Racial and Ethnic Disparities in Women's Health Status

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Can you hear me in the back? Great. Thank you, Arden. I don't know what to do after such a fulsome introduction except to sit down because obviously nothing I say will equal what the buildup is. So I apologize for boring you, but I would like to recognize a mentor of mine, Dr. Naomi Morris. When I was a raw graduate student in Chapel Hill in 1969 Naomi was one of the very special people who took me under her wing. I started out in the graduate program in Maternal and Child Health and made a switch into Epidemiology and ended up with my PhD in Epidemiology, but my heart always stayed in MCH and it was in a large measure because of Naomi, and I'm just so impressed with the fruits of her endeavors here in Chicago and recruiting Arden and Joan and others, and you all have done a wonderful, wonderful job and continue to do a wonderful job, and my thanks to all of you for that.

I'm going to talk about something that people are talking about a lot now. A decade ago this was whispered, if it was talked about at all in--in the hallways. It was not a discussion point in a scientific session. And it is yet, I think, to be really accepted as good science, and with good reason, we don't have a lot of evidence yet. We're still in the hypothesis stage. In recent days though the question of why racial disparities rather than just describing racial disparities really has propelled this discussion into the forefront and to where we can take it apart, look at it dispassionately and say, "Okay, what needs to be done in order to test this adequately. To say, okay, it makes sense, therefore we've got to do something about it, or this doesn't hold up; therefore we need to look elsewhere.

What got me started was, Arden mentioned our linkage of birth and infant death records. Most of you are too young to know that 23 years ago there was no such thing as national linkage of birth and infant death records. There was one linkage back in 1960, and then in 1968 the birth certificate was changed considerably, including adding women's education to it, and there had not been a national database that had the opportunity to look at those data ever. And so when we decided we would do that with the 1980 *Birsco Board it was the first time that we had a large enough data set that we could then test what some of us called the poverty paradigm for the disparities in infant mortality between African-American and white babies that people could see because they could see it on the death certificates, but as far as looking into the risk factors their hands were tied because there were so few variables on the death certificates.

So one of the first things I did with this was to say, "Okay well let's control from maternal education. We should be able to see that as maternal education increases, infant mortality decreases, and I predict that that will explain at least part of the racial gap, because we know that African-American people are disadvantaged with respect to education."

And this is what we found. Yes, infant mortality did decrease with increasing maternal education, but the decrease in maternal education for--I'm going to try and use the pointer, but I'm not used to this computer so forgive me if I mess up here. Where's the pointer? There you are. You see here, the lower is the white and there--there's a pretty strong gradient from less than nine years of education to college education or greater.

For African-Americans there's also a gradient but the slope is not as great so that the difference here at the lowest infant mortality and the highest education is actually higher than the difference for the less than

nine years education. If anything, once you get to high school education there is a leveling off. But clearly there is a difference here that is not explained by maternal education.

We then went on, when the kind of crude linkage that we did with the 1980 birth code, where it was followed up with a much more in depth sophisticated linkage by NCHS beginning with the 1983 cohort, and we put three years together to look at other risk factors other then just education. And with that large a data set we could really focus in on women for whom the poverty paradigm with the least likely explanation for the difference, that is, college educated women whose partners were college educated. And among those women who gave birth over those three years the risk of infant death was almost two-fold, it was 1. 9 for African-American women whose partners, as well as they, were college educated.

So we then further controlled for early entry into prenatal care, which most of them had. Marital status, most of them were married. Parity, most of them were first and second born. But we could control for all those things, and that reduced the adjusted DOS ratio was reduced to 1. 8. In other words, just 10 percent of the difference was explained by the variables that were on the birth certificate. We looked at the reason for the deaths and that was predominately owing to immaturity and pre-maturity. And the risk for very low birth weight was three-fold for African-American women compared to white women who were college educated, who had college educated partners.

That lead us to the question, you know, what is causing this very low birth weight among well-educated African-American women? Go ahead 20 years and look at pregnancy related mortality ratios. Once again, education does affect maternal mortality, but there is a difference here by age and race. And that is not explained, really, by any kind of poverty ratios. Also, there's a crossover with marital status, which is really not well--I mean it doesn't think--explanations don't leap out at us.

What I've come to is a three-part breakdown of what I think we have to address in order to come to some understanding of these problems. We have to look at phenomena that cause the disparity, either in singularly or in combination.

And those phenomena have to occur more frequently among African-American than among white women. Now I'm focusing on African-American women because that's where most of the information is so far, but some of what I've had to say is certainly applicable to other persons of color in this country, to any racial or ethnic group that is identifiable and discriminated against because of the way they look. One would argue that the longer people of color have been in this country the more affected they are by that.

And thirdly, that the phenomena are not uniformly distributed, or their affects are not uniformly distributed among African-American women. The majority of African-American pregnant women are healthy and deliver healthy full-term infants. One of the early criticisms of the racism hypothesis was, "Well, everybody who's a person of color in this country is exposed to racism, so why doesn't--if that's an explanatory variable, why doesn't everyone have the same response?" Well obviously, there are other factors that intervene. Moreover, the assumption that everyone is exposed to the same levels of discrimination, I think, has long since been proven to be false. People are discriminated against differently and differentially, according to socio-economic status, how much exposure they have to the white population, to the majority population, and in different ways. And we'll look at that as we go along.

I'm going to use pre-term delivery as an example because that's what got me started in the first place, but I'll throw in some other data for other causes of morbidity and mortality for women, and I would hope that those of you who are interested in other things, or other causes of morbidity and mortality will think about how you might test these hypothesis, whether they have relevance to your areas.

So applying these criteria, first we have to know whether the hypothesis is a risk factor for pre-term delivery. Second, does that risk factor occur more frequently among African-American women of reproductive age? And third, what behaviors or genetic composition, or other things that distinguish one person from another, increase or decrease the frequency of the risk factor among African-American

women, or mitigate its affects in some but not all African-American women? Right now we have four kind of over-arching sets of risk factors that investigators are examining for causes of pre-term delivery.

Just backing up a step, my husband who's a law professor says that he cannot believe after eons of research that we don't know how babies are born. Well, that's the way it is, we don't. We don't know how full-term babies are born. You know, we don't know what causes parturition and we sure don't know what causes early parturition, so we're a little bit at a loss to then look at differential early parturition.

But we do have some working hypothesis, and one of the major ones for racial and ethnic disparities is stress, including the affect of racism. I'll talk about that first and then touch on some of the others, which are infection, diet and gene environment interactions. Even among the infection, diet and gene environment interactions there are levels of behavior to examine.

Clearly with stress one thinks of behavioral, individual, interpersonal and social-cultural exposures, but that also pertains to infection, diet and potential gene environment interactions. So the area of behaviors is a rich area for looking at causes and differential causes of pre-term delivery.

Focusing then on racism as a stressor, Camara Jones at CDC has published a very thoughtful piece in the American Journal of Epidemiology in which she calls on the research of others, as well as her own thoughts, to define three kinds of racism, which to a certain extent parallel the individual, interpersonal and social-cultural types here. The personally mediated racism is the interpersonal stressor. It is the acute stressor that includes individual insults and discriminatory acts. The institutionalized racism is the discriminatory race or class-based policies and practices, which are informal and formal, such a residential segregation, which has been beautifully summarized--its effects have been beautifully summarized by Shultz and Williams and their colleagues around Detroit. The same kind of set of studies is going on in Chicago but I'm not aware of the kind of copulation of research that Schultz and Williams have done for Chicago. And then internalized racism is the individual, and it's really the individual's response, it's the acceptance by the individual who resides within a stigmatized race of the negative messages about his or her own abilities and intrinsic worth. It's buying into the package.

Now let's go through each one of these and ask our questions. Is personally mediated racism a risk factor for ill health? Williams and colleagues recently published in the American Journal of Public Health reviewed 53 published population-based studies and noticed that 24 of these have been published since the year 2000. This illustrates the point that is kind of becoming an issue that is studyable. Of the 86 comparisons in these 53 studies 70 percent were positive for an association, 14 percent were positive within certain sub-groups, 17 percent had no statistical association and none was reverse associated. That is, that people who reported on individual experiences of discrimination were more healthy than when persons who reported no experience of discrimination. None of the studies indicated that. Perhaps not surprisingly, mental health was the most studied. And there were--of those there were 25 psychological distressed studies and 22 other mental health issues, and they were overwhelmingly associated with reported discrimination. For the physical health studies, of which there are fewer, self-rated health was the most frequently studied, blood pressure and cardiovascular disease and one on overall mortality, and then there were other studies that looked at kind of intermediate variables such as smoking and alcohol. Let's see. There were only two studies of pre-term delivery, and one of these was a positive study that was done here in Chicago by Collins and colleagues, and the other was one with no association. So we can't answer the question is personally mediated racism a risk factor for pre-term delivery, but it does seem to be a risk factor for ill health.

One of the studies by Shultz and colleagues shows that African-American and poor people report having unfair treatment on an everyday basis more than anyone else. And also on an acute basis, major things, like loosing a job, or not getting promoted. African-American and middle-class individuals also have a higher reported rated of everyday racism, as well as a much higher rate of reported acute racism or unfair treatment, than white and poor, or white and middle-class in Detroit.

I mentioned that personally mediated racism has not been well studied for pre-term delivery. This is the study by Collins, and it is a very small study. The data are too small to have a statistical association that is significant at the .05 level, but the trend certainly is in the direction of reported discrimination being associated with very low birth weight, which is what we found was the discriminating factor in the difference between well educated white and black women.

So to summarize this, personally mediated racism is not yet sufficiently studied. It is more frequent among African-American women. There's no question about that, but we don't know what behaviors increase or decrease the risk. We do suspect that social status doesn't protect against personally mediated racism. As a matter of fact there are some studies that suggest just the opposite, that as people get well educated and white collar jobs and move out in the community, they are more likely to experience personally mediated racism then individuals who stay in the ghetto.

Okay, so let's move to institutionalized racism, the thing that makes the ghetto in the first place. Is it a risk factor for racial and ethnic disparity in women's health? Well there's no question that poverty, which is in part a result of historical racism, is associated with poor health. There's also growing evidence that weathering, as defined by Arlene Geronimus at University of Michigan, or Allostatic Load as defined by McEwen, just the burden of living with something day in and day out, prematurely ages people and therefore prematurely causes ill health and early mortality. So we know that African-American women are more likely than white women to be poor and to be weathered.

There are health system behaviors that can mitigate institutional racism, either to reduce the impact of it, or to increase the impact of it. And I think that Ben Ryan and Fuse conceptual framework that was published in the American Journal of Public Health this year is a very good overview of how institutional racism can be affected, both positively and negatively, by the health institutions embedded in it. Here's an example of the weathering that Arlene Geronimus has studied. When women are 45 years of age, this is a study that was done in 1990 and it used cross sexual mortality data to project the proportion of women age 16 who would live to a particular age, and there isn't a whole lot of difference between white, black and Chicago Southside in mortality up to age 45. But you get to 65 and the overall black population has proportionally fewer have survived to age 65, and proportionally fewer of them who are living in the Chicago Southside have survived to age 65. Then to get to 85, you still have 40 percent of white women, but only 30 percent of black women, and barely more than 20 percent of black women in living in the Chicago Southside. What she concludes from this is that whatever it is that is affecting racial and ethnic disparities in health is cumulative, and that it needn't happen, because if people were able to avoid being weathered they too would be surviving to these older ages.

This is hypothetical. We don't have good measures yet of premature aging, of allostatic load, of weathering, et cetera. It makes a lot of sense, but it needs to be defined, and it needs to be studied independently of these environmental studies, these ecological studies. Well, socio-economic status is one of those things that weathers us. If we're poor, we don't have access to resources when crisis occur. We may not even recognize the resources that we have, if we are living in neighborhoods that are residentially segregated those resources might not be there even if we could afford them. But in general, poor people are more likely to be weathered over time.

What I have looked at with this--with the study by Howard and Associates, using data from the National Longitudinal and Mortality Study, is how little the racial gap is explained when SES is adjusted for. This is a good study to look at SES adjustment, because it's at the individual level, it's income--I believe there's a measure of wealth as well, so it's a good study from the perspective that most things like birth certificates don' have income, they're just education. So this one is better for thinking about testing whether SES, whether the poverty paradigm does explain very much.

And the unadjusted hazards of dying, for black versus white women, from 1979 to 1985 is 2.5 for infections. The SES adjusted has its ratio is 2.3. Not much difference. Stomach cancer: 2.2 versus 2.1. Diabetes: 2.1 versus 1.7, a little bit more, but still there's a huge amount of the disparity that's not explained controlling for SES. High blood pressure among people 55 to 74: 4.9 to 4.2. Now there are a

few diseases that do not change. Ischemic heart disease: 1.7 goes actually up to 1.8 for people 35 to 54 years old, and for the elderly it's unchanged.

So what this says, I think, is that we have more to look for. SES clearly is a problem. What we can do about SES is perhaps limit it from the health perspective, but there's plenty more that we need to look at for the potential for intervention.

Well I'm going to move quickly then into internalized racism, and ask the same questions. It has been associated with some ill health indicators. A very interesting study by Tull, who is at the University of Pittsburgh, and Associates, in Afro-Caribbean women in Barbados suggested that obesity and a high waist to hip ratio, which is the most risky kind of obesity, as well as high blood pressure, were associated with internalized racism among Afro-Caribbean women in Barbados, and that this was not explained by age or by education. There was still about a two-fold excess risk of obesity and abdominal obesity owing to, or associated with, internalized racism.

LaVeist and colleagues have looked at the external blame for things that have gone wrong, or for discrimination versus internal blame. In the national survey of black Americans from 1979 to 1992 this study is important in that whether they said that they had been exposed to racism, and whether they blamed the system for that or blamed themselves for that, was all measured in 1979. And then they were followed until 1992 for survival. Those people who reported that they had been exposed to racism, and who blamed the system for that exposure, were far more likely to survive than any of the other groups including those who said, "No, I haven't been exposed to racism. What's racism?" and those who said, "Yeah, I've been exposed, but it's basically my fault." So what they carry away with this is that reporting experiences of discrimination may and in of itself be a measure of internalized racism; if people do not report in a survey that they have been exposed it's possible that they haven't been exposed, but it's also possible that somehow they they're in denial; and that those who do report exposure and say, "but it's not my fault" are the most likely to stay alive. Well, it clearly meets the criteria of race specificity and there is some evidence that personality traits, not necessarily personality traits associated with internalized racism although I think they are, experience--interact with experience to mitigate the impact of internalized racism, but there's a lot of work that needs to be done in this area.

Now why would we be focusing on the stress hypothesis for pre-term delivery? I think the stress hypothesis is a good one, it may not be the only one, but it also is one that incorporates infections and a variety of other ill factors associated with pre-term delivery, so it's kind of an over arching explanation of pre-term delivery. It also is an over arching explanation for hypertension, for diabetes, for coronary heart disease, and if you'll look at the ratio disparities by how much of that particular illness or morbidity is hypothesized to be associated with stress there's a very strong correlation. That is, disparities are greater for illnesses that are associated with stress.

So I think stress works as an over arching hypothesis for the cause of at least some racial and ethnic disparities. Some individuals react differently to stress than others do, and there's a growing body of literature on stress reactivity. Now I cannot tell you how much I'm stressed right now by speaking to you, and by speaking to you about this very sensitive topic, but my hands are sweating, so my body is telling me that I'm pretty darned stressed out. And I have stress reactivity to public speaking. And a lot of people do. There are measures of stress reactivity, galvanic skin response is one, elevated blood pressure is another, and we have experimental studies in which various things have been looked at like chronic hypertension or acute rise in blood pressure around racial slurs for both whites and blacks.

And then we've looked at--I haven't done--Evans has actually done a wonderful job of putting the literature together around cardiovascular disease, poor health outcomes and the psycho-social stress of experienced discrimination, and he doesn't limit his analysis to racial discrimination. As a matter of fact, one of the fascinating experiments that he reports is of white men executives who are placed in an experimental situation in which they're not in charge. Blood pressure rises in experimental settings. And it's very interesting in the primate literature in this about dominant males and what happens to them when they lose their dominance and the whole thing.

This is a book called, "Why are Some People Healthy and Others Not?" and I recommend that book to you; it's a fascinating read and it does summarize a lot of the animal, as well as the laboratory and epidemiological evidence that stress really does make a difference in cardiovascular health, including blood pressures. Well, blood pressure does rise in experimental settings, it is not associated familial hypertension which suggests that it's not a necessarily a genetic thing but rather something that the differential stress reactivity may be environmentally induced, and in fact the developmental psychologists--are there developmental psychologists here? Please correct me if I'm wrong, but from what I read, stress reactivity is set by the age of two or three, that the neural--that stress early on apparently reduces the number of neural pathways that are available, and it also sets a baseline for cortisol. I'm sure that there are things that may happen later on in life that may affect stress reactivity too, but what that says to me is that A) if there are individuals who are more reactivity to the stresses in life, including the stresses associated with racism, and
B) if that reactivity is set in the fetal environment or the early developmental environment then
C) we've got to get intervening into mother/infant, parent/infant environment, daycare infant settings that will protect the little ones so that they will come out of that period of time more intact and more able to deal with the insults that occur later on in life.

Now, I think I have time to give you a little vignette about this, my daughter who is now fifteen and a half, driving me crazy, talk about stress, is Chilean, we adopted her when she almost seven months old and she came to live with us in Atlanta in a neighborhood that is racially integrated. She's *morena*, she--you can look at her and say, "This is a Latino American child," a beautiful, beautiful girl. And when she was about two and a half, when she was in a daycare down the street, and she started talking about white people and dark people, and I talked with a friend of mine who's white who's married to a black man and living in D. C. and I said, "Help me teach her what I need to teach her." And she said, "I think she may be dealing with some of her own issues."
"Nah, unh-unh, nah, couldn't be. This is a liberal neighborhood. No, no, no, no."
And she said, "Well, just watch." So I happened to be lucky to have a nanny who worked at the daycare center and came home, it was like a half-day program, and she brought our daughter home in the afternoon, so I said, "Fiona, here's the deal. Watch her [inaudible]." She said, "Oh no, Carol, it couldn't be." I said, "Yeah, I know, but just watch." The very next day, I kid you not, the very next day, she says, "Okay Carol, you're right."

This was in the summertime everybody was exposed to the sun. Okay? They're walking down the stairway inside the church to go outside to the playground and she points to this boy walking down the side area and she says, "You're brown and I'm brown." And he says, "No. I'm white and you're brown." And Fiona said, "There's not any difference in their skin color right now. They're all tan." And they walk out the door and she points to a man working on the church, and she says, "You're brown and I'm brown." And he says, "No. I'm African-American and you're Latin American." She said, "At this point Elizabeth's eyes crossed."

Now I tell you that because it was a life changer for me, I realized that a lot--we cannot protect our children from this kind of--it's distinction, if it's not discrimination, and so they're learning at a very young age. And what we have to do, basically, is protect them as much as we can, I think, but realize that we can't protect them entirely.

Okay, so the--I would challenge you that stress covers infection and maybe diet, and maybe gene environment interactions as well. Sexually transmitted diseases, douching, the partner's roll, all of these have differential exposures related to racial residential segregation, access to health care issues, cultural attitudes. The--looking at sexuality as an example, there's a community load of sexually transmitted diseases, there's a male/female role affect of being able to negotiate around sexual activity and around condom use. There are fewer alternatives to child/adult transition than child bearing. There is, I think, an intervenable effect of the availability and acceptability of contraception, and also there may be an intervenable effect of our--of pregnancy wantedness. All of this translates then to bacterial vaginosis, which is a risk factor, apparently, for pre-term delivery, and for looking at individual and community level

stressors, does seem to reduce the black/white difference in the study of--that Jennifer Culhain is--ongoing study in Philadelphia, but it doesn't explain the whole thing.

Well, I put this thing in, and you've got it in your handout, it may be too small to read, but this is from Long and Associates and it was published in Pediatric and Perinatal Epidemiology Supplement in 2001, and it is kind of an overall graph of how stress is a unifying framework for pre-term delivery. The maternal/placental fetal neural endocrine patho-physiology, it took me ten years to learn how to say all that, of largely unknown origin and maternal/placental fetal infections, and related immune patho-physiology are the current leading candidates for etiologic investigation. Maternal stress, both prenatal and pre-conception, are plausible causal factors in producing increased endocrine and/or immune patho-physiology during gestation. It might even explain the differential in bacterial vaginosis.

Okay, so how do we put all of this together? As an epidemiologist, I like to think about the agent/host environment unifying epidemiologic framework as a theoretical jumping off place for looking at these issues. If our agent is racism then it has to enter the host, or impact the environment to increase the host's susceptibility in some way. Racism doesn't automatically affect health; it has to affect health through the environment or through setting up the host in some way.

So, one of the ways that I think that that happens is that institutionalized racism primarily affects the environment through residential segregation, through reduced job opportunities, even within a community, to increase weathering for the individual. I think that's the impact.

Then the inter-individual experiences of racism directly affect the host, they challenge the host. If you will, that's the infectious agent. Right? It's the viral load that is spat onto the person through the insult that the person receives.

How that person responds is then affected by his or her stress reactivity, as well as personality traits. Some people keep their anger in, others express their anger, some people are naturally more anxious than others, and some people chose to deal with their stresses by healthy kinds of things, going out and running it off, and others chose to drink or to smoke. So those are behavior risk factors that are responses to these, both environmental and individual experiences.

And then there are positive things that people do that may make them more immune to any kind of insults, including perhaps, levels of spirituality. Most studies of psychological well-being end up being surprised at how psychologically positive that mean--the level of depression is always lower among African-American adults then is anticipated. And most studies that look at this, and that also control for spirituality, explain that through religious beliefs of the culture of that. Others also look at ethnic identity as an immunizing factor. So there are ways to immunize the host, if you will, to reduce--to increase, not the stress reactivity, but to reduce the perceived level of stress.

We don't know about gene environment interactions, but I suspect we'll find out. I think they're now some studies that are looking at allele frequencies for genes that associated with a cortical releasing hormone, for example. And then if the person has internalized this they are at greater risk of illness as associated with this agent.

So let me summarize. If the maternal stress framework provides an accurate framework for the causes of pre-term delivery, and other health causes, then the affects of the stresses associated with being a member of a minority group may explain much of the excess pre-term delivery risk, much of the excess cardiovascular risk, much of the excess hypertension risk. Perhaps even the excess breast cancer incident risk among well educated women for African-Americans.

So what do we need to do about that? Assuming, let's look ahead past the very interesting academic exercise and say, well, if--let's test this, assuming that we're correct what would we do about it. Well clearly we have to back up one step and do more research. There's too many ifs ands and buts to this talk. But, I think there are other things that we can do now. We can identify and root out personally

mediated racism in healthcare settings. The Institute of Medicine study last year painted a very, very clear picture of medical care setting discrimination. We don't need that. That's something that's within our control; we can get rid of that.

We can vaccinate individuals against stress. I've already talked about some hypothetical ways of doing that. I would love to get rid of racism. You know, we move into the bright new world of the future with nobody saying it's us and them. That may be an imbedded characteristic of people; we may have to describe otherness, it may not have to be as toxic as the way we describe otherness in this country, but it may be a little bit like cholera. We can't get rid of cholera. Cholera rides around in our gut. We can get rid of infection associated with cholera because we can control the environment when you have clean water. There are few diseases we actually have been able to get rid of, but most of the diseases that are transmitted, infectious diseases that are transmitted by air or water are ones that we have been able to vaccinate people against and therefore keep them safe. So I think in the interim, at least, we need to think about ways to learn to vaccinate discriminated groups, and that would go across the board to whatever discriminated group we're talking about, against the effects of the discrimination. That doesn't excuse the discrimination, but it really says right now what can we do while we're waiting for the brave new world.

And then we can also, I think, improve social supports for women, infant and children in poverty, including improved family planning, to affect the environment for reducing stress levels for the little ones. I'm not going to go into this because we really don't have time, but maybe in the question and answer period we can discuss it if you'd like to, and likewise recommendations for research. You have those in your handout and I want to allow some time for questions after Ellen talks about what she's going to talk about. So, I'll end there and I thank you very much for the opportunity of coming here.