

<b>Course website</b>	<a href="http://www.stat.wisc.edu/courses/st572-larget/">http://www.stat.wisc.edu/courses/st572-larget/</a>
<b>TA</b>	Xu He(Mario)
<b>Email</b>	hexu@stat.wisc.edu
<b>Website of TA</b>	<a href="http://www.stat.wisc.edu/~hexu">www.stat.wisc.edu/~hexu</a>
<b>Office</b>	1275F, MSC
<b>Office hour</b>	Th 11:00-12:00, 4:00-6:00
<b>Phone</b>	(608)334-9792

## 1 A Generalized linear regression problem

Data from an experiment to see how an educational program on the importance of using gloves affected the rate of glove use by a group of nurses in an inner-city pediatric hospital emergency department. Without their knowledge, the nurses were observed during vascular access procedures before and one, two, and five months after an educational program to see how often they wore gloves. Each procedure by a nurse was counted as a separate observation.

Missing values are indicated by large dots.

1. Period: Observation period (1 = before intervention, 2 = one month after intervention, 3 = two months after )
2. Observed: Number of times the nurse was observed
3. Gloves: Number of times the nurse used gloves
4. Experience: Years of experience of nurse

See <http://lib.stat.cmu.edu/DASL/Datafiles/Nurses.html> for details.

Here we want to see the effect of educational program and nurse's experience, therefore we will ignore the effect of individuals and use Period and Experience as explanatory variables.

- (a) Explain why we need logistic regression to address this question. How do we organize these data?
- (b) Fit a generalized linear regression model to organized data, using period, experience and their interaction. Should we treat period as a factor or a numerical variable?
- (c) Draw some plots to see what the model looks like. Make some predictions.
- (d) Use plots to interpret all 6 coefficients.
- (e) Are there other models you can think of? Fit several other generalized linear models and compare them.