Reproducible Research Demo using the PLoS template

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Abstract

The *Breeder diet* produces the highest growth in baby chicks after 21 weeks. The *Grower diet* produces the least growth in baby chicks after 21 weeks.

Author summary

Please keep the Author Summary between 150 and 200 words Use first person. PLoS ONE authors please skip this step. Author Summary not valid for PLoS ONE submissions.

Introduction

The research question this paper attempts to answer was generated by the following communication:

> From: Ben Chan
> Sent: Thursday, June 11, 2015 4:04 PM
> To: Stephanie Renfro
> Subject: What to feed chicks
>
> Hello,
>
> I'm receiving 20 baby chicks next month. Can you help me decide what to feed them? I'm choosing between the following four diets:
>
> 1. Grower diet
> 2. Layer diet
> 3. Breeder diet
> 4. High cluckage diet
>
> Thanks, Ben

Cite some fake references just to show how referencing using the `bibliography` parameter works [1] [2] [3] [4].

This paper uses data from an experiment on the effect of diet on early growth of chicks, `ChickWeight`, which comes pre-loaded in any R session. Unfortunately, R does not come pre-loaded with a llama dataset.

Convert to data.table for faster processing.

```
library(data.table, quietly=TRUE)
ChickWeight <- data.table(ChickWeight)
```

Create a character variable for `diet`. Use this variable for plotting small multiples.

```
ChickWeight <- ChickWeight[, dietChr := sprintf("Diet %d", Diet)]
```

The first few rows of this data are shown below.

```
head(ChickWeight)
```

```
   weight Time Chick Diet dietChr
1:     42    0     1    1  Diet 1
2:     51    2     1    1  Diet 1
3:     59    4     1    1  Diet 1
4:     64    6     1    1  Diet 1
5:     76    8     1    1  Diet 1
6:     93   10     1    1  Diet 1
```

Results

Simple summary

Below are summary statistics of all the variables of the data.

```
summary(ChickWeight)
```

```
     weight           Time           Chick     Diet      dietChr
 Min.   : 35.0   Min.   : 0.00   13     : 12   1:220   Length:578
 1st Qu.: 63.0   1st Qu.: 4.00   9      : 12   2:120   Class :character
 Median :103.0   Median :10.00   20     : 12   3:120   Mode  :character
 Mean   :121.8   Mean   :10.72   10     : 12   4:118
 3rd Qu.:163.8   3rd Qu.:16.00   17     : 12
 Max.   :373.0   Max.   :21.00   19     : 12
                                 (Other):506
```

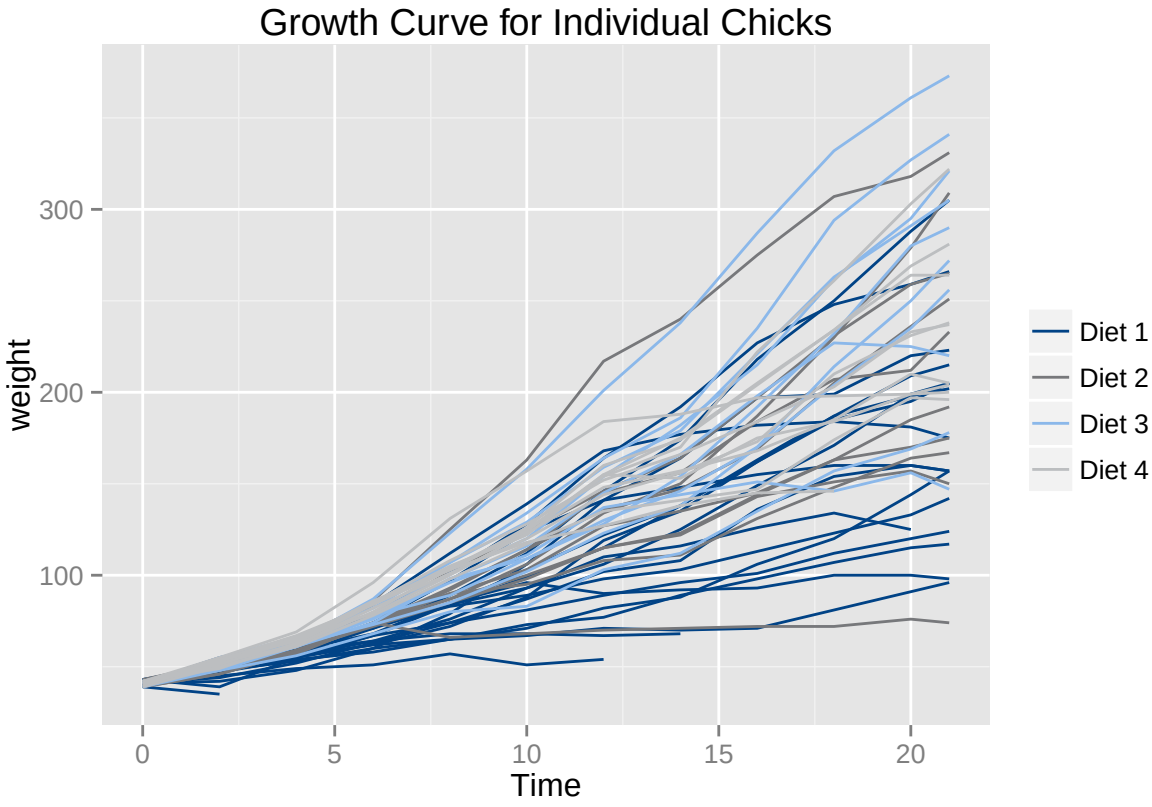
Mean weights

Just for fun, let's create a table showing mean weight at times 0, 10, and 21 days, for each of the four diet types.

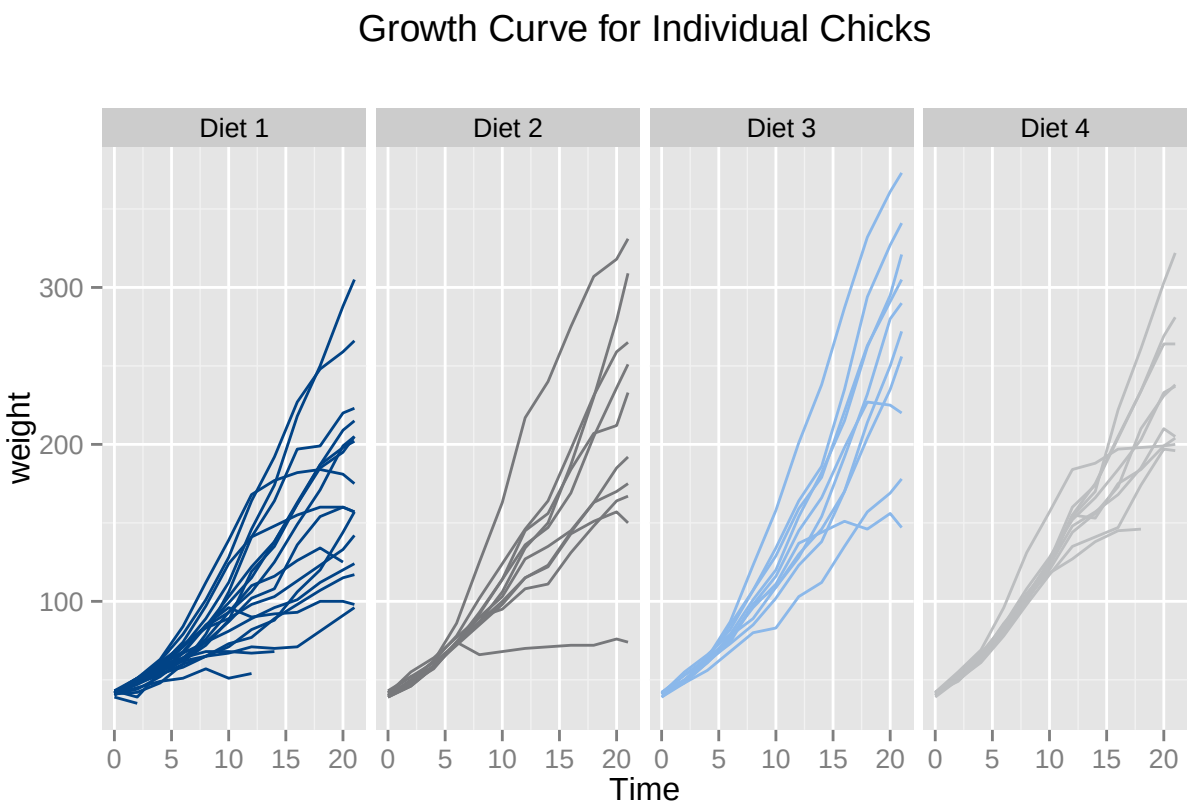
Diet	Time	mean_weight
1	0.00	41.40
1	10.00	93.10
1	21.00	177.80
2	0.00	40.70
2	10.00	108.50
2	21.00	214.70
3	0.00	40.80
3	10.00	117.10
3	21.00	270.30
4	0.00	41.00
4	10.00	126.00
4	21.00	238.60

Growth curves

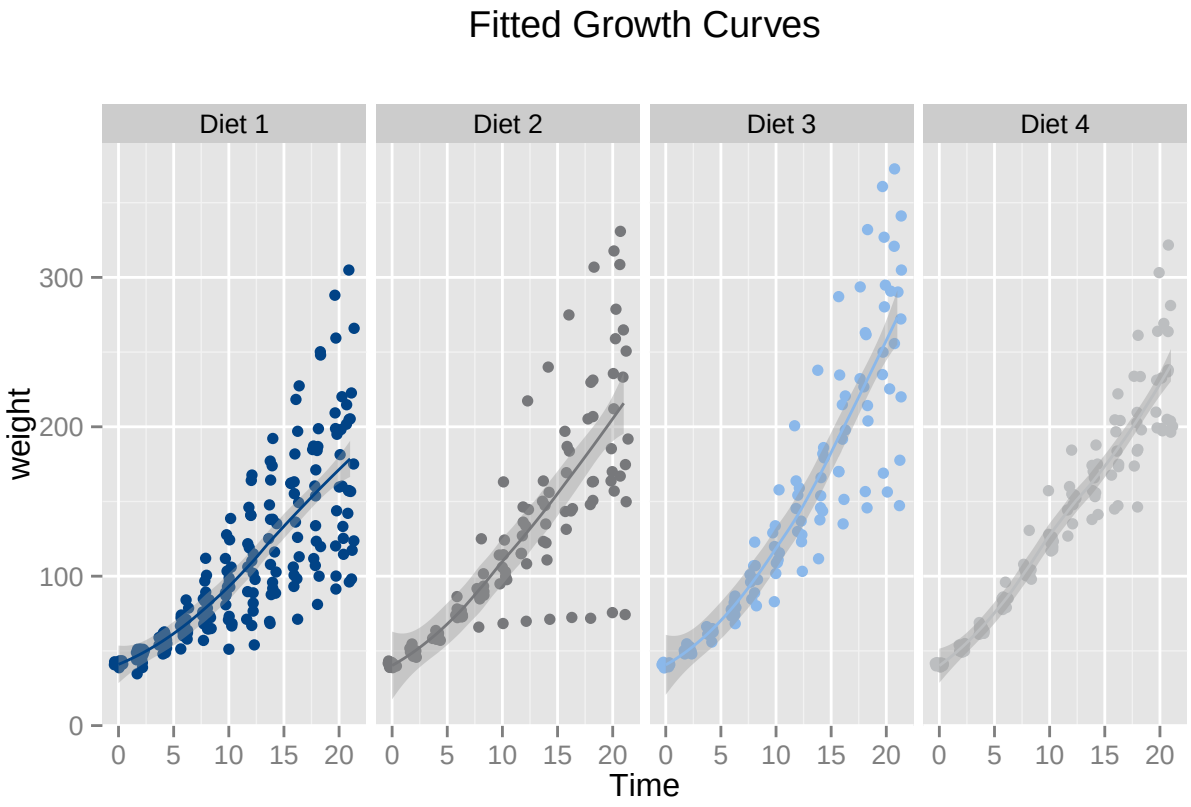
The following plot illustrates the growth curve for individual chicks from 0 to 21 days.
Colors represent the four diets.
From this plot, it is difficult to distinguish between the performance of the four diets.



Plot individual chick growth curves using small multiples.

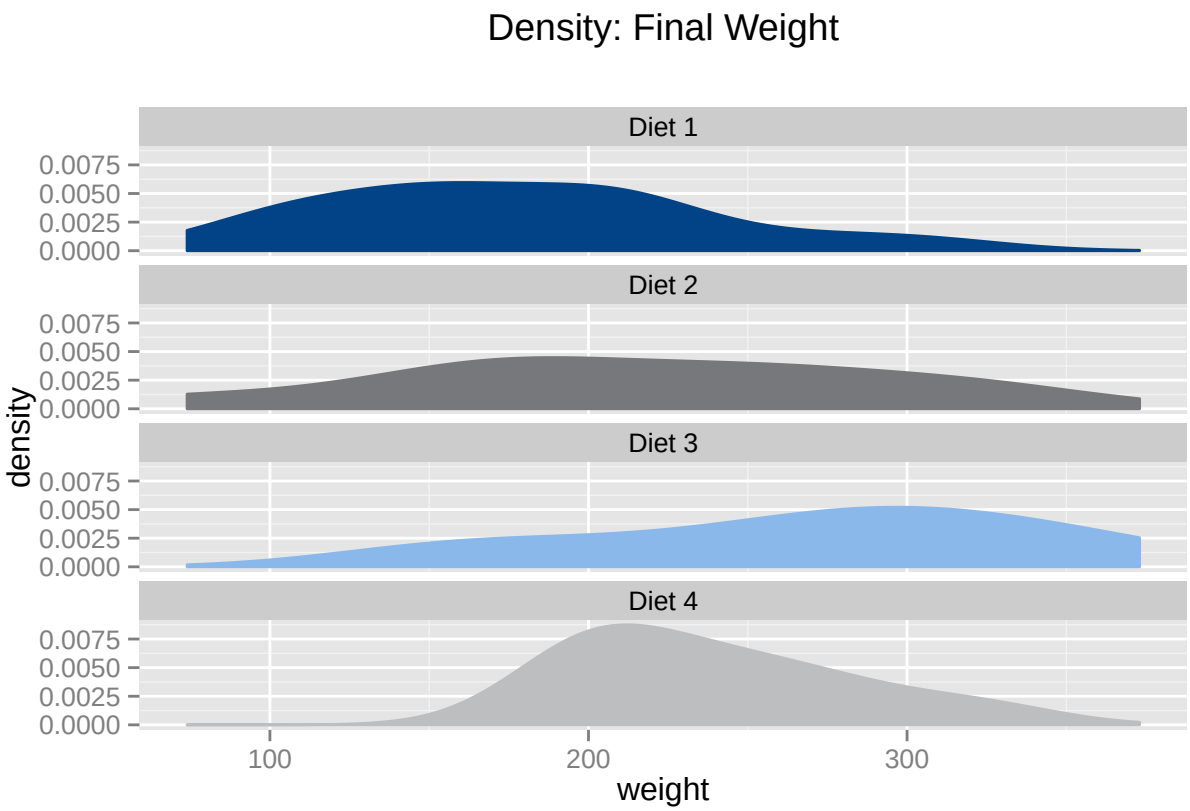


Plot fitted growth curves using small multiples. Data points are jittered around time value.



Final weight density

Plot densities by diet for chicks' final weights (day 21) using small multiples.



Discussion

Reproducibility rocks! End of discussion.

Material and Methods

Information on the R session that generated this paper is below.

```
sessionInfo()
```

```
R version 3.1.3 (2015-03-09)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 7 x64 (build 7601) Service Pack 1

locale:
[1] LC_COLLATE=English_United States.1252
[2] LC_CTYPE=English_United States.1252
[3] LC_MONETARY=English_United States.1252
[4] LC_NUMERIC=C
[5] LC_TIME=English_United States.1252
```

```
attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
[1] ggplot2_1.0.1    xtable_1.7-4     data.table_1.9.4

loaded via a namespace (and not attached):
 [1] chron_2.3-45     colorspace_1.2-6 digest_0.6.8     evaluate_0.7
 [5] formatR_1.2      grid_3.1.3       gtable_0.1.2     htmltools_0.2.6
 [9] knitr_1.10.5     labeling_0.3     magrittr_1.5     MASS_7.3-40
[13] munsell_0.4.2    plyr_1.8.2       proto_0.3-10     Rcpp_0.11.6
[17] reshape2_1.4.1   rmarkdown_0.6.1  rticles_1.0      scales_0.2.4
[21] stringi_0.4-1    stringr_1.0.0    tools_3.1.3      yaml_2.1.13
```

Acknowledgments

Do NOT remove this, even if you are not including acknowledgments

References

A reference list should be automatically created here. However it won't. Pandoc will place the list of references at the end of the document instead. There are no convenient solution for now to force Pandoc to do otherwise. The easiest way to get around this problem is to edit the LaTeX file created by Pandoc before compiling it again using the traditional LaTeX commands.

Figure Legends

Tables

1. Englander H, Michaels L, Chan B, Kansagara D (2014) The Care Transitions Innovation (C-TraIn) for Socioeconomically Disadvantaged Adults: Results of a Cluster Randomized Controlled Trial. J Gen Intern Med.

2. Norris SL, McNally TK, Zhang X, Burda B, Chan B, et al. (2011) Published norms underestimate the health-related quality of life among persons with type 2 diabetes. J Clin Epidemiol 64: 358–365.

3. Melnikow J, Kulasingam S, Slee C, Helms LJ, Kuppermann M, et al. (2010) Surveillance after treatment for cervical intraepithelial neoplasia: outcomes, costs, and cost-effectiveness. Obstet Gynecol 116: 1158–1170.

4. Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, et al. (2009) Screening for breast cancer: an update for the U.S. Preventive Services Task Force. Ann Intern Med 151: 727–737.