Dear Colleagues,

This past semester I become more interested in a phenomenon that most of us will have experienced if we teach a largish class. There seemed to be a very large number of grandmothers who had died during the semester. Moreover, students felt that this had derailed their efforts in my course. In particular, in my Spring 2006 Psychology 205 (Perception) class, with an enrollment of 201 students, 5 different students came up to me before the exam explaining that this had been a rough semester for them because their grandmother had died. (And, of course, they wanted some extra consideration.)

Now, I had always thought that in a largish class this kind of thing would happen, but 5 grandmothers? Obviously, each student has the potential of having two, so I wasn’t sure? So I decided to do some digging, and actually enlisted my younger daughter to do this as a project in her AP Stats class at Ithaca High School.

The students in my class are roughly equally divided among freshmen, sophomores, juniors, and seniors. Thus, their average age was 19.5 (born in 1985). Looking up the actuarial data on the US Census site I found that the average age of childbirth for all mothers of this cohort is 25.5 ; thus, they were likely born in 1959 (assuming this population is like that for the US as a whole, and that the Cornell student is on average the middle child). The average age for the grandmothers of these students when their mother was born was 25 (again assuming the mother was the middle child). Thus, the average grandmother was born in 1934. It follows, then, that the average age of the grandmothers would likely be 71 or 72 in the Spring of 2006.

Now, not all grandmothers survive to see their grandchildren in college. Census data tell us that the probability of survival to 2006 for women born in 1934 who lived to bear children in 1959 is .86. Thus, for 201 students there would likely be 201*2*.86, or 346 grandmothers, 1.72 grandmothers per student.

The US Census reports that the probability of a 72-year-old person born in 1934 dying within a year is .01953. Thus, the probability of that person dying within a 4-month (or semester-long) span is roughly .01953/3 or .00651.

Therefore, for my class the number of grandmothers one would expect to die during the semester is 201*1.72*.00651, or 2.25. More generally, this is 1.12 grandmothers per 100 students per semester – a number you might choose to remember.

But 5 grandmothers? Well, the likelihood of this is \( p = .0506 \). Cautiously, I suggest that some student’s grandmothers did not actually die. But then again, I have taught the course 21 times at Cornell and it is only this year that I cared to query this.

Respectfully (and precisely),

James Cutting