

# Drugs, Supplements, and Complaints

*Measuring misery indices in self-reporting intake ordinated data and comparing with drugs, supplements, and total items taken; nonlinear correlations revealed*

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## ABSTRACT

Self-reported intake data is riddled with errors, however at a high numbers of samples, it may reveal interesting trends which may still be reliable. In this study of 1,014 sample intakes, the numbers of “chief complaints” and “history complaints” are tallied and compared with tallied self-reported pharmaceutical and supplements taken. Ordinal data is used, but not dosages as variations in medications and supplements cannot provide such precision. Results show geometric spikes occur in complaints reported at 7 drugs or supplements, or 7-8 in combination, and again at 13 in combination. Trending sinusoidal behaviors appear also in the data, possibly indicating bell curves within the data. Finally, beyond 14 combined supplements and drugs taken, the number of complaints flat-lines, indicating a complete lack of benefit for the increase in “things taken.” The results indicate potentially causative effects for an increase in “things taken” in generating ailments, though certainly an obvious correlation exists between numbers of drugs and supplements taken and complaints/history. The data indicates that further studies are warranted, albeit limited in final conclusions due to the errors in self-reporting within intakes.

*Key words: drugs - supplements - vitamins - herbs - complaints - misery index - liver damage*



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## Methodology

1,014 chart cases were opened spanning five years of practice. Five sets of data were recorded:

1. Age
2. Self-reported Gender (or if blank, assigned)
3. Weight & Height
4. Number of drugs taken
5. Number of supplements taken
6. Number of chief complaints + number of historical complaints (checkboxes)<sup>1</sup>

The sum of #4 and #5 comprise the item “things taken” (tt). Other than gender, all relevant data are ordinal data. The data were recorded into Google forms to generate a time-stamped spreadsheet<sup>2</sup>.

1,014 cases by Gender | BlueLotusHealth.com | (c) 2018

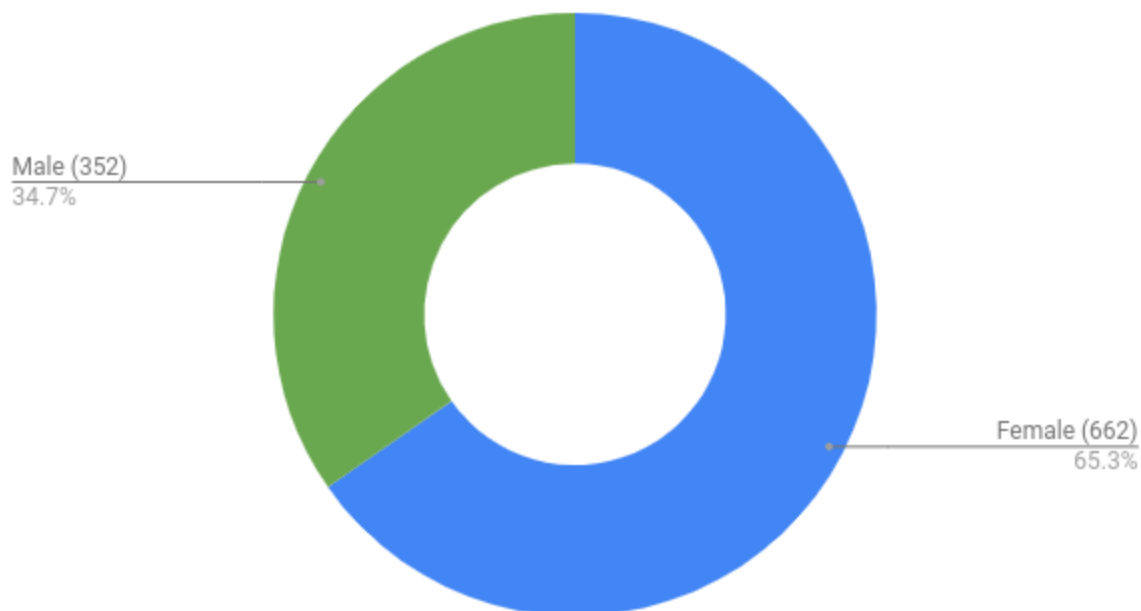


Figure 1: Sample size for Case Study, by Gender

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<sup>1</sup> These fields did not change throughout all 5 years' versions of the intake sheet, available at: <http://bit.ly/2SBinvR>

<sup>2</sup> <http://bit.ly/2yLesnN>

% Patients by group of how many meds | (c) 2018  
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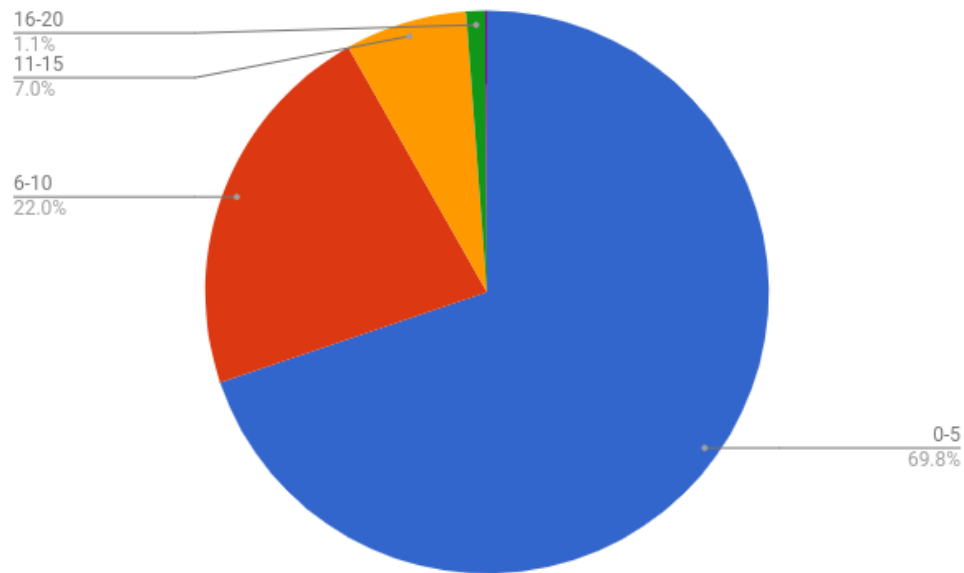


Figure 2: Percentage patients taking various groups (by 5) of meds<sup>3</sup>

Meds Only, % taking | bluelotushealth.com (c) 2018

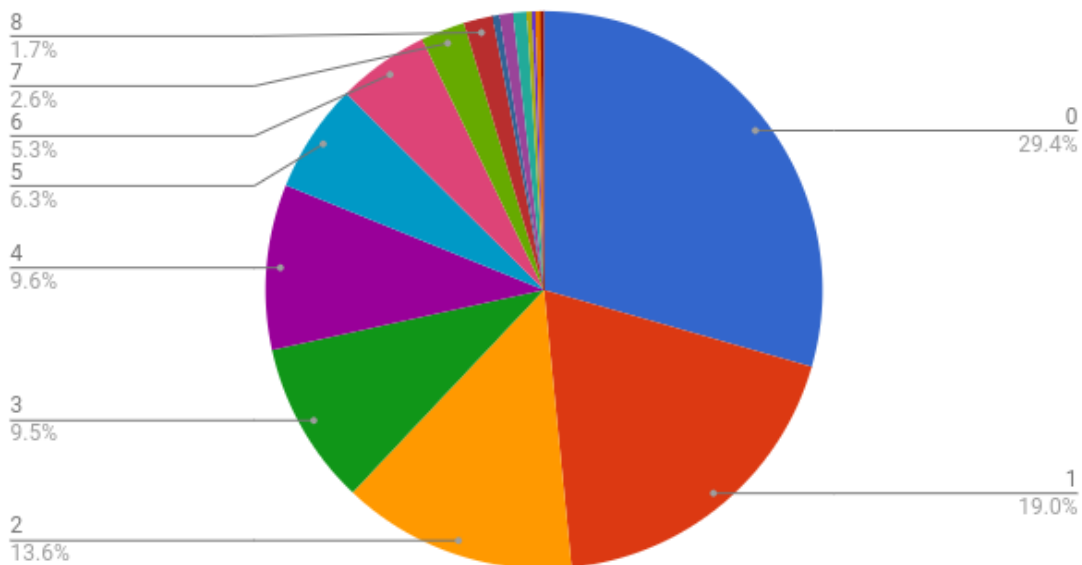


Figure 3: Sample sizes for Meds<sup>4</sup>

<sup>3</sup> Sample size for 16-20 is clearly far too small; only 1 case over 20 reported.

<sup>4</sup> Unknown what % of 0 reported meds are neglected reporting.

### Supplements only, % taking | (c) 2018 bluelotushealth.com

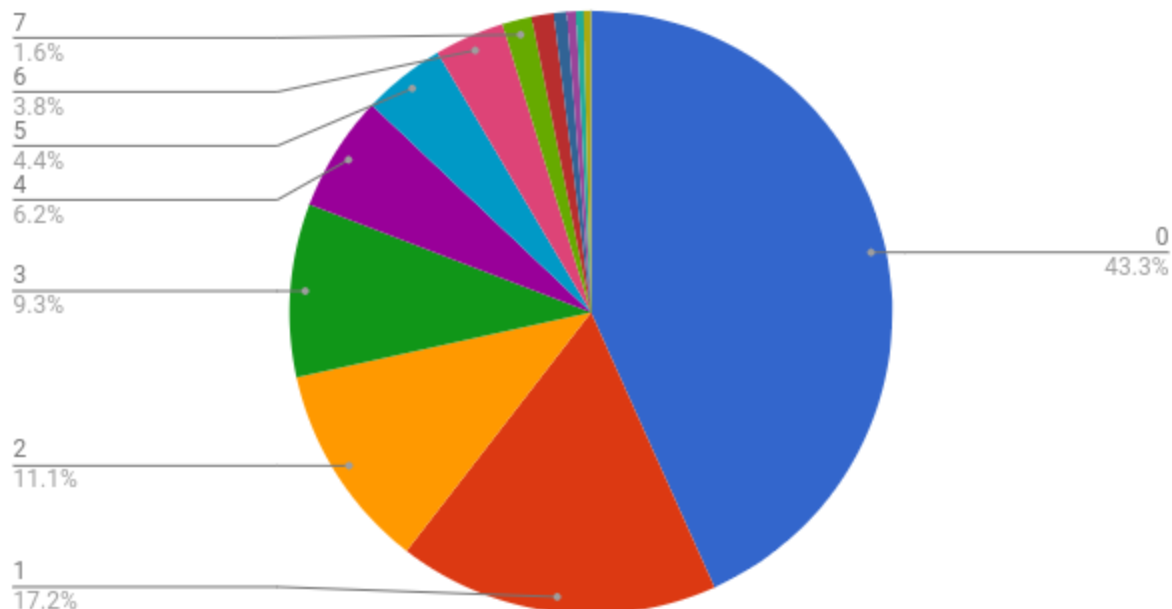


Figure 4: Sample Size for Supplements

### Sample Size vs. Meds+Supplements

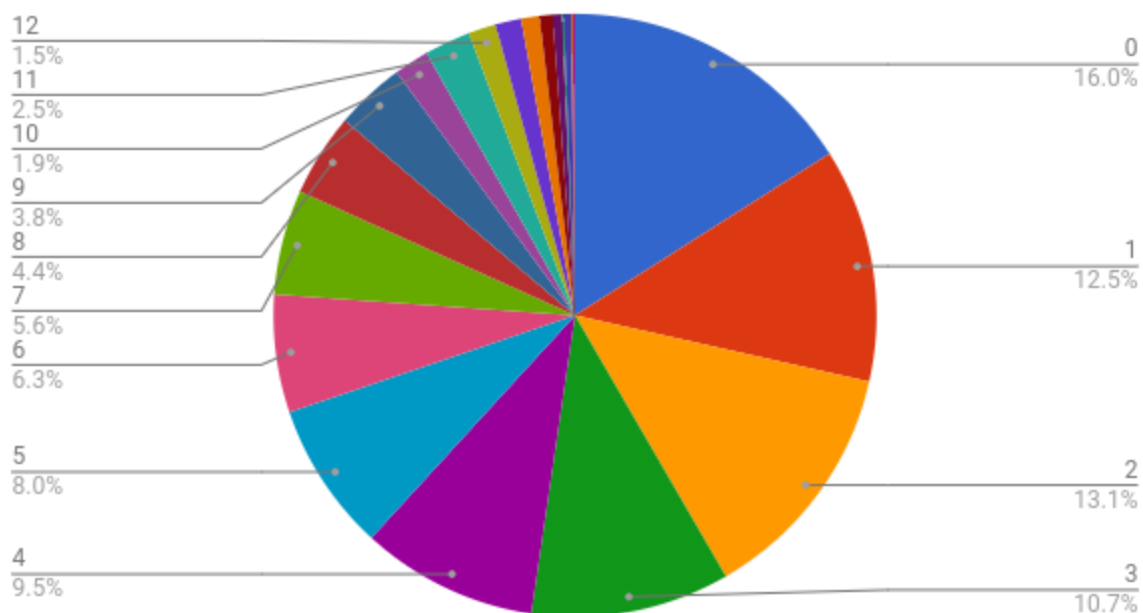


Figure 5: Sample Size for tt

Sample Size (Meds+Supplements) / 1014 People | BlueLotusHealth.com | @ShifuC (c) 2018

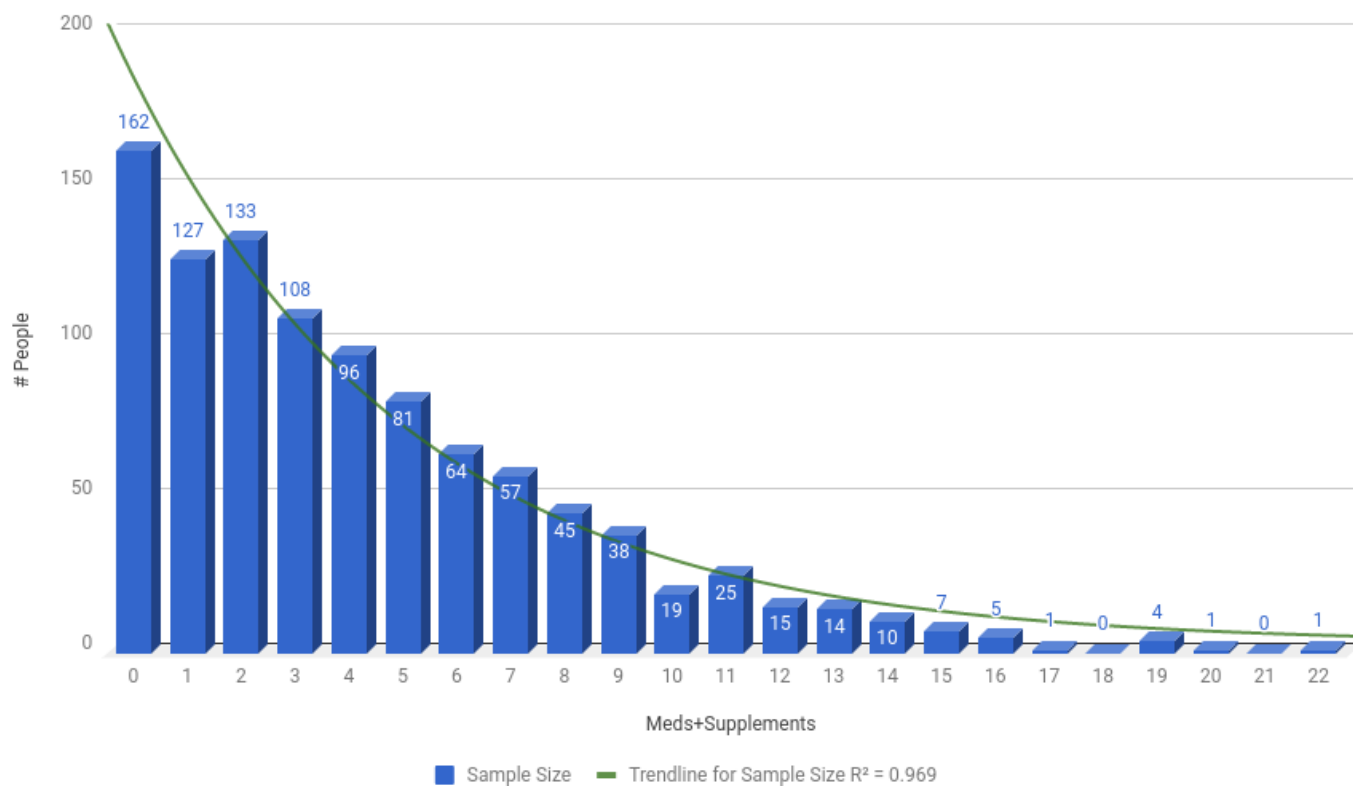


Figure 6: Sample Size for tt by distribution,  $R^2 = 0.969$  <sup>5</sup>

<sup>5</sup> <http://bit.ly/2DemJV3>

## Results

#complaints (avg) reported by med groups | 2018 (c) bluelotushealth.com

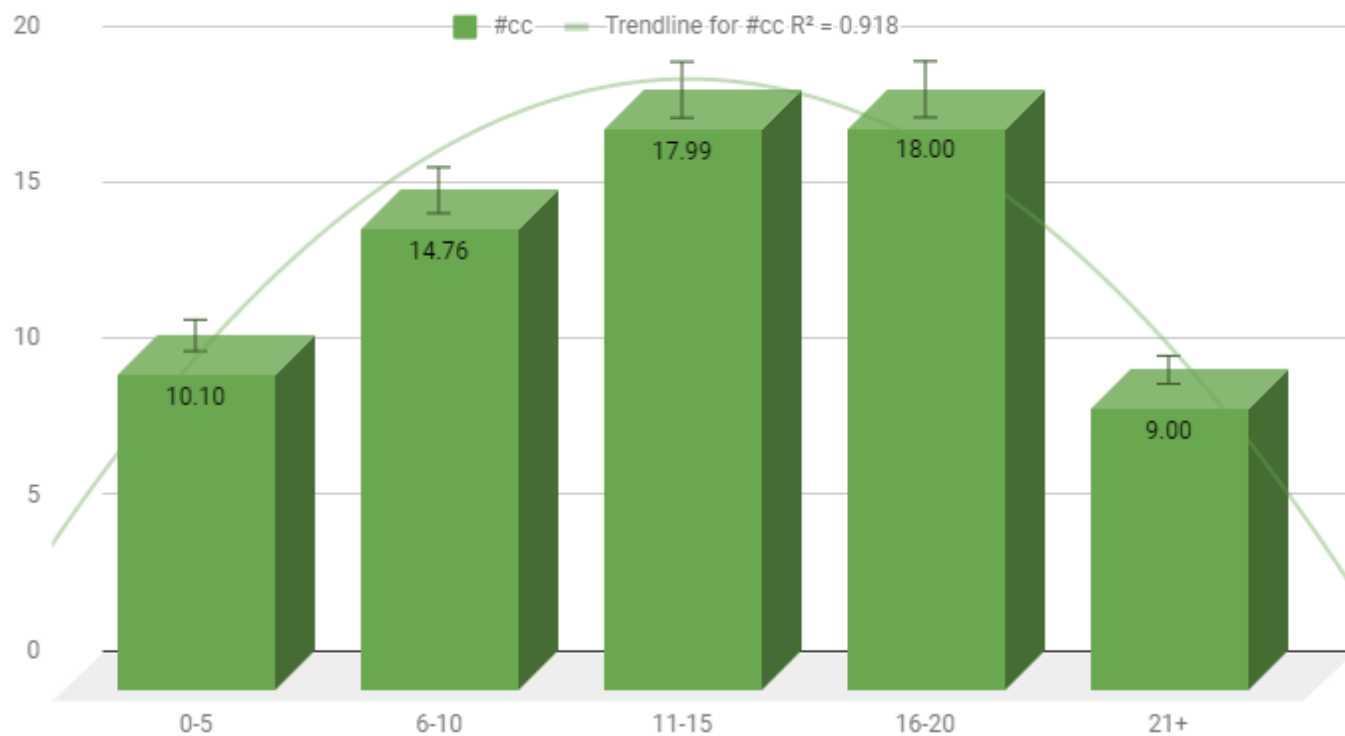


Figure 7: Average complaints by meds grouping, with 5% bars and  $R^2$  of 0.918<sup>6</sup>

<sup>6</sup> Though the trend is parabolic, the last sample is probably far too few

### # Symptoms/cc (avg) vs Meds Taken | bluelotushealth.com (c) 2018

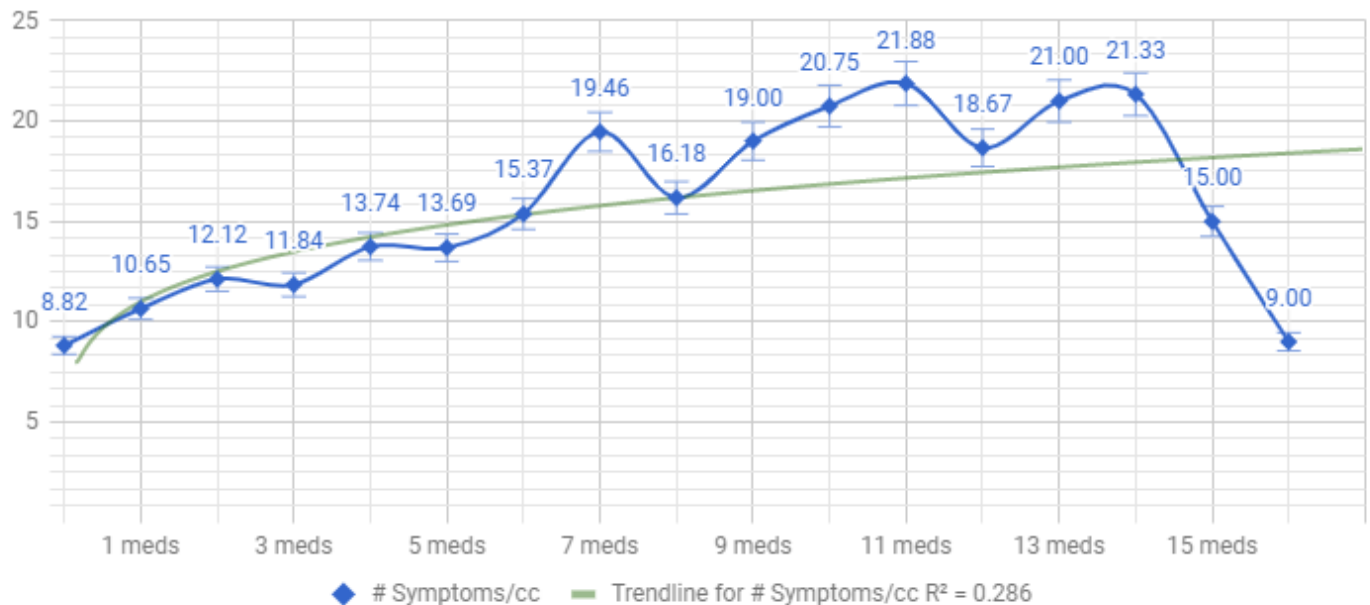


Figure 8: Trend shown for all samples meds' alone considered, 5% error bars and  $R^2 = 0.286^7$

### # Symptoms/cc (avg) vs Supplements Taken | bluelotushealth.com (c) 2018

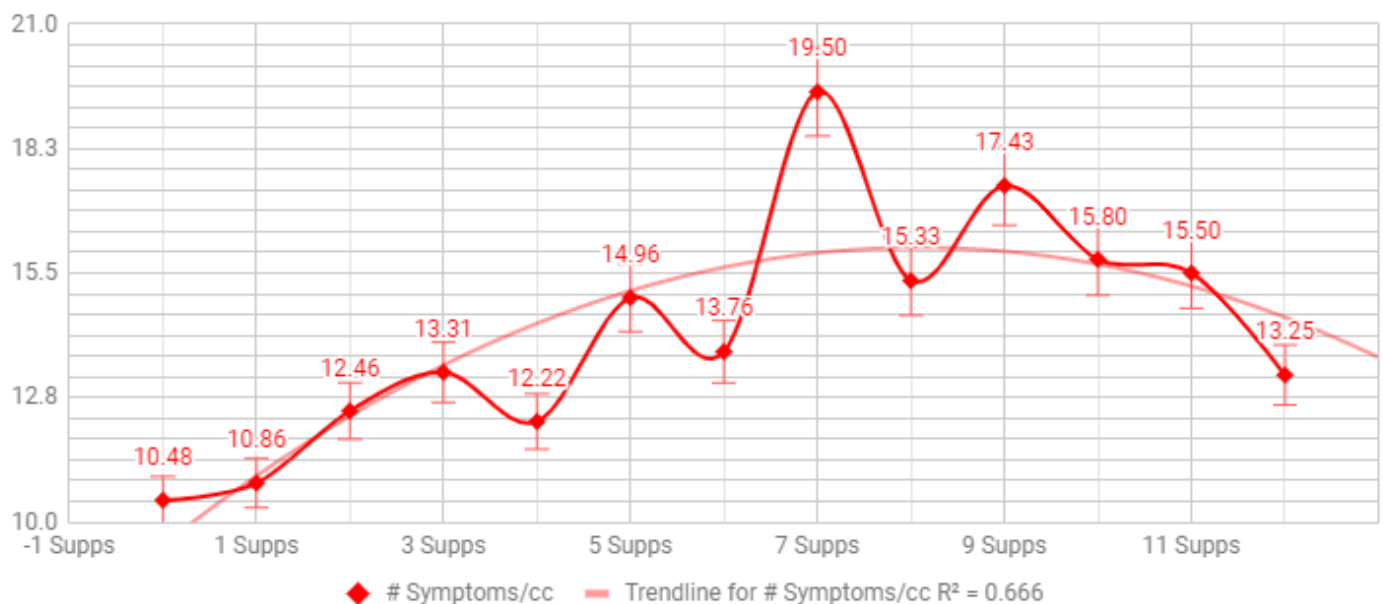
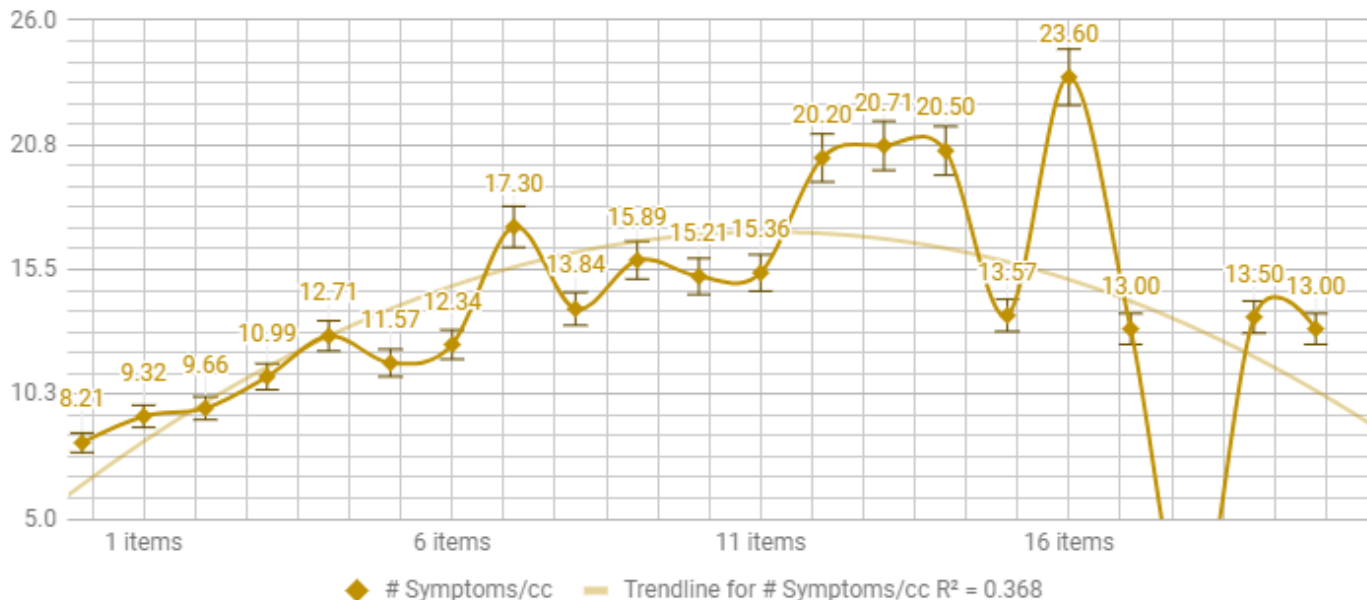


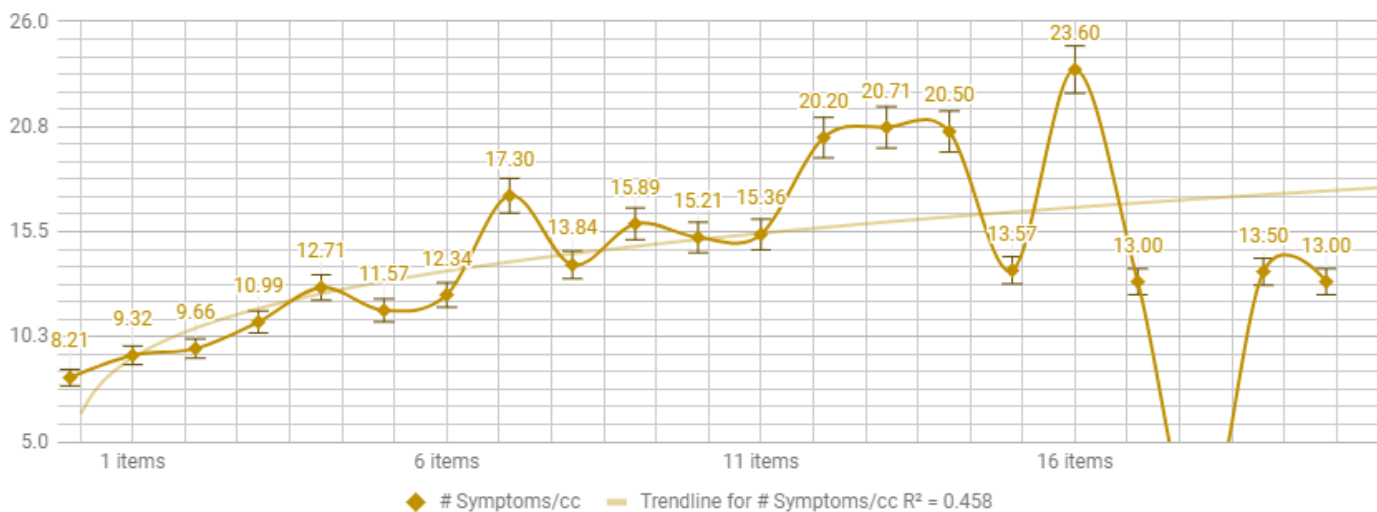
Figure 9: Trend shown for all samples supplements alone considered, 5% error bars and  $R^2 = 0.666$   
Note the parabolic shape, again, vs. exponential regression probably due to sample size issues on higher end.

<sup>7</sup> Ruined probably by the end low samples, however, the trend cannot be effective with the obvious spiking occurring.

## # Symptoms/cc (avg) vs Things Taken | bluelotushealth.com (c) 2018

Figure 10: Plot of all samples, all tt, 5% error bars,  $R^2 = 0.368$  (polynomial)

## # Symptoms/cc (avg) vs Things Taken | bluelotushealth.com (c) 2018

Figure 11: Same plot, with Power Series regression, best  $R^2 = 0.458$ 

The inability to find any reasonable regression demonstrates the non-linearity of this data. Again, the highest samples are probably not conducive to finding real answers, for numerous reasons, but chief among them are sample size<sup>8</sup>. The chief trends of interest are the spikes at 7-8 and 11-12 and 15-16 tt.

<sup>8</sup> The others being omitted reportings of meds, herbs, vitamins, and lack of honesty or congruence in patients with such high numbers of tt, in not reporting all complaints or being flippant (as the experience of the author brings to bear) about



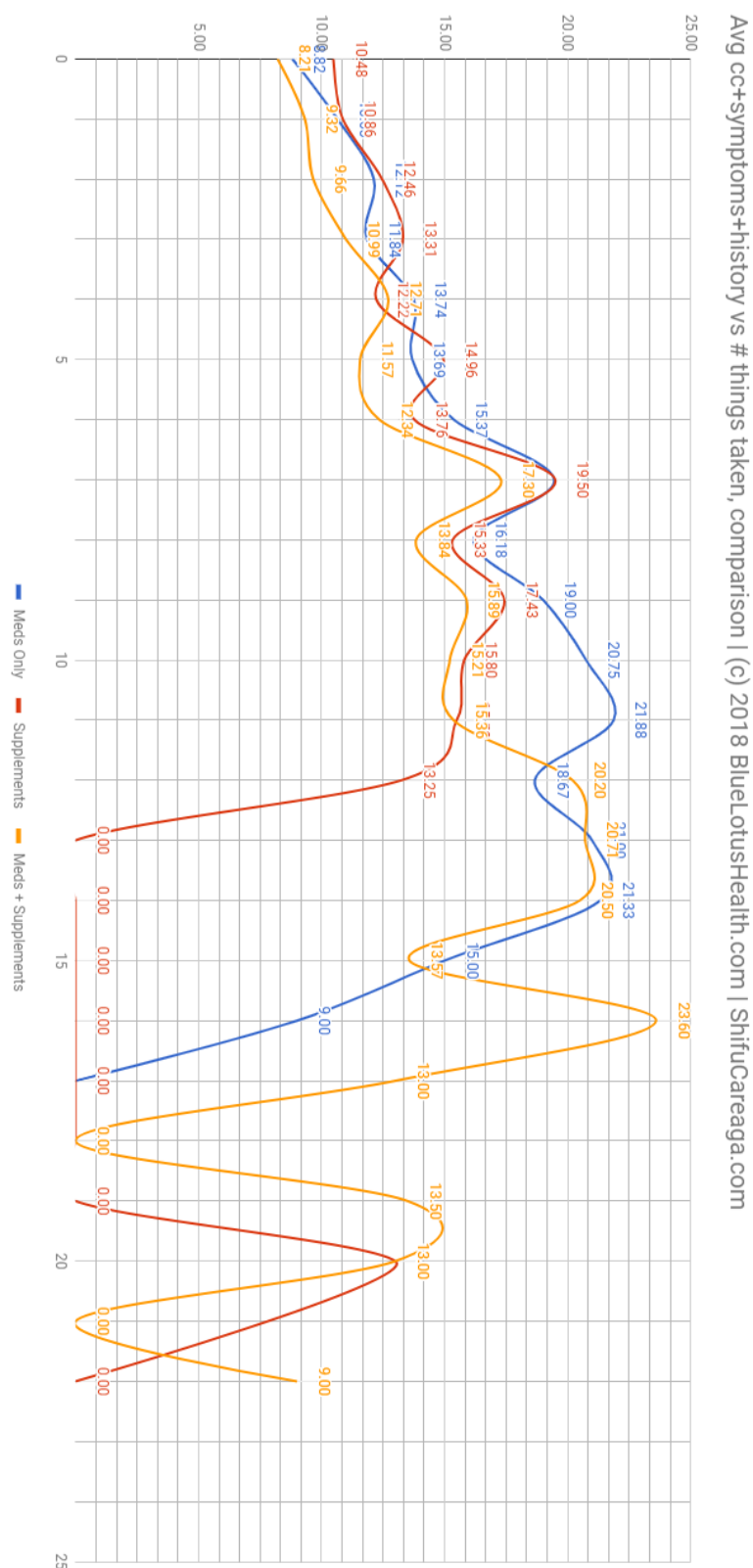


Figure 12: All plots on same graph

< expected linear trending

< Unexplained concurrent spike, then dip

< weakness in med sample? Or reporting?

< no meds reported in this group, expected trend unavailable (tt ruled by supplements)

< concurrence? Does this mean the trend is parabolic, after all? Is that a reflection of the patient base or the actual complaint values? There is no way to know since supplements aren't represented (all of them included in tt). It is interesting to note that no patients report taking 20+ supplements, but the author suspects it happens.

## Discussion

The confidence in the linear trend and first spike(s) is very high, because of the sample rate remaining high for 14 and less tt reported. This trend of unexplained spikes might be due to sudden changes in health presentation which urge a worried population to “do something” and so they come in and complain *more* than average. The author does not buy this hypothesis, however for the simple reason of the immediate valley that forms afterwards. There is no discernable reason why closely sampled individuals with only 2 more meds or supplements reported would be less concerned with their health. Instead, it may be that some real, complaint-suppressing factor appears beyond the spike event. The data seems to indicate that the most dangerous place to be, clinically, is within the group with spiking symptoms and complaints reported. Typical advice would be to take less, but an informed doctor, herbalist, or nutrition specialist might actually find something worth adding (such as a nutrient, mineral, fungi, etc...) to also bring the patient within the valley groups.

The typical explanation for the linear portion of the trend is that the patients with more complaints, take proportionally more items for symptoms. However, do note that the trend is not a scalar of 1:1 but approximate 4.6:6 or about 3:4. So they increase their “doses” faster than the symptoms increase.

Perhaps the key to explaining the spikes lies in the concept of “snapback.” In medicine, frequently plateaus<sup>9</sup> occur and then nature rushes to catch up. This snapback may come in the form of a surge upward. The line from the average of spikes to the origin is 9.6:7 or 137% grade, this would suggest a huge increase in symptoms per “thing taken.”

Another way at looking at Figure 12 is that the trend is linear-like (with sinusoidal waves) upwards and then flat-lines across. Suggesting both no *new* problems (or perhaps only the same number of worse complaints, and forgetting of less severe ones?) and also that there is no benefit (although there certainly could be and there would be harm to the liver and finances) to taking more and more, as there isn't a detectable decrease in complaints until the data reaches too small of sample sizes to be conclusive.

## Criticisms

The primary criticism, by far, will be the self-reporting aspect<sup>10</sup>. Patients are renowned for lying (self-reporting bias<sup>11</sup>) in intake data, omitting data, especially that which they deem unnecessary to add. Some view Chinese medicine like massage and purposefully omit useful medical reporting data. It would be useful to do an analysis of confidence in especially the 0 tt category to see what care was put into filling out all fields on the intake form. Conversely, some people put everything to the point of suspicion. They make check mark inappropriate histories, diagnoses, or write and rewrite the same things. For example some might write Anxiety, meaning both anxiety and depression, while others will put both. The assistant for the project was instructed to count entries and checkboxes, and not make judgement calls as pertains to the accuracy of the data presented.

Because the data is ordinal, that may also skew results. The most classic representation is in the supplements, when a patient will say that they take several vitamins, and another will simply write “multivitamin.” If that is truly what they take, that is a single item, but of course they might mean that as a form

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<sup>9</sup> For example, in weight loss, <https://clinicaltrials.gov/ct2/show/NCT02199483>

<sup>10</sup> [https://www.mayoclinicproceedings.org/article/S0025-6196\(15\)00394-8/pdf](https://www.mayoclinicproceedings.org/article/S0025-6196(15)00394-8/pdf)

<sup>11</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4862344/>

of shorthand. Frequently people forget their meds, as well, particularly heart patients will omit “baby aspirin” in either category. Such supplements, like CoQ10 or Red Yeast Rice might also be prescribed but written in supplements, or vice versa.

The data itself is highly suspect and the author has little to no confidence in its accuracy as a report of the state that things actually exist in. Considering how few people report constipation, dysmenorrhea, and recreational or medical marijuana use, or deny their alcohol intake is substantial enough to be considered a medicine; this is not surprising.

However, as a 1,014 sample aggregate, and given the correlation of the spike occurring whether one considers the sample group (as a whole) as meds alone<sup>12</sup>, supplements alone, or a tally of them... this can be considered substantial. Concerns about self-reporting errors in nutrition have been addressed in literature.<sup>13</sup>

Future studies should come from different types of intake sheets, and without expecting the same averages, look for similar trends. Other approaches to self-reporting may also exist<sup>14</sup>. To eliminate the parabolic or suspected parabolic regression, perhaps a sample size of 10,000 or more will provide enough patients that take 20 or more for each category.

Also, it may be improved if instead of transfer from paper if things were entered into a computer to start. However, the reality is many people may under-report for annoyance of using screens in excessive amounts of time.

## Conclusions

Concurrent consumption of medications and supplements appears to have no major benefit over the number complaints shown in medication or supplement only groups. They see the same spike in complaints at 7 things taken, regardless. This spike is unexplained, though followed by a dip that returns to the linear progression. Otherwise, at high samples, the trend appears to flatline or even become parabolic, though sample sizes for large groups are too small to be conclusive.

Self-reported intake data is individually highly suspicious, so trials such as these must rely on sufficiently sized sample groups (>1,000 or more).

Results show there may be a benefit to adding or subtracting from certain group sizes in order to help patients align with a more balanced (less complaining) cohort that demonstrates better values.

The slope of linear increase is not 1:1 and suggests either less benefit per thing taken, or perhaps a suppression of symptoms which spikes later on. Snapback phenomena may be related to well known health plateaus. The combination of meds and supplements provides much better sample data for the entire experiment, producing high averages that show the flatline trend. This flatline suggests either a lack of benefit (and therefore real harm to the liver) for high tt groups, or even demonstrates a lack of coherence in self-reporting honesty among cohorts which take excessive amounts of medications or supplements. This does not address the groups separately, and no comparison can be made to either group as to which is more healthy, although more people reported taking high amounts of supplements than of medications. Human error (especially memory in elderly) may be involved, or downright dishonesty, but the trends remain fertile for consideration of possible meanings.

The author recommends a separate clinic with a different intake form repeat the study, to compare results.

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<sup>12</sup> Bear in mind this isn't isolating people who say they *only* take meds or supplements... it means just tallying data as it pertains to these aggregates.

<sup>13</sup> <https://academic.oup.com/jn/article/145/12/2639/4585705>

<sup>14</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1466792/>

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