

## **MCHB/EPI Atlanta GA Conference**

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### **The Life and Legacy of Greg Alexander**

MARTHA WINGATE: Good morning. First of all I want to say thank you for including me today. I'm very humbled to be a part of this session to honor my friend and mentor and to represent the hundreds of students that Greg worked with over the course of his career. And I think that's the biggest piece of this that I'm just one of many and I'm very thankful to have been one of many.

So we're today to focus on Greg's legacy. He reflected on the past often and as Donna alluded to, he could tell a story like no other. But he was always looking ahead to the future, thinking about leadership and legacy. I think one of the most important things that Greg taught me was how much we are a part of something much bigger than ourselves in research, practice and most importantly in life. And that is legacy and it's our job to nurture that and move forward.

One of Greg's earliest contributions to the larger legacy of MCH was his work related to prenatal care. This topic was the focus of his dissertation work with Dr. Don Kornely at Hopkins. And I was talking to Donna last night and I thought I remembered this, but I did confirm that she and Greg traveled on their honeymoon through Europe and Greg talked about prenatal care and Donna talked about breastfeeding, so how much more of a legacy can you get than that.

And if you ever had him in class or had a conversation with him, prenatal care was one of his favorite examples. And I think Greg would tell you--would probably tell you that although his interest in prenatal care was genuine, his focus was constantly on the bigger picture, a healthier world for children and a place where children could thrive. And that was his focus on legacy.

So as a potential means to continue Greg's early contribution to MCH I'd like to present an initial analysis related to intensive prenatal care utilization. Greg and I had a very brief conversation about this topic last winter so it seemed fitting that this idea be included in this session. And I have to say Donna's discussion about Greg being able to take the data and flip it around in his head, there were a number of times when I was putting this together that I thought, oh goodness, if I could just have a little bit of that and just take it and piece it together. So this is a continuation of that conversation, of a very brief, maybe five minute conversation that I honestly wish I had taken better notes as we were talking.

As you can see, the title of this presentation is in the form of a question. And I struggled with this--the appropriateness of this given the little voice in my head that said it needs to be more precise, it needs to be more detailed, all those things we're taught to do, particularly when we're submitting manuscripts and other things to say, what is it that you're trying to say. But in the end I think it

occurred to me that as part of this tribute to our friend, a question to begin is the most appropriate.

Greg liked the questions and the search. And he liked seeing you squirm when he asked you the questions, in a very nice way, of course but he did like--he liked to press that getting the answer or what you think might be the answer, while important is not the main purpose of asking the question. I think he saw that it as more about the process particularly from a student's perspective to say where--how does this help them move forward and how does this help them in building their research skills, in building their legacy down the road.

So asking the question allows for pressing, pulling, debating, gnashing of teeth in some sense because you just can't answer anymore whys. And that last example is applicable to those of us who worked with Greg as students certainly. In addition, I think the information that I will present builds on work that Greg did with another former student, Kathy Taylor. She did her dissertation work with Greg a few years before I actually graduated. And this--I'll talk about how it builds on that in a few minutes, but again, this is all a part of Greg's legacy and hopefully a fitting tribute. Next slide please. Oh wonderful, thank you, that's even better.

I'd like to take just a brief to acknowledge a couple of people, Dr. Richard Shuchuk who is actually a professor at UAB helped me with the cluster analysis.

And to doctors Michael Kogan and Milton Kotelchuck who actually reviewed an earlier version of my presentation so I certainly want to say thank you to them and I know that they, particularly Michael and Milt did this definitely as a favor to Greg but I'm very appreciative as well. So thank you.

And ironically I should--for full disclosure; you have a pregnant woman coming to you talking about prenatal care which is kind of ironic because when we chose the topics that wasn't the case. So for irony's sake, for full disclosure. So I'm learning that prenatal care is one of the most widely used preventive health care services in the U.S., learning that firsthand. And it's used for identifying and managing factors that may contribute to adverse pregnancy outcomes. And the rate of adequate prenatal care and just to clarify, any data that you see right now is based on the revised GINDEX, which was Greg's prenatal care index. And I know that there are others as well and I certainly want to acknowledge those, particularly the Kotelchuck Index as well as others, but just to say for this presentation I've just focused on the GINDEX.

So looking at those data, the rate of adequate prenatal care changed from 30% to 41.1% from the mid 80s to the early 2000s and that was a 35% increase. And then in addition we saw an increase from 4.4% to 6.5% among the intensive prenatal care groups. So again we can also see--we can see that there has been a substantial--a change in those. And there's also been a change in maternal sociodemographic and medical characteristics among mothers in the United

States. Certainly we've seen an increase in multiple births, an increase in assisted reproductive technologies as well as an increase in age. But at the same time I think we've also seen some of those more traditional risk factors still come into play. So in each of the--the factors that I'm mentioning may result in a more aggressive management of pregnancy. So the question becomes who are the women receiving intensive prenatal care?

And the primary purpose of this investigation is to determine whether women receiving intensive prenatal care are a homogenous group of women or are they subgroups or clusters that are defined by maternal characteristics. And as I mentioned earlier, this builds on the work of Dr. Kathy Taylor and Greg as well as another one of Kathy's colleagues from Vanderbilt. They looked at the issue of clustering and women who received no prenatal care. So again paralleling that legacy piece certainly building into that. And we did a slightly different analysis that I'll get into in a second as well. So if there are different subgroups how does this relate to birth outcomes?

Now moving into the methods. We used the MCHS live birth infant death cohort files from 2000 to 2002 and selective U.S. resident mothers with intensive prenatal care utilization as measured by the R-GINDEX which I'm going to explain what that intensive is in this next slide. The R-GINDEX incorporates the month prenatal care began, the number of visits and the gestational age. And the intensive category actually includes women who had an excessively large

number of prenatal care visits, that is approximately one standard deviation beyond the mean recommended number of visits given their gestational age at delivery and the month prenatal care began.

What we did was we used a latent class cluster analysis which is a model based clustering approach to pull out who these women are, to say are they different, are they a homogenous group or are they truly a different group of women, are we more heterogeneous. And used the maternal sociodemographic and medical characteristics that are included on the vital statistics records as well as a focus on infant outcomes, including birth weight and gestational age. And just a brief mention of what the infant outcomes were, very low birth weight, moderately low birth weight, pre-term, et cetera, traditional--the ones that we see often.

So looking at the results we saw that four clusters were created and this showed four distinct subgroups within the intensive prenatal care category. And these clusters were compared to those women receiving adequate prenatal care and the overall population.

So again I've tried to highlight what the kind of key points are here. We can see that cluster one is predominately non-Hispanic white. They're a little bit older. I have to be careful with that 31.1--a little bit older, mind you. They're more likely to be married, 93.6% of them are married. They have higher education, over 15

years. And then you can see that the diabetes and the hypertension is actually higher.

And then there's two clusters of non-Hispanic black women. One is the--in cluster two the age is 26.6 which again is still slightly lower than what we see in the adequate and the overall category which you can see in the last two columns. And their other risk factors include--diabetes and hypertension, about 60% of them are married. And then in cluster three you've got the young non-Hispanic black women. And their age is 22.2. And you look at these risk categories, diabetes, hypertension and smoking. So again there's--showing the differences.

In cluster four, predominately Hispanic and I didn't include other in this category, but when you pull out the other race groups besides non-Hispanic white, non-Hispanic black and Hispanic, cluster four includes that large group, predominately foreign born, 82.4% and they're a little bit older--well on the older end of the spectrum of the 20s. Again, I have to be careful with that one I know. And they predominately live, or 21% live in an urban setting. So you can see the different clusters that have fallen out here that I just went through.

And now moving on to the birth outcomes, again we did the same thing. We wanted to look at the clusters of birth outcomes--or excuse me, birth outcomes by each of the clusters and you can see very low birth weight, moderately low birth weight, we've seen an increase compared to the adequate and the total

among clusters one, two and three. But then cluster four actually holds its own pretty well. When you look at those outcomes it's kind of an interesting pattern to see that post-term they're actually lower compared to the overall population.

There's some other interesting points that I point out a little bit more clearly in this slide. We've got higher rates of very low birth weight, moderately low weight, very pre-term and moderately pre-term among clusters one, two and three. And if you'll remember that's the white non-Hispanic and the two non-Hispanic black clusters. And then a higher rate of high birth rate among cluster one which was kind of interesting. Again, that's the non-Hispanic white group. And then higher rates of post-term among all clusters when compared to the adequate group.

So now moving into this discussion we can see that there are distinct subgroups of women who receive intensive prenatal care. And these subgroups vary predominately by race, age, maternal nativity and risk behaviors such as smoking. The rates of diabetes and hypertension are higher among all groups when compared--except for cluster four, hypertension is slightly higher but diabetes is actually lower when compared to the adequate care group and the total population. And we did see some cluster variations by--when looking at the outcomes. And the risks of some adverse outcomes are comparable to or lower than those among the adequate care group and the total population, which again is interesting to say what is it about these women. If they're babies are doing okay, what does that mean in terms of their being in this intensive care group.

So the limitations of the study include the secondary--include all of the issues with secondary data, certainly vital statistics are somewhat limited on maternal risk factors and behaviors, self-report issues including race and other demographic characteristics. And these preliminary analysis can certainly be expanded to include issues such as plurality, looking who are singletons, multiples, et cetera, hypertension certainly to parse out--right now all of the hypertension groups are chronic and pregnancy induced together, so certainly parsing that out, looking at c-section rates given all that we're seeing with that and then finally mortality outcomes.

And really getting back to that original question of does one size fit all for prenatal care and really what the original conversation that Greg and I had about this was to say should there be a new category. Is there something about these clusters that we see that should allow us to create an intensive plus group or something like that. And I think this was--for me this was the place that I needed to start to say okay, who are these women and then move on to say now what is their-- what is the number of prenatal care visits, the month prenatal care began to explore that potential for further categorization.

So that's really where this is headed, but again, preliminary I think starting with the smaller piece and then building is certainly important. And again, when measuring the quality of prenatal care which I know is in and of itself a huge

issue, which we can't get out really with these data, are there disparities between the clusters. And again, that's another piece of--I think you heard that on the video, Greg certainly focused on the disparities issue.

So my question is, is the system driving the intensive care or is it the maternal characteristics? And based on the preliminary analysis it seems that the answer may vary somewhat. When you compare cluster three and cluster four what does that really look like. And what are the practice implications related to these preliminary findings.

I've learned that Google is a very powerful tool. If you type in any symptom that you have as a pregnant woman, you can find absolutely anything that you possibly could have, which again is powerful but yet dangerous for those of us who are a bit on the hypochondriac side or on that side of things.

But I think there are certainly practice implications for that as well to say are women who are a little older and again I use that term very loosely--who are a little bit older and maybe more highly educated, are they asking for more care, are they really seeking that. So that's just a thought and certainly something to explore. Smoking and other risk behaviors you can certainly see in some of these places other areas for intervention and then preconception preventive care. So does one size fit all for intensive prenatal care. From the perspective of who the

woman is, no it doesn't. And then certainly I want to continue this discussion on further to look more deeply into this question.

So I have just another thing that I wanted to say just regarding Greg. You know I began working with him in 2000 as a student and then moved into a faculty position at UAB in 2005 which really allowed us to work together as colleagues although I think even before that--I don't know how he felt about it but I felt like he was--he treated me like one as well. And over that time, Greg, Donna, Morgan and Kerry became very good friends to my husband and to me. They were at our wedding. We are very fortunate to have a good friendship as well. So and as much as I'm here as a colleague and a former student I hop that I'm here as a friend as well and to represent a newer class of colleague I guess as I would be able to say.

And I wanted to close with this, just the idea of the mentor relationship because I know with the session that are going to be going on related to mentoring, somebody wrote this to me, I guess it was right around the time that Greg died and knew that--about the relationship that he and I had as the mentor/mentee. And they said it's a strange thing to describe, like a parent, like a friend, like a teacher, like a guardian all rolled up into one. And I think that sums up for those of us who are mentors and those of us who have been mentored that that's a part of that and certainly to continue on with that legacy. Thank you.