm change in standard deviation stands in contrast to the common belief that flaccid penis measurements represent a much greater level of variation that is equalized by erect sizes. That is to say, the variety in flaccid sizes one sees in the locker room is not much greater than the variety of sizes one would see in a bedroom.

The average amount of growth from flaccid to erect length is 4.6 cm, corresponding to an average erect length that is 1.5 times the flaccid length. There are a small number of potential outliers, suggesting that cases in which there is a large amount of growth from flaccid to erect length are rare.

The linear regression model of growth as a function of flaccid length (Figure 4) indicates that there is a general trend toward less growth as flaccid sizes increase. This effect should not be overstated though. An r^2 of 0.05 indicates that flaccid length is an extremely poor predictor of the amount of growth from flaccid to erect, and the difference that this represents from one end of the spectrum of sizes to the other is very modest.

Stretched penile length has been suggested in other publications as a good estimator of erect penis length.^{8,17} We also reported a linear regression model of erect length as a function of flaccid length (Figure 5). Erect and flaccid length are well correlated, with $r^2 = 0.7$. Using this model to predict erect sizes given a flaccid size will be correct within 2 cm 3 times out of 4. For reference, simply guessing that every person has average length will be correct within 2 cm a little more than half the time.

It is a limitation of this predictive model that it depends on knowledge of the flaccid length of the individual being estimated. In a real-life context, this size is an estimate as well, and so this limits the usefulness of the model. However, an inability to observe an exact value for an individual's flaccid length does not undermine the point that the shower-grower distinction has been much overstated, possibly in an attempt to allow those who are exposed as lesser-endowed while flaccid the dignity of doubt with regard to their erect length.

The graphs in Figure 7 can be interpreted as an estimate of the chance that one will encounter a penis whose range of sizes from erect to flaccid does not overlap with one that is the size in question, from the perspective of the smaller (left) or the larger (right) individual. In either case, for a person with an average flaccid length (10.7 cm) or an average erect length (15.3 cm), the proportion of others with non-overlapping length ranges are both approximately 5%.

Future investigation

Due to sample size limitations, we did not randomly split our sample into a “training” and “confirmation” set in order to confirm our predictive model. A follow-up study would re-evaluate the predictive model under these conditions, and with a larger data set.

While the predictive model here is of interest, future investigation may examine erect length as a function of a number of other variables stereotypically associated with penis size, such as ethnicity,¹⁸ sexual orientation,¹⁹ height,⁴ foot size,²⁰ digit ratio,¹¹ number of sexual partners, etc.

Conclusion

Taken together, general skepticism regarding erect penis size given known flaccid size is unwarranted, as 3 times out of 4, erect sizes fall within 2 cm of the prediction of a simple linear model. There is only slightly more variation among flaccid lengths than erect ones, and smaller flaccid lengths only grow marginally more than larger ones. These data suggest that in most cases, if a person is bigger in the locker room or urinals, they will also be bigger in the bedroom.

Figures

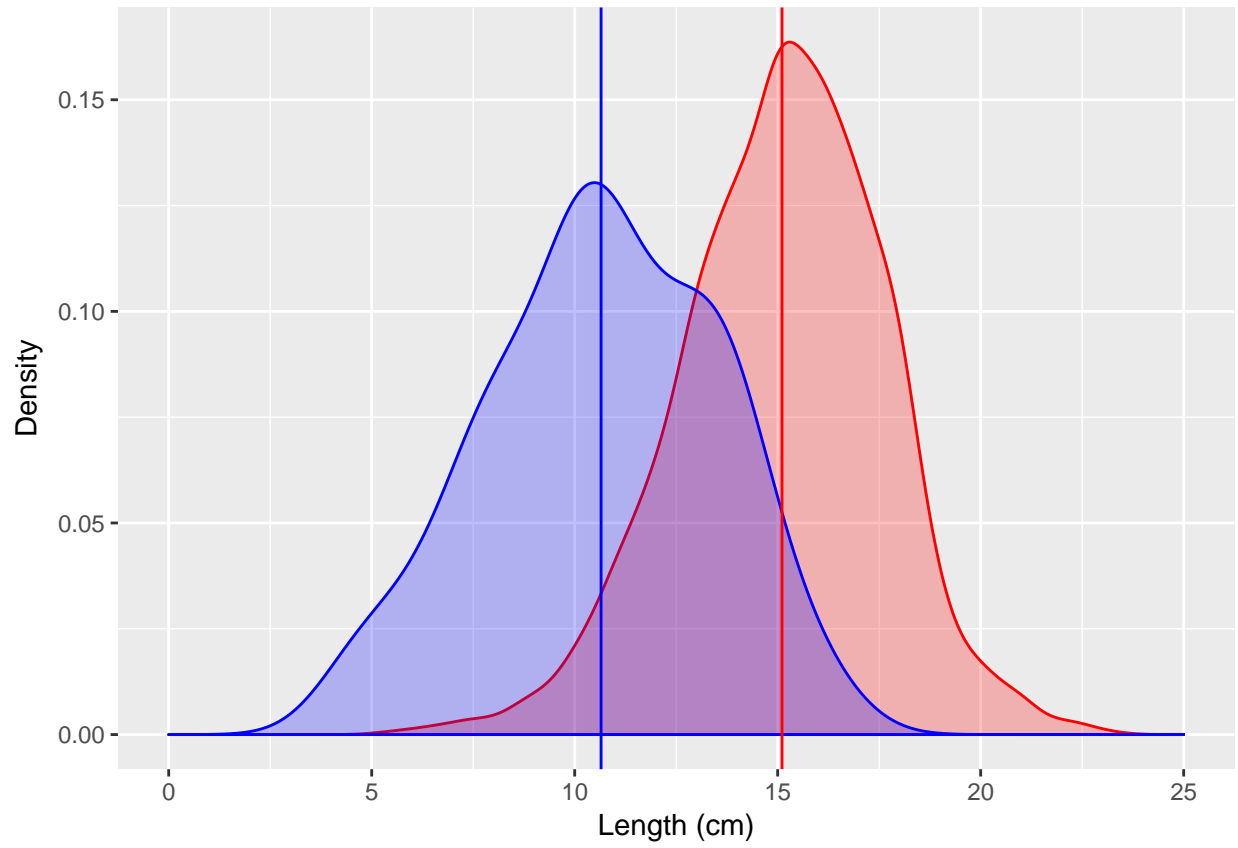


Figure 1: Distributions of flaccid (blue) and erect (red) lengths. Vertical lines indicate mean values.

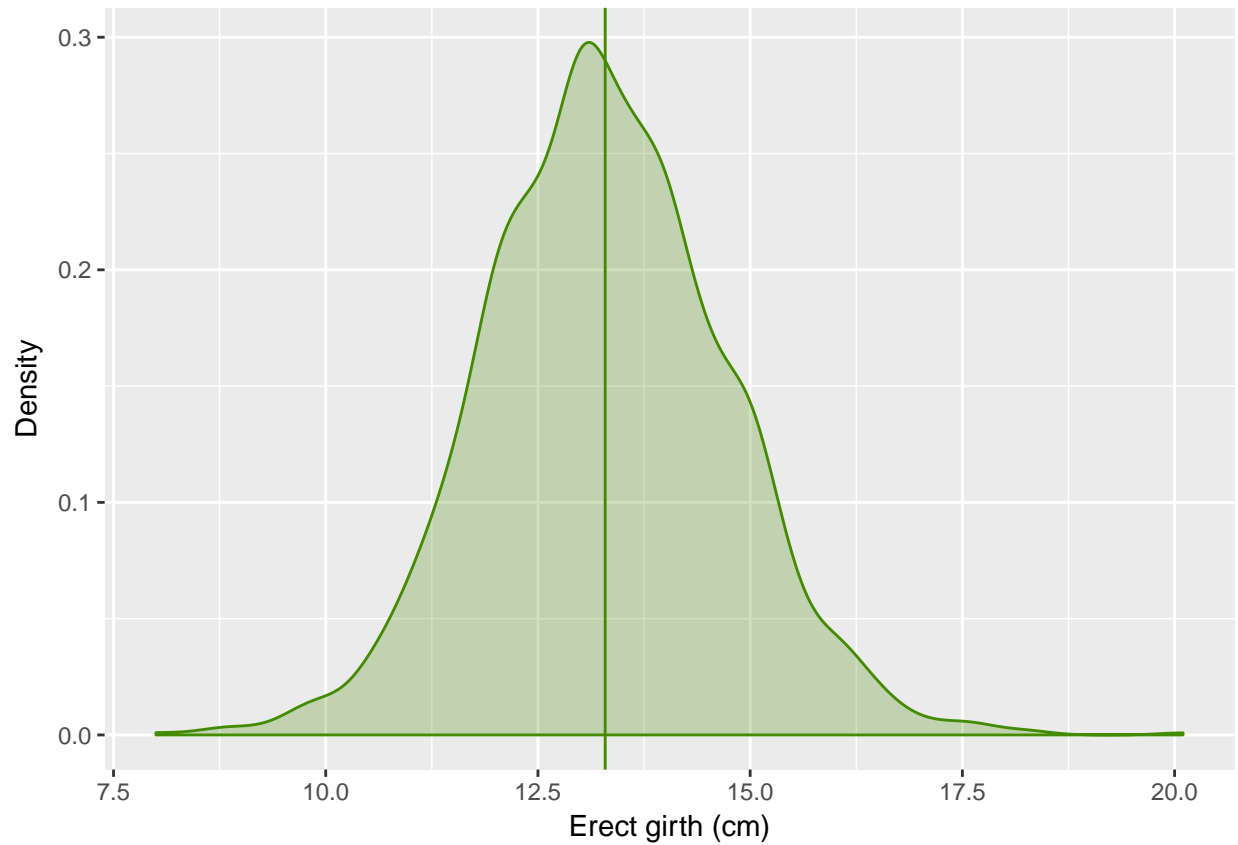


Figure 2: Distribution of girths (green). Vertical line indicates mean girth.

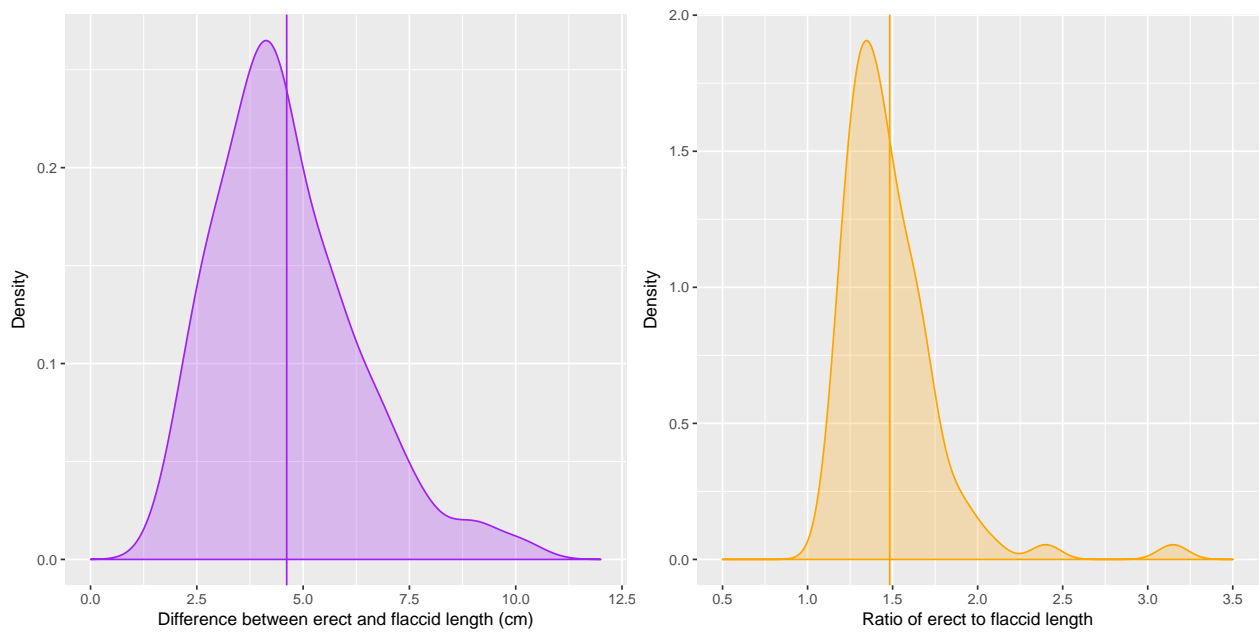


Figure 3: Density plot of difference between erect and flaccid lengths (left, purple) and ratio of erect to flaccid length (right, orange). Vertical line indicates mean difference and ratio, respectively.

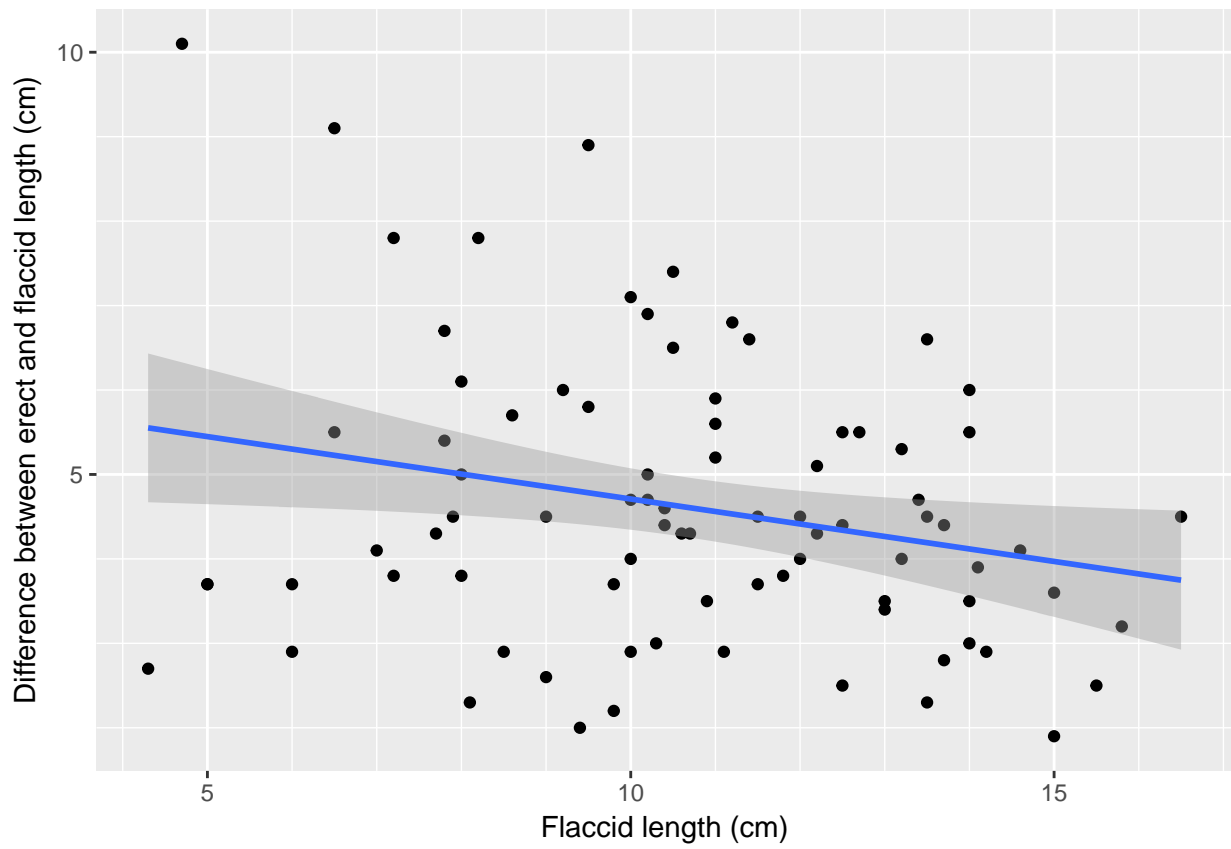


Figure 4: Scatter plot of the difference between erect and flaccid length as a function of flaccid length. Blue line indicates linear regression model. Grey shaded area represents the 95% confidence interval for the slope of the model.

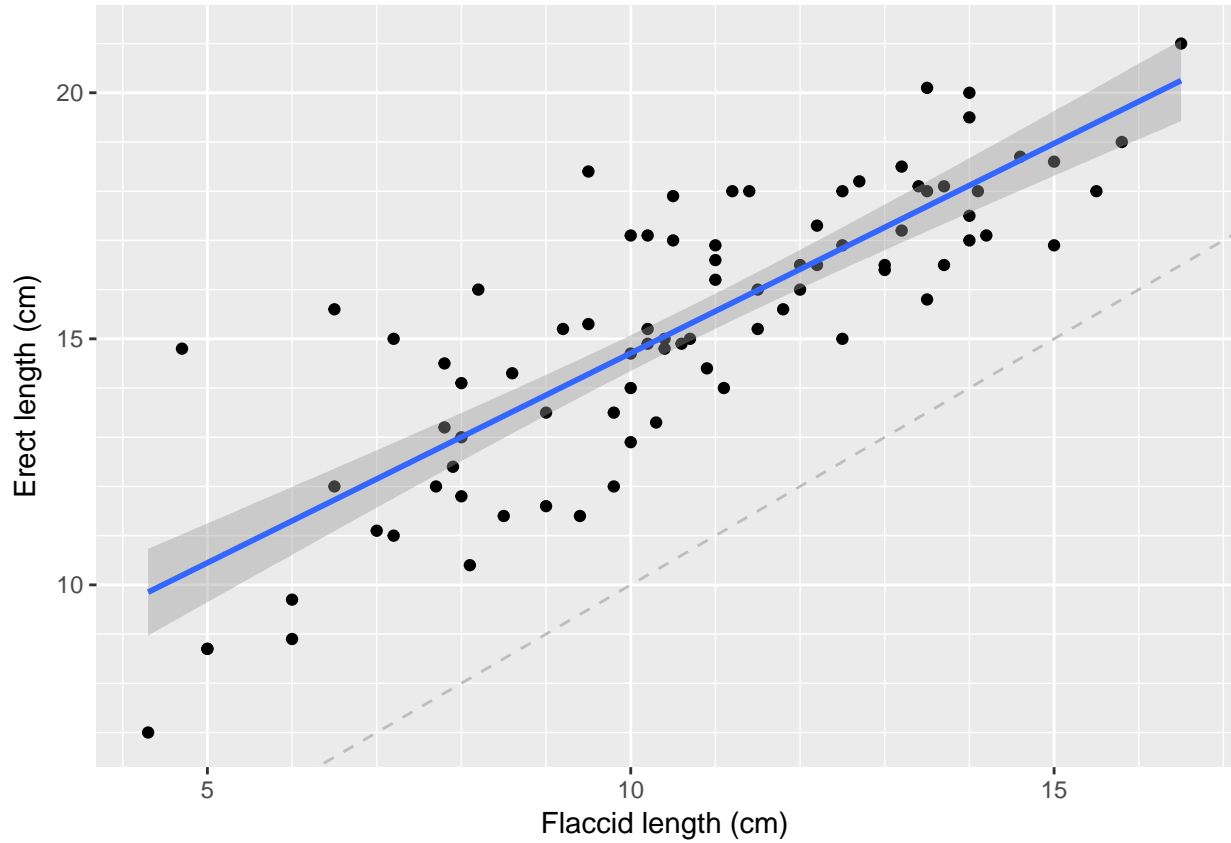


Figure 5: Scatter plot of erect vs flaccid length. Blue line indicates linear regression model. Dashed grey line indicates parity.

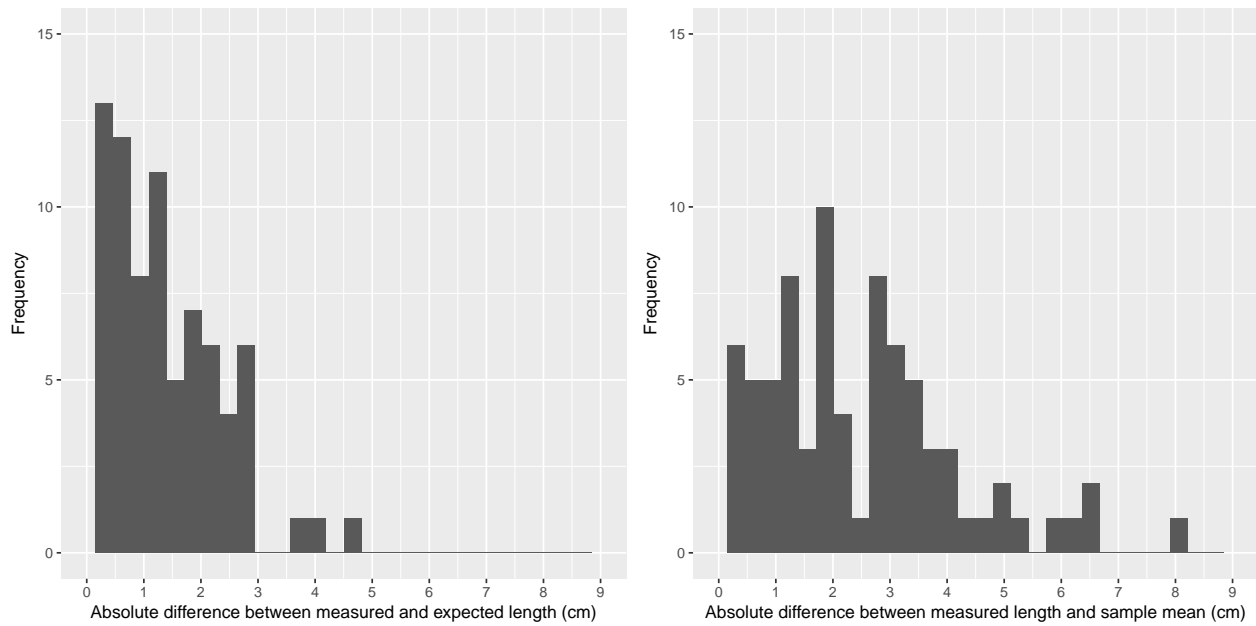


Figure 6: Histogram of differences between measured length and expected length based on linear regression model (left) and histogram of differences between measured length and mean length for sample (right)

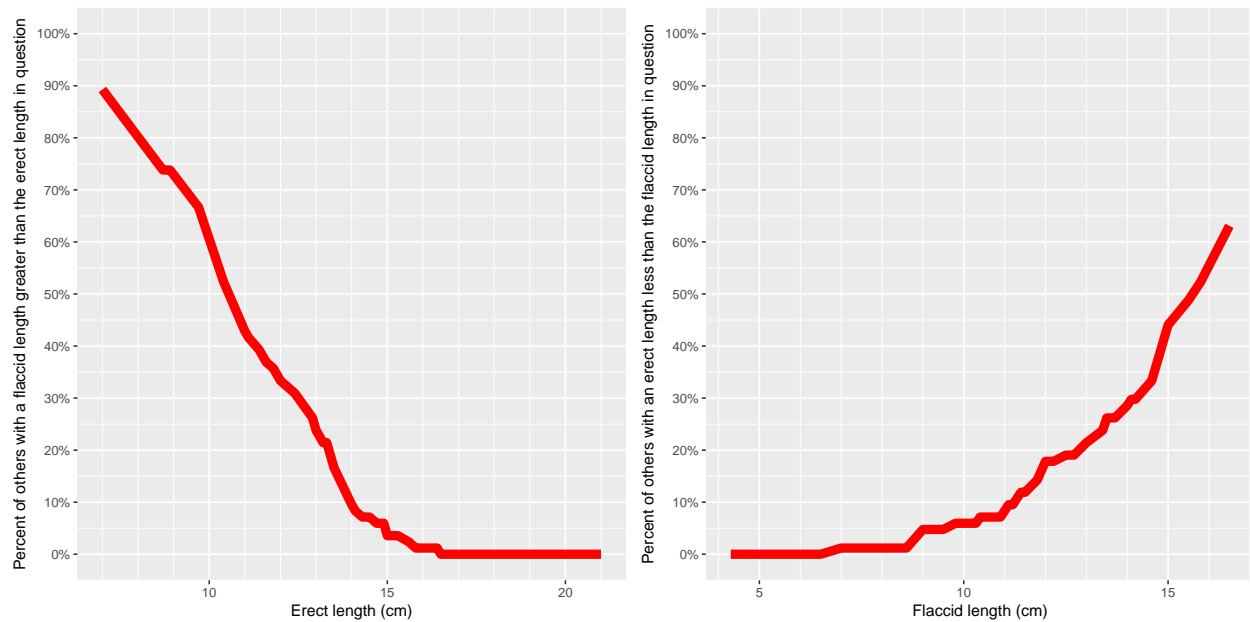


Figure 7: Percent of other users with a flaccid length greater the erect length in question (left); percent of other users with an erect length less than the flaccid length (right)

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