

MCH EPI Conference

Plenary I –The Life Course Perspective:

Moving from Theory to Action

December 9 – 11, 2009

MICHAEL C. LU: Okay. So good afternoon. My name is Michael Lu. I am an associate professor of obstetrics, gynecology and public health at UCLA, and it's my great honor to serve as the moderator for this very distinguished panel this afternoon.

We're going to be talking about the life course perspective, moving from theory to action. And the emphasis here is really about action. We're going to be talking about how to apply the life course perspective to guide research, practice, and policy at MCH. We want to ask you to consider what role MCH EPI can play in moving the life course perspective from theory to action.

So I was asked to provide a brief summary of the life course perspective. Then I'm going to introduce each of our three speakers this afternoon.

So simply stated, the life course perspective is a way of looking at life not as disconnected stages but as an integrated continuum. It's a conceptual framework. Some people might even talk it a paradigm shift that recognizes that

each stage of life is influenced by all the life stages that preceded it and in turn influence all the life stages that follow.

Now, I think this is especially important for us to recognize in Maternal Child Health for one life stage is often disconnected from the rest. So for example, in perinatal health we focus so much on those nine months pregnancy, that we often forget that there are a great deal of life course influences on perinatal outcomes and a great deal of perinatal influences on life course outcomes.

An example would be in trying to explain this black-white gap in burth outcomes, for that case we search for risk factors during those nine months pregnancy rather than looking at the women's accumulate active life course experiences exposures. I think the danger of looking at solely pregnancy related risk factors that only do they not explain the disparities very well, they can actually misguide public health programs and policies.

For two decades we thought that if we could get women into operate prenatal care then we can really do something about closing the gap. Today many of us are beginning to recognize that to expect prenatal care in less than nine months to reverse all the cumulative disadvantages and inequities that's accumulated over the life course of women is probably expecting too much of prenatal care and that if we're serious in this nation about closing this gap, we got to start taking care of women and families not only during pregnancy but before

pregnancy, between pregnancies, beyond pregnancy and across their entire life-course.

Now, the life course perspective has two major components. The developmental programming component and a cumulative pathways component. I'm going to briefly describe each one of these.

Now, the developmental programming model posits that experiences early in life, including those when you were just a baby inside your mother's womb, these early life experiences can influence your health and function for life. I'm not going to say a whole lot about developmental programming because Dr. Barker has already did this morning. And I have to say that this is the third time this year that I've been asked to speak in a conference after Dr. Barker and it just doesn't get any easier. [Laughter].

For me to be talking about developmental programming after Dr. Barker has already spoken I think it's the equivalent of me trying to explain to you all about the 10 Commandments after Moses has already spoken. [Laughter].

So by the way, that's Dr. Barker on your right. But I will give you an example which demonstrates why his message is so important to our work in Maternal Child Health. And that's the whole idea of prenatal programming of childhood obesity.

Now, you all know that there's an epidemic of childhood obesity that's going on in this country. Over the last 30 years the rate of childhood overweight has more than doubled for white kids and more than tripled for black kids. So a few years ago my students and I were interested in this whole notion of prenatal programming childhood overweight and obesity, so we did a systematic review of the literature looking for prenatal factors that's been linked to childhood obesity. And we found at least four. Too much weight gain during pregnancy, diabetes during pregnancy, poor nutrition -- and by that I don't mean just under nutrition, but poor nutrition during pregnancy, smoking during pregnancy. In fact, if your mom smoked during pregnancy, you have a twofold increase for being overweight or obese as a teenager controlling for a whole bunch of different confounding factors.

We're beginning to map out the biological pathways mediating these epidemiological associations. So for example, in the case of diabetes during pregnancy, let's say your mom had diabetes when she was pregnant with you, and let's say her diabetes was poorly controlled. But we know that all that excess blood sugar, all that extra glucose crosses the placenta and causes the baby to produce a lot of insulin in response to that excess glucose. And all that excess fetal hyperinsulinemia during critical periods of development basically does three things.

Number one, it lays down a lot of fat cells. Number two, it causes a program insulin resistance. And number three, it causes a program leptin resistance. Now, you all know about insulin resistance, but what does leptin resistance do? What's leptin? It's basically a satiety hormone, right, it tells you to stop eating when you're full. So if you have leptin resistance in the brain, what are you going to do? You're going to keep on eating. Leptin also tells your pancreas to stop producing insulin, so if you get a leptin resistance in the pancreas, you're going to keep on producing insulin, it's going to lay down more fat.

So by the time that baby's born, she's already born predisposed to life long struggles with overweight and obesity. And then you add on top of that a fast food nation that super sizes everything and that may be partly driving this whole epidemic childhood obesity and early onset type 2 diabetes that we see in this country.

So if we want to prevent childhood obesity in this country, what do you have to do? It's probably not enough to just talk about school interest and physical activities, right? Not that those aren't important. By the time that baby's born you'll have lost half the battle already. So if we really want to prevent childhood obesity, we've got to start taking care of mom not -- we've got to do it much earlier by taking care of mom during pregnancy, make sure that she doesn't gain too much weight, make sure she's fed good nutrition, she doesn't smoke and that her diabetes is under control.

The second component of the life course perspective has to do with accumulative pathways. And this is really a risk accumulation model. It talks about the accumulation of insults and injuries to your biological systems which causes a decline in health and function over time.

Now, let me give you an example from the stress literature. What happens when you're under stress? What happens when you see a sabertooth tiger? You run, right? And you run because your body activate that whole flight or fight response, the hyper point pituitary adrenal [Inaudible] and some pathway adrenal medullary system you put all of those stress hormones to help you run away from the tiger.

But what happens after you got away? You relax, right? Your blood pressure comes down, your pulse comes down and you relax. Right? And that's the amazing thing about the human body. It's self regulating and knows to shut itself off once the stressor has been removed. And that's what we call allostasis, which means to maintain stability through change.

Allostasis works largely by a negative feedback mechanism which is very common to many biological systems. It works very much like a thermostat. So let's say the temperature in this room falls below a preset point. What happens? Well, the thermostat kicks in the heat. And as soon as that preset point is reached, the heat turns off the thermostat to prevents this room from

overheating. So the same thing happens inside your body when you're under stress your brain activating HP axis to produce cortisol, cortisol in turn feeds back negatively on the brain to shut off the HP axis to keep your stress response in check. So that's allostasis of work, maintaining stability through change.

Now, allostasis works well for stress you can either fight off or run away from. But what happens there's nowhere to run? What happens if you can't get away? You get eaten, right. But if you don't get eaten, what happens? In the face of chronic and repeated stress, your body loses that ability for self regulation, so now you can turn on but you can't shut it off. Biologically speaking what may be happening is you get this tonically elevated level of cortisol to downregulate glucoreceptors inside your brain and so you lose that negative feedback and we find in animals and humans subjected to chronic and repeated stressors that they actually walk around with high [Inaudible] level stress point nodes.

If you were to subject them to some natural or experimental stressors that they would actually put out a lot more stress hormones than other people would if they were to be pregnant at the time that could potentially precipitate preterm labor. And that's when you start to go from being stressed to being stressed out. Okay? And there is actually a big, big difference here. It's a difference between protection and damage. Okay?

When you're stressed, your body activate a sympathetic response to increase your cardiac output to help you run away from the tiger. Okay. But when you're stressed out, you can't shut off that sympathetic response and that chronic, uncontrolled sympathetic activation over time can lead to hypertension and cardiovascular diseases.

When you're under stress, your body activate the HP axis to produce cortisol and cortisol is a glucocorticoid and one of the main functions of glucocorticoid actually converts your body's store energy into glucose which become readily available fuel to help you run away from tiger. Okay. And this step partly by impeding insulin action. But again, when you are stressed out, you can't shut off that HP axis, and that chronic, uncontrolled, all that excess glucocorticoid over time can lead to glucose intolerance and insulin resistance.

Under acute stress your immune functions actually work better, but under chronic stress you become a lot more susceptible to infection and inflammation.

And finally under acute stress you actually get growth neurons inside the hippocampus and the parietal cortex. These are learning centers inside your brain. And it's why most of you could probably still remember exactly what you were doing when you heard about 9/11 and some of you could probably still remember vividly what you were doing when you heard that JFK was shot or when Dr. King was shot, right?

But under chronic stress the exact opposite happens. So rather than growth, you get atrophy and death neurons inside these learning centers in the brain, and that's why women who are under chronic stress begin to report that they're becoming more forgetful, that they're losing their memory.

And I think Bruce McCune at Rochester University provide perhaps the best illustration of these concepts of allostasis and allostatic load in this cartoon here. The bottom image here. This is a picture of allostasis. Okay. Two kids balancing on seesaw, maintaining stability through change.

But what if I were to replace these two five kilogram kids with these two 500 kilogram sumo wrestlers? You put so much stress on the seesaw that sooner or later that seesaw's going to break. Okay? What if a woman were to enter pregnancy carrying those two 500 kilogram sumo wrestlers on her back? She's not going to have a very good pregnancy, is she?

Recently served on the Institute of Medicine committee on understand prematurity. And during committee meetings we had some discussion about the need to rethink the causes and prevention of preterm birth in this country. Okay? And we know this is a big problem because preterm birth is a leading cause of infant mortality and childhood disabilities in this country. It is also the leading cause of racial ethics disparities in infant mortality in this country. An

African-American baby born today is about one and a half times likely to be born preterm, about two and a half times as likely to be born very preterm and this two and a half full difference in very preterm birth accounts for about two-thirds of all axis black infant deaths in this country.

So if we could figure out how to prevent preterm birth then we could really do something about reducing infant mortality and closing the disgraceful gap in infant mortality in our country.

So during committee meetings we discussed that the need to rethink the causes and reinvention of preterm birth in this country, and that's because we used to think that preterm birth was for consequences some precipitating event like a stressful life event or infection that occur around the time of the onset labor. But we now think that the origin of preterm birth actually occurs much, much earlier than that, and that your vulnerability to preterm delivery may be traced not only to exposure to stress and infection during pregnancy but to your host response to stress and infection and that's the stressor activity inflammatory dysregulation that's been patterned over your entire life course by these early programming and cumulative [Inaudible] that I've been talking about.

So if we really want to prevent preterm birth in this country, what do you have to do? The message is clear. We've got to take care of women not only during those nine months of pregnancy, not only during prenatal care, but you got to

start much earlier than that, okay. And an important objective, preconception care has to be to store -- restore allostasis and optimize women's health before they get pregnant.

And just one last slide. Just in case you think I'm talking about the baby, okay, I'm not. Because the same allostatic load that causes that stress reactivity inflammatory dysregulation that causes poor pregnancy outcomes will continue to wreak havoc for -- in mom's blood vessels and vital organs to cause chronic diseases later on. And so in this study, it was found that women who had a preterm birth were significantly more likely to either get hospitalized or die from a heart attack over the next 15, 20 years compared to women who never had a preterm birth.

Studies like these that are beginning to reframe the whole issue of preterm birth from simply a children's health issue to women's health issue. That preterm birth may be a sign of things to come that help the development of chronic diseases later on in life.

So it's with distinct pleasure that I'm going to introduce our next three speakers. Dr. Wilcox heads up the reproductive epidemiology group in the National Institute of Environmental Health Sciences. He served 20 years in the US public health service and 10 years as epidemiology branch chief.

He is also the editor in chief of the Journal of epidemiology. And Dr. Wilcox is going to be talking about in utero exposures and talking about some of the limitation with these longitudinal analyses and he will give example of some of these exposures and what we need to be going forward in terms of research.

And then we're going to switch gear a little bit to talk about how to translate theory to practice on the ground. And Mr. Mario Drummond is the CEO of the northern Manhattan parallel partnership Harlem based Healthy Start program. I think he's done some really amazing things in Harlem in terms of transforming that Healthy Start project into what he call MCH life course organization. So we're going to be hearing from him about that program.

And finally we have Dr. Mill Kotelchuck. And many of you know Dr. Kotelchuck well. He's a professor and chair emeritus at Boston University School of Public Health. And he is kind of widely known for developing the adequacy of prenatal care utilization index or most us of just call it the Kotelchuck index. He is also the founding editor of Maternal Child Health Journal and I would say he is very much responsible for that -- for developing the -- the development of the ideas in the paper that Dr. Halfon and I wrote in 2003 about the racial and ethnic disparities and birth outcomes from a perspective.

Dr. Kotelchuck in the year 2000 was the recipient of the first MCH epidemiology award for advancing knowledge.

So without further ado, let me bring up Dr. Wilcox to talk to you about the life-course.

[Applause].

ALLEN JAMES WILCOX: Thank you, Michael. I'm very pleased to be invited to speak on this panel. I only regret that I wasn't able to bring my voice with me. I hope to make it through 25 minutes here. Two days ago I had no voice at all.

My goal is to build some bridges between the nutrition hypotheses that David Barker discussed this morning and consider broader spectrum of prenatal factors that may have lifetime consequences and then to consider what some of the difficulties are of actually implementing those ideas in real life.

So my outline is first to say a few words about Barker's hypothesis and his observations about birth weight, to talk about other fetal exposures and adult health.

So the fetal exposures I'll talk about are carcinogens across the placenta and some other things. And Michael, I'm going to do this myself. No. [Laughter]. And then the challenges for public health. So let's move right along. [Laughter].

David Barker, the springboard for all of David's work has been this association between birth weight and cardiovascular risk. And I'll just show you one more piece of data. This is something published just a few years ago or last year. Looking at death to cardiovascular disease by birth weight in a large cohort of Danes. And interesting thing here is not just that the -- nothing works for me today. There it is. Not just that the risk goes down with higher birth weight, but then there's this little hook at the end where the risk actually increases for the very largest weights. And that's something that David has explained. On the other hand, none of the rest of us know what that means either. But it's a very pervasive pattern. So just keep that in your head.

So Barker has focused on nutrition and the effects of nutrition on metabolism in cardiovascular disease. Twenty years ago when David was talking about nutrition, he meant birth weight and now he's acknowledged that nutrition really doesn't have that much to do with birth weight, at least mother's nutrition, and so we've got to look a little bit more broadly at the mother's nutrition over her lifetime. That's fine. I think there's been some very constructive ideas to come from this hypothesis. Let me note this is a hypothesis.

So let me expand your thinking a little bit here. Birth weight is not just related to cardiovascular disease in adulthood, it's related to a lot of things. So here are data from the same Danish cohort that I just showed you a picture from. And this is a pretty common picture, not just for breast cancer as David discussed briefly

this morning if I were at the discussion, but for cancer mortality in general. Also for childhood mortality. Pretty interesting. But even more interesting than that, I think, is when we look at mortality from all causes other than cardiovascular disease or breast cancer or cancer at all. We see the same pattern.

So this includes everything, neurologic disease, suicides, infections. And we see the same pattern of the most vulnerable being the smallest and this little increase at the end.

So it doesn't end there. Birth weight is also a strong predictor of morbidity in adulthood and some pretty serious morbidity. The next few slides come from examinations of military recruits in countries where there's universal conscription. And so in Denmark they found that birth weight was associated with the risk of having a hearing impairment among young men who came in for their physical. And in Sweden birth weight was related to the risk of schizophrenia during the time the men were in the military.

So what we have here, we have a very pervasive set of associations between birth weight and adult health that isn't easily explained in my mind at least by a simple hypothesis. It's possible that fetal nutrition in some sense however we want to define that affects more aspects of health than we realize. We don't know. That's possible. It's also possible that there are some confounding factors that we haven't yet measured or are only beginning to understand.

Examples might be genetic variability, might be fetal exposures that link fetal growth and adult health. And by linking them, I'm talking about this very specific concept of confounding an epidemiology to say that there's -- there may be factors that make babies smaller but that's just a sign of the presence of some other condition that is also going to affect that baby's health later in life. So it's not through birth weight but birth weight is a marker.

So with that segue, let's think about fetal exposures that might have some effect on adult health. And I'm going to start with a story of diethylstilbestrol. And I first want to ask you to raise your hand if you know what DES is. Okay. A bunch of you but not everybody. It's interesting to me that this is becoming an old story, kind of, you know, old hat now. Except it's not a story that has ended, as you'll see.

On so DES was the first synthetic estrogen, something you could take orally and created a great stir in the medical community when it was introduced because it seemed like it might have all kind of good uses. One of the uses that was suggested was to prevent miscarriage. And within a short time that morphed into the idea that DES improved fetal health. This is an advertisement from the American Journal of Obstetrics and gynecology in 1956. And you probably can't read the small print if you're reading in the back, but let me just read it to you.

This is recommended for all pregnancies. Leads to bigger and stronger babies too. What it actually led to was a pretty retched kind of cancer in the young female fetuses who were exposed. This story unfolded in 1971 when first one teenager came to a Harvard hospital with a kind of vaginal cancer that before that had only been seen in very elderly women. And then another young woman and soon there were six or seven. And the physicians caring for these young women knew that something unusual was going on. And it was one of the young women's mothers who asked the question whether this might be related to DES which she had taken in her pregnancy with this young woman. And in fact, that was the cause.

The drug was immediately banned by the FDA. And there have been an estimated 500 young women in this country who have had vaginal cancer attributable to DES. So the drug was banned, nobody uses it anymore. Nothing to worry about. This observation of a drug that could produce cancer in adults among supposedly healthy newborns spurred a lot of research in the laboratory on substances that might do the same. And for a while there was a concern that there may be many cancers that are being produced in this way by this route. And in animals that's true. There are many.

This is an example -- this is a summary paper that summarizes lots of different cancers that can be produced in animals by exposure of the fetus. In humans we have not found another example of a cancer that's caused by prenatal exposure.

It's interesting that as time goes by we discover that vaginal cancer is not the only cancer that DES causes. Part of the difficulty with even studying this is knowing who was exposed to DES. There are a few cohorts of women who have been identified in this country and who are being followed.

It looked for a while like there might be an increased risk of breast cancer with DES exposure. But of course the women were relatively young, so they were discontinued to be followed until finally in 2006 the difference became statistically significant. So now we're seeing an emerging quite dramatic risk of breast cancer among women who were prenatally exposed. This is a risk that's emerging 60 years later. This is really depressing for epidemiologists.

And as these -- this cohort which was born largely in the 1940s and 1950s, as they age, we can only observe so see what cancers they might have. But the interesting story and the reason I brought this up is not because of cancer, it's because of just what we've been talking about today, maternal and child health. It turns out that women who were exposed to DES in utero have much higher risk for a whole series of problems related to their own reproduction. They are more infertile by two to four fold. They have up to a doubling of their risk of miscarriage. They have more tubal pregnancies. And they have up to three times the rate of preterm delivery.

This leads to some only estimatable levels of morbidity and mortality because we don't know exactly how many women were exposed in the US. We think four million is a probably pretty media figure. Estimating from the cohorts that we do identify, there are probably 100,000 women in this country who are infertile because of their prenatal exposure, which they may not even know that they had. There are probably 300,000 babies born preterm due to DES. And we can estimate that that has led to about 10,000 neonatal deaths. And among the babies who survived, maybe another 10,000 with cerebral palsy and other kinds of developmental problems related to preterm.

Contrast this with the 500 cases of vaginal cancer that we started with. So now we come to the really disturbing part of this story. What if DES had not caused vaginal cancer? Number one, it would not have been banned in 1971, and more people would have been exposed. You might think, well, they would stop using it eventually. There was a randomized clinical trial done in 1951 that showed that DES did not improve pregnancy outcome. It was published in the American Journal of Obstetrics and Gynecology, the same journal that published that advertisement five years later.

The second disturbing question is if DES was still being used today, would we have noticed an increased risk of infertility or preterm births among some women? It was never widely used. Four million is a lot of women. But that's at most two percent of the women who were born during that period. So if we have

two percent of the population carrying this enormous risk and we don't know which two percent it is, would we notice?

What if we had noticed? Would we ever have thought to ask the question of their exposures 20 or 30 years later? And what if we had thought of that question? Would women know? What other aspects of adult health might be affected by fetal exposure. Given the phenomenon of DES there has been other research done on maternal -- on prenatal exposures and adult outcomes. Thank God for maternal smoking. What would epidemiologists do without it? [Laughter].

There have been studies reporting effects on young men exposed to their mother's smoking in pregnancy with decreased sperm quantity and increased infertility, and also reports of female infertility. These are not great studies. They can't distinguish between passive exposure in childhood and prenatal exposure but the data are there, and they need to be investigated.

What other things? This is a really interesting paper done by economists of all people looking at the 1918 flu epidemic which as you may recall was highly intense wave of infection that went through this country over a few months. And so what these investigators did was to look at people who were in utero according to the date of birth during the height of the influenza epidemic and compared them to the people who were born just before and just after.

And the data are pretty remarkable. Fetal exposure is associated with increased probability of collecting disability, of lower achieved education, and increased risk of diabetes and stroke.

So the challenges for public health. I have three in kind of reverse order of importance, methods, data, and hypotheses. First methods. If you're an epidemiologist who is kind of a geek, you know that there's some really cool stuff that's going on with the development of new methods for analyzing longitudinal data. These include something called marginal structural models which are these wonderfully elegant and clever ways to deal with time dependent confounding when you're looking at time dependent exposures such as you would have in longitudinal studies.

Another method that is coming into its own is hierarchical models in which we consider several different levels of exposure at one time. Classic example is neighborhood effects versus effects of individual factors.

These are cool. But how often do we have data good enough to apply these methods? How often do we have data that satisfy the assumptions that are required by these methods? I never have. And I bet you haven't either.

More important than methods are the data. And getting longitudinal data is not easy. If we're thinking about exposures during pregnancy, which is my focus

here, those exposures are very difficult to reconstruct and sometimes impossible. When we're able to, the data are usually imprecise and they're often biased. And the same applies in general when we're trying to reconstruct the exposure of adults through childhood and adolescence. Guessing on those data is a tricky matter. And the only way to do it well is to do it prospectively. I'm unfortunately too old to start that kind of a prospective study. Some of you are young enough to do that. But I think prospective data are very important in this context.

But what if you do a prospective study and you don't ask the right question? So more important than the data is the hypothesis. What is the right question to ask?

So where do we get our hypothesis in epidemiology? We can get them from animal studies. I mentioned all the transplacental carcinogens that have showed up in the lab. We can generalize from past examples. We can have the alarm go off in our head when a disease starts to increase for no particular reason. We can start to worry about is it possible that some earlier factor is now producing this disease? We have for a long time relied on astute clinicians to give us hypotheses and epidemiologists, and I think we also have to rely on astute public health workers. People who are actually in the trenches seeing what's going on firsthand maybe can put two and two together in a way that someone more removed wouldn't do so easily.

Which hypotheses are ones that are important? I'm going to just suggest a few based on what we've already observed. Rubella and influenza are infections that have long-term repercussions. Maybe infections in general are something we ought to pay lots of attention to in terms of long-term follow-up for kids who have seemingly survived their initially perinatal infection.

We know that alcohol produces Fetal Alcohol Syndrome with a lot of serious sequences over lifetime. Maybe we should be concerned about other self administered drugs that are given at high doses and regularly.

And then there's DES. Prescribed drugs.

How about environmental things? You notice I haven't talked much about the environment, and I work at the Environmental Health Institute. They yell at me. But the fact is it's really hard to show how these environmental exposures that are a source of public anxiety such as environmental estrogens or persistent pesticides, it's hard to show health effects of these things. Not that we shouldn't be trying. But if I had to put my money somewhere, I'd start with infections and with drugs that we know people are getting that have pharmacologic action.

Which outcomes? And I'll try and wrap up here quickly, Michael. Testicular cancer is a really interesting outcome but it occurs in young people, young men. So the latency from pregnancy or early childhood to the cancer is relatively short.

It's also one of the only cancers that is increasing in prevalence in its incidence in western countries. So there's a lot of interest among the people who have studied testicular cancer to look for early exposures. And I think there's very possibly something they're going to find.

Asthma as we know is increasing in frequency and pregnancy exposures and early childhood exposures are high on everybody's list. Michael mentioned obesity. There are now a couple of papers suggesting that the obesity epidemic seemed to start with babies born in the 1960s that there's a cohort effect going on here. And if that's the case, it does push us more to think about factors very early in life.

Autism. Everybody's favorite hot potato. We know it's not thimerosal and it's not vaccines. But do we know it's not other things that are happening to women during pregnancy that deserves to be looked at? And I think any health end point that's associated with birth weight deserves to be looked at.

Schizophrenia is associated with birth weight that points strongly to having its roots well before the outbreak have the disease, that the roots lie in early life and maybe there's in preventable causes there.

So I'll end by saying some things that are not so mysterious or weren't obvious to you when you walked in the room.

Fetal life and infancy are vulnerable periods. We all know that.

The effects of toxic exposures to the fetus and the infant may not be obvious until later in life, which we also know and ought to be a source of some worry to us. And something that we keep in the back of our mind.

The possible outcomes are diverse. I can't tell you only to look at cancers or only to look at neurologic outcomes. We don't know -- or only look at cardiovascular disease. It's probably a lot of things.

The threats are real. And what's frustrating is that the extent of these threats is unknown. And the one small optimistic thing I can say is that if we don't look for it, we won't find it. So I want to leave you with a higher index of suspicion than you came in with. Thank you.

[Applause].

MARIO DRUMMONDS: How is everybody doing out there? Great. First I would like to thank Dr. Wanda Barfield for inviting me to speak with all of you today. I'm a practitioner, I'm not an epidemiologist. I used to be a researcher many years ago, but I think it's important that you hear from folks who are in the field, in the trenches, as Dr. Wilcox talked about earlier.

[Inaudible] life course theory has pretty much swept the nation, you know. Ever since Dr. Lu and Dr. Halfon's paper in 2003, it has influenced, you know, public health in general but more importantly it has influenced all of you in the MCH industry.

While you've been influenced, right, life course theory to me and to some of my colleagues in the field is still very much an abstraction. While there's been many attempts to operationalize life course theory and make it really for practitioners in the field on a day-to-day basis, we're still dealing with an abstraction. And it's our task to actually try to hopefully take life course theory and make it real for the practitioners that are out there in the field. But more importantly life course theory has to impact and influence the lives of women of childbearing age as well as their family members and husbands on a day-to-day basis.

My task in the next 20 minutes is to talk my thesis really is to talk about how to do that in the format of what I call an MCH life course organization. And you'll know more about that as I move forward in this presentation.

There are a number of theoretical assumptions and implications to practice that falls from the theoretical formulation. And definitely one have the most important ones is that -- and even so some parts of the industry doesn't really want to move from this question is that prenatal care is important but it's not sufficient in terms of reducing longstanding racial disparities in birth outcomes.

A lot of people talked about today the whole notion of maternal health prior to pregnancy as an important variable that we need to focus on. And for us in the field, that means that we have to transition from a focus on perinatal case management to an interconceptional care approach to practice, or women's care focus to our work.

Life course theory also tells us that it's -- this thing is going to take some time. You know, anybody that's going to try to develop a life course approach to practice and think they're going to do that within, you know, a two to three year period, you're playing games with yourself. And that you really need to be thinking on a long-term perspective. And I'll be talking about a few models that have been doing that over the last 15 or 20 years.

Now I'm having that problem. Okay. Here's your traditional paradigm that you've been working with in this industry, whether you are a clinician or a public health person. And I argue that if life course theory is real, this paradigm has to change. It's not enough. It's a nine month snapshot and it doesn't really provide the clarity and the new ways that we need to practice as clinicians and as administrators to execute life course theory in and of itself.

It was a great model 10, 15 years ago, but I'm proposing a different model. And some of my colleagues around the country are proposing a different model in terms of structuring our work over a period of time.

And this model begins here. I'm looking at now -- I have two axes. I have axis one, which it goes across the life course in and of itself thinking about birth, early childhood, preteen, teen, young adult, women over 35, and our senior citizens. Now, within Harlem, New York, these are basically categories that can take place programmatic interventions, clinical interventions that can take place in each one of these stages across the life-course.

So as you see at birth we've built a birthing center at Harlem Hospital that's tied to our perinatal case management operations that we have at the birth stage. We're experimenting with centering pregnancy just to give you an example. I don't have time to go into each one of these particular stages, but here you just need to understand the new paradigm shift that we need to start to think about.

Axis two is a little bit different. Here we're now looking at a social determinance framework of swimming upstream, looking at individual clinical interventions all the way up to group. We're moving up to the policy level. And the logic here is as we move upstream and do our work successfully, we'll be able to influence individual development. And I'll give you concrete examples of that as we go forward in this presentation.

As you see here, these are certain things that we're doing on the individual level all the way up to policy level interventions that we are working up, you know, in our mix. So this is just a framework that I am proposing that some of us in different parts of the country are utilizing to guide our day-to-day clinical and policy and administrative work in the field women of childbearing age.

Now, this here begins on the individual level. These are some of our assets that we've deployed in the central Harlem area. In central Harlem we have five zip codes. What we decided almost 18 years ago based on looking at mapping data and other socioeconomic data was that there was one zip code in central Harlem that had all the poverty, had all the family dislocation, that had all the child abuse and neglect and that we was going to deploy our clinical and programmatic assets in that geographical area. For us it's called the St. Nicholas houses where we're dealing with over 10,000 women of childbearing age in one geographical setting.

So the health department is not a part of us, but they have the nearest family partnership intervention. We control central Harlem Healthy Start, our mankind fatherhood intervention, our baby steps, healthy family America model of home visiting, teenage pregnancy prevention intervention as well as Head Start/UPK, Early Head Start, interventions in a very geographical construct that we can measure and do follow-up work to see if outcomes can come about.

Our whole hypothesis here was if we can clean up infant mortality in zip code area 10027, it will have a very, very dramatic effect on the population based data for central Harlem overall. We didn't have the resources to be in all five zip codes. So we had to make some decisions and some selections.

On a group level in terms of Dr. Lu's notion of reproductive social capital, we've developed certain types of interventions, clinical interventions and group interventions that actually help build that level of resiliency among women of childbearing age that's in our cohorts. And so here you see a number of interventions that I don't have time to talk about fully. A lot of you know about them. Some of them are actually our own interventions themselves.

On organizational level going upstream again, once you move to the organizational and the community level, you're moving now towards coalitional structures, public health coalitional structures, advocacy structures and legislative interventions that you need to actually build as part of the MCH life course organization. And so you see some of these things here as we move upstream in terms of assets that we've developed within our organizational structure.

On the community environmental level, other types of structures that we've built with the city health department. Other types of coalitions that we either lead or

are part of that's going to help us change the milieu that women of childbearing age in central Harlem live in. And that's one of the hypothesis that I'm going to talk about later on in the presentation. And then of course on the policy level, you need to have structure that's going to produce very, very specific results on the legislative and the policy level. And these particular entities pretty much controlled by NMPP are the entities that helped us produce actual very specific results on policy level.

So a lot of people say okay, Mario Drummond, you know, we can't be like NMPP, we cannot be like the Northern Manhattan Perinatal Partnership, but yes, in 1995 we were very, very small organization, right, with maybe about 20 staff people, an operating budget of \$800,000 and a mission where infant mortality was running rampant in our community.

But we had to begin to slowly build capacity, even though we didn't know anything about the life course theory. My board and I were operating informally from this logic that we needed to move beyond just individual clinical interventions and swim upstream.

Now today, we are a complex organization with 26 funding streams, several programmatic interventions, clinical interventions along each one of those axes that I talked about. Look at that purple box there is our on early childhood

operations. And as you see, we are very, very complex in terms of Early Head Start, Head Start/UPK.

Why is this important? We believe that by being involved in these businesses, it allows from us a perinatal perspective to follow women and the children at the next stage of the life-course. And so we built organizational capacity at this particular level so we can actually have a primary care impact at this next stage. And I argue and recommend that all MCH organizations, whether health departments or private 501c3s to be in the early childhood business. That's a very good way to follow these moms across the life-course.

Now let's talk a little bit about some of the outcomes that we've been able to achieve from a public policy perspective based on our upstream work. In New York State I'm starting in 2001. We've regionalized perinatal care. This is something on definitely our agency did the not drive. This was our state health department and our governor who decided to do this work. I could talk about, you know, the new hospital that was built as a result of us building a birthing center in 2003. Our mayor gave us 250 million dollars to set up and build the new Harlem hospital.

Go on in terms of our designation at Harlem hospital is the second entity in New York State to receive baby friendly designation based on a quality movement that we actually built in our strategic alliance with Harlem Hospital, the Northern

Manhattan Perinatal Partnership, legislative victories, policy victories, our work in the area of affordable housing really led by our mayor who has put together 7.5 billion dollar plan to build 163,000 units of affordable housing where 82,000 units have already been built and on and on.

So what is an MCH life course organization? Here's my working definition of MCH life course organization as an entity, local or state. There are statewide ones that develops the capacity over time to deliver integrated continuous and comprehensive health and social services and support to women and their family members from the womb to the tomb.

MCH life course organizations unlike what federal Healthy Start programs used to always focus on, which is the health system, they influence not only the health system but the economic development system in their geographic area, the housing system, MCH life course organizations have legislative agendas, child welfare agendas and early childhood agendas. You have to influence all of these systems to bring about the outcomes that I'm going to talk about, the clinical outcomes for women of childbearing age which we did in Harlem and which other projects in Dane County and in DC are doing today.

Now, in terms of the types of models that I'm talking about, NMPP is definitely one of them, but definitely a lot of you have been hearing about the work nationally over in Dane County. And the [inaudible] system where once again

they've pieced together a number of programmatic services into one organizational focus and have brought about some very good birth outcomes for African-American women in Dane County as well as Dr. Lubic and Dr. Randolph over in DC in terms of their DC developing family centers.

Once again, these are like maternity models that are showing good results in terms of birth outcomes. There are also some emerging MCH life course initiatives not as advanced as the last three that I just mentioned to you, Contra Costa there's Sherry Pike [Phonetic] here over in the audience right over there doing some great work and a 15-year initiative. The same thing for Alameda County Health Department. Dr. Michael Lu and I have been out there working with the health department to begin to think long term and structure new organizational forms to actually bring about better outcomes for African-American women in those sectors. And then of course another experiment in the Wisconsin partnership Lorraine Latham and her colleagues in the state of Wisconsin are developing MCH life course organizations in Racine and Milwaukee and Kenosha, small cities where the infant mortality rates are very, very high in those areas.

Let's look at some of our central Harlem data. Of course in 1990 we had the highest infant mortality rate in the nation of almost 28 deaths per 1,000 live births. And over a period of time that we was unstable back and forth with our data in terms of the reduction of infant mortality in the central Harlem community.

All the way to 2005 -- excuse me, 2004 where we have been able to reduce the infant mortality rate down to 5.1 deaths.

Our agency is also responsible programatically for other subcommunities in the Northern Manhattan arena, east Harlem, Washington Heights in particular. And as you can see, the data as it relates to infant mortality has gone down tremendously.

This is another summary of our work as it relates to first trimester. We still try to work on getting women into prenatal care in the first trimester. It has some clinical benefits, but we know we have to do more along the other axis to actually move or women to another stage of development.

Let's look at the data around Dane County. That orange slope is the Dane County African-American infant mortality rate decline based on again of course CDC is there now looking at a number of variables that might explain this phenomena of the quick drop in infant mortality where now the infant mortality rate is equal to whites in the Dane County area. My hypothesis is very clear that the organization of health services have been organized in Dane County and what new community -- a sense of community that's been built among African-American women of childbearing age in the Dane County area explains -- it's a partial explanation for this particular phenomena.

1:04

Now, I'm going to end my presentation by raising a number of research questions for all of you to consider and ponder as you think about methods and data in trying to do this work. And the first question that I have for all of you is our one stop place behave culturally relevant synergistically coordinated service options for maternity care are the best way forward to improve birth outcomes among African-American women and moms. Of course my hypothesis is that it does. But again, there are other questions that related -- that are related to this one.

What are the best methods in organizational strategies to link and deliver MCH service that will reduce racial disparities in birth outcomes, right? We need to go into those three or four models that...

What are the best methods in organizational strategies to link and deliver MCH services that will reduce racial disparities in birth outcomes, right? We need to go into those three or four models, our model and the model in DC and Dane County and begin to think real hard about how we link services, our leadership styles, the organizational structure for me I've always argued that the more that you can have inside of your administrative structure, the more you could control quality, the more you can have hire and fire capabilities, the more you can get to outcomes and results.

The more that you have other people say well we like coalition structures. And I think that those things have value also but we really need to research this a little bit more.

Why have other MCH one stop operations failed to reduce disparities in racial disparity income colleagues around the country have not produced the outcomes that we've produced in Harlem that have been produced in Dane County and have been produced in DC. We need to actually look at those interventions to see how are they different from the interventions in those three towns that have produced better outcomes.

So I'm not totally sold on this one-stop model. We need to actually flesh this out and take a look at it in a very deeper way.

What are the unique characteristics, I talked about this -- I'm going to pass on that one. And I want to talk about some upstream questions that I have for you that you need to ponder as we move forward in doing this work.

How much of the decline in infant mortality in Central Harlem over the past 10 years can be attributed to the integration efforts that we've done in terms of MCH home visiting programs, early childhood and child welfare prevention services

which provide various support services to women in need from the zero to five period.

We have a hypothesis that the close integration in this zero to five period of those type of program models have helped us reduce infant mortality but not only do that, reduce the number of families entering the child welfare system in our town.

In New York City, in early '90s, we had over 50,000 children in the child welfare system. Now we have about 17,000.

Let's look at our child welfare data trends for Central Harlem, along every measure that you measure a child welfare system, we've been able to make operational, measurable advances in reducing the number of reports and reducing the number of other variables how we measure a child welfare system.

I believe that our work in the integration has not only helped us in reducing infant mortality but it's also helped us in terms of reducing child abuse and neglect by integrating -- here's a flyer we did in 2004, where we brought our health department together, and I know Debbie Kaplan is out there in the audience. She's speaking tomorrow, and the head of our child welfare system, Dr. Matherly, and got those two systems to begin to talk to each other.

Before when they were serving the same client base, but we needed to -- there's certain programmatic models in each one of those systems that we needed to integrate. And so we began to do that. That produced the outcomes that I just showed you around child welfare in Central Harlem.

How much of the decline in infant mortality in Central Harlem can be attributed to demographic and class transformations where over 10% of the women who were poverty stricken left the community by 2006 and were replaced by women with higher income and history of birth outcomes. Colleagues, I'm being very clear with you. We do not believe our clinical and public policy interventions alone brought about the decline in infant mortality.

I've talked about this with Milt on several occasions. We argue very clearly that based on Gentrification in Central Harlem more and more women who are coming to live in our community who are making \$250,000 a year, their health-seeking behaviors are different, right?

So when we've lost that level of population and replaced that population with women of child bearing age who actually go and deal with the doctor and go and deal with their healthcare, our data is going to look better.

Here is one of our premiere sociologists in New York City who has done a quick analysis of race changes in the Central Harlem community, starting all the way in

1910 where African-Americans or blacks at that time were only about 9% of the Central Harlem population, and as we move forward in years, Central Harlem became the mecca of black America and African-American population grew and grew. Now we're on this somewhat downward slope in terms of total population, where more whites and other ethnic groups with better birth outcomes are moving into our neighborhood and are influencing our data.

Thus moving beyond a medical model, by addressing social and economic inequities that African-American women experience daily reduce racial disparities and birth outcomes. We need to look at more structured studies for the work that we're doing upstream to see how that has impacted the health behaviors of women in urban centers like Central Harlem and all across America.

And then finally what role does building social and community networks, civic engagements and local identity and solidarity in African-American play in reducing racial disparities in birth outcomes. Dr. Liu and others talk about this notion of a sense of community and identity. We've been able to build a new community in parts of Central Harlem and also what I've seen in the Dane County area, where this notion and sense of community has rallied women of child bearing age to actually have a better and a different view of what health is.

We need to actually operationalize and develop constructs around these concepts of identity and social networks. Some of our colleagues have

developed books on this, particularly one of our anthropologists in New York City have looked at this.

But we need to actually tie it back to birth outcomes. A good example of some of our work is some of our clients have developed their own stories about called Collard Greens for the [indiscernible] Soul is part of our social intervention of women of child bearing age to talk about when they were raped, to talk about the problems that they've had with relationships and how it impacts their birth.

I believe that this group identity is a big part of the solution of how we bring about better birth outcomes in urban and rural areas of America.

Finally, does switching to an interconceptional care focused perinatal case management practice helps to reduce the black/white gap in birth outcomes.

I know Mary Kay Muse and others, folks here at CDC, have been doing a lot of work around preconception and interconception care. But do we really know that these interventions bring about better birth outcomes, what are the clinical outcomes achieved within the interconceptional demonstration projects in Atlanta and Denver and Jacksonville and Philadelphia.

Have they been able to reduce the risk of recurrent low birthweight births? I think we have a lot to think about. And I'll end on a note that the new form of MCH

organization today in terms of piecing together different services is what I call an MCH life course organization.

I think that this organizational model has to be studied a little bit more, but for the most part I've shown through my presentation in Harlem and in DC and in the Dane County area this new form of piecing together maternity services might be a new way out to bring about better birth outcomes. Thank you very much.

(Applause)

MILTON KOTELCHUCK: Thank you very much for having me. I'm honored to be on the same panel. I didn't know I was going to be on this panel. As some of you might know, I'm not Neil Halfen who is in the book listed as the speaker. Neil was unable to make it and I learned at lunchtime today that I was being recruited to participate.

And Neil, I understood, had 70 slides. He's a fast talker in his 15 minutes but fortunately for you I have brought my stick along that has 7,000 slides so I just happen to have a talk that was somewhat appropriate for the occasion today.

And really I think I'm going to give you my summary right in the beginning, because time is going to -- it's like being the speaker just before lunch, this is a problem. It's a long day.

I just want to say I'm the pep talk guy. I'm the one who really wants to talk to our community here today and really talk and think about what is life course and life course epidemiology, what role do we have to play and how can we really participate in this.

And I just want to first note that we really heard the two facets of MCH life course in actually the last two presenters. One is a research focus, looking at causation, looking at prevention. And the second is an intervention model. Thinking about life course as an intervention model.

Both of those are central features of this sort of new life course model. This new life course paradigm, that is growing to have a lot of acceptance and interest in our community.

And does it have a role for us here in our world. Well, let me just say, this is like a tremendous opportunity for the MCH EPI crowd. I don't know. This is like a really exciting opportunity. There's like a whole new world of activity coming along with this particular model. In fact, not to be a little too humorous about it but it's almost like an employment act for us.

This is a chance -- there's so many new opportunities here. All these models that we're talking about today, both in the practice and in the theory, are -- and the research and the practice, these are theoretical models. There's actually no

evidence whatsoever -- I write -- I love writing and talking about MCH life course, but there actually is really no evidence that -- you can see an evidence base building up slowly but steadily but that's our challenge.

We're the ones who are actually going to prove or not prove whether these models work. That's why it's so exciting for us. And actually I think it's a tremendous challenge for us. It's going to take actually all of our skills and creativity to really be able to test out, to develop the instruments, the data, the models, the hypotheses that we're going to need to move this forward, and it's something we can do now.

This is the period -- this is why it's so exciting and why I've been so excited about working in this area. Okay. So my talk today really -- I'm going to do it relatively quickly for time reasons.

Really the goal of this talk is to kind of assess where the MCH EPI field is and its analytic readiness for the life course approach. I want to present several of the key barriers that we have to address to better implement the life course approach to MCH EPI, in the

MCH EPI world and I hope I'll mention some really nice opportunities that exist.

And ultimately this is really to stimulate a discussion about the future opportunities to advance life course approach in MCH EPI which I hope everybody will do throughout the entire conference, because clearly that's been the focus of this conference.

So I want to discuss quickly some of the key domains that need to be addressed. I want to talk about databases, variable development analytic needs and applications, contextual analytic needs and applications, confidentiality concerns, and some new research opportunities. And not to forget to talk about training activities and how to generate the political will and resources to pull off all of these things that many of us are talking about.

Okay. First let's start with -- actually, I'm going to say several of the same points that I believe Alan said. And these slides came from a couple of years ago I was giving this kind of talk. That's why I have some of these written.

But really life course databases exist, but on one level they're really underutilized. They do exist life course databases. The European longitudinal health databases do exist.

Like the half a dozen people in this room have figured out a way to get to over to the Europeans and work with them. They're actually pretty willing to work with us, they do have them but they're not in the U.S.

There are some occasional U.S. intergenerational research studies. Sometimes people look at issues of successive births, of births from one generation to the other but they're relatively rare.

Longitudinal approaches are quite widespread in the development. In the child development world. They think developmentally and longitudinally. They have for years. They've been collecting longitudinal data for a long time but they don't collect any data on the parents, on the mothers or the fathers.

So they've got like part of the information. They exist but they're almost totally underutilized. There are lots of longitudinal databases around. School health data is a longitudinal database. But we rarely exploit it. Frankly, we rarely exploit it because none of us can get into that database because the FERPA, the federal -- I can't remember what it stands for, Federal Education Reporting and Protection Act -- I'm making this up, but it's the HIPAA (Laughter), it's the HIPAA of the education world.

It's a very restrictive database. So it's very hard to get access to school health data. HMOs tend to have very good data that could be examined longitudinally but we don't tend to do it very much.

There has been on a positive note a growth in research oriented longitudinal databases in the United States. The Early Childhood Longitudinal Study is a very effective longitudinal database looking from zero to five years of age of 10,000 births in this country, and I wrote an editorial which I point out that you could study mothers. And they focused on children but they interviewed the mother.

So there's good data on maternal health as well as child health you can put them together in the same models.

The National Children's Study is a tremendous opportunity. For those who will be around in 20 years, which may or may not be myself and Alan, among others, who can exploit this database so effectively. But this is a tremendous opportunity in the United States that both is looking at environmental issues and a wide range of socio cultural -- socioeconomic issues as well as health issues.

It has its limitations. Actually, Alan's point was well taken. It's not clear all that people can think 20 years ahead what are the hypotheses to look at. It's a database. It's actually not a study.

But it does exist and it's an opportunity and probably half the people in the audience are working on some variation of it in your local area.

All right. There you go. A lot of our data systems could be enhanced to collect more longitudinal information. We're going to think longitudinally, let's use our databases. Why are we not capturing maternal health history information in the PRAMS database? In the youth surveys, the birth certificate. If we want to know about immigration history or perceived changes in social class and early childhood experiences, ask.

One of the things we spend all of our time doing is coming up with these derived measures when we should just be going out and asking. They may not be you such great at first we'll probably do a pretty bad job of our sensitivity of capturing these things, but right now we have no sensitivity because we don't ask about these topics.

To be pushing for them continuously as these things develop. Okay. There's also really no or very limited databases for certain key time periods, which is really a problem in our thinking about that.

So we really have very little data on kids three to five years of age. All of us know this. We have all this great data on birth and maybe a little after birth and maybe immunization and then what do we have on a population bases until the kids are at school which we can't get the data anyway.

But that's another issue. I'll skip the next point. Early motherhood and fatherhood databases are missing. We actually don't look at early parenthood as a time to collect data rather than doing it by chronological age, do it by developmental age in people's lives. Our data based on interconnection, prenatal, post partum maternal health status, it's just missing. These are data areas that are critical for our kind of thinking.

So databases is one issue. Can we develop, can we use them? A second issue is can we develop the variables that go with the life course model? That's particularly a challenge that this group could easily undertake.

We have very few simplistic life course variables that exist right now. Years of education. Birth place, age, parity, those are life course variables. They're weak. They're good, but they're not sufficient.

We need to think and create more meaningful life course models. We don't know, for example. So Michael talks -- I listened to him talk on many occasions, and he talks very eloquently about alostatic load. It's a brilliant concept. How would we measure alostatic load?

When we look at things like the weathering hypothesis which is a very central concept of this, really all we're measuring is age. Sometimes we have a social class variation to it but the reality is that is not a good measure of alostatic load.

We need to think creatively about cumulative measures like person years in poverty.

I don't know what these measures are, but we can think about them. Those are our challenges. That's what our field is actually good at doing.

We also need to think about cumulative health service measures because it's not just risk measures it's also the services we get. So the concept of a medical home is a longitudinal concept. It's intrinsically a longitudinal concept. It's not like once you have it you don't have it. You have it for a while supposedly.

Immunization status is another example of a longitudinal service measure.

Again, we need to think about cumulative program impact measures and not simply whether you participate or you don't participate.

You'll see the same point. The third point, we need to think about how to think about cumulative longitudinal outcomes, again a topic I thought Alan also started to raise. The geriatric community, the other end of the world has done a tremendous job in thinking about a much wider range of life course outcomes than we do in the MCH world.

They think about the functional status, all kinds of issues about health of people and the far end of their life course. We don't tend to think very much about this.

The functionality -- the functional health status measures of the World Health Organization are a fabulous set of measures. Nobody uses them in this country hardly.

You know, there are other measures around that people are starting to think about, as I sort of say somewhere in the next slide we've got to kind of move away from do you have this illness, yes or no. Is it severe or not severe? Those are okay measures. We do a good job with them. We need to sort of stop thinking algebraically and start thinking like in calculus thinking, thinking about trajectories and not sort of fixed points.

We need to strengthen and modify our longitudinal and analytic methods and applications. I was actually glad that Alan mentioned about marginal structural models. There's really some exciting work going on thinking about longitudinal analysis. Most of us in the room actually don't know how to do it. Although we'll be the ones asked to think about these things and do it in our work. I think we have work to be done in developing our longitudinal models.

I think we've talked about this. I think one of the interesting things that I usually, if I had a lot more time, I would go into. I really have always been excited by the World Health Organization's efforts to develop growth standards as well as growth norms when they're -- try to see what's the optimal -- they looked at weight and height for children and also motor development and optimal

communities in the world and developed standards off those optimal things that we could look at what's the optimal we could do and not merely just normative growths. These are interesting and exciting ways of starting to think about longitudinal activities.

We need to think more about the context in which lodge -- in which life course models are taking place. And, again, multi-level modeling is something we've really spent a fair amount of time developing in this recent period. GIS systems offer some interesting opportunities. Although the GIS world is only beginning to start really doing some interesting work on time variables within GIS models.

But, again, we need work in as a field, as an MCH EPI field to think about strengthening our model building.

Confidentiality. You know, it's not sufficient to just sit here and talk about all the data. The reality is that longitudinal databases tend to be very personal. You have 127 measures on a person. You tell me that I can't identify that person in the world. It's very difficult not to have a lot of data that hooks together in critical ways.

So confidentiality has become even more of a conflict. I actually think that the Feds haven't quite caught on to how complicated this issue is. But there's also barriers among the different -- the HIPAA barriers and FERPA barriers are a real

problem for us. You can't get from one system to another and they don't talk to each other. My Massachusetts colleagues know we've been meeting for, what, two years, with the department, maybe three years now with the Department of Early, EES. They changed their name. I always call them the Department of Education. They're trying to study autism. The Department of Public Health has zero to three requirements. They have it from three to 21. It's the same kids. It's the most costly issue in the state.

Everybody knows the kids are moving from one system to another and we can't get the same data. So talk about what's happening or not happening. Very important issues that are kind of coming up.

Does a child that becomes 18 have the right to re consent to data collected about him or her as a minor? This is a major issue for the national children's study. When those kids turn 18, that data actually belongs to the kids, not to the parents and everybody else who consented earlier. It's going to be an incredible challenge to see how that's handled.

Do we want to have a permanent health identification number? Those of us who really, who do a lot of data linkage, which I skipped over on this slide, data linkage is inherently a longitudinal concept, when you bring two databases together, they always are slightly different time inputs. They're inherently

longitudinal. Much more longitudinal than what I thought when I started working on it. But do we want to have a permanent number.

We're going to change our national health, what we may have some changes in the way national healthcare is -- (Laughter) -- funded in this next period.

In the last -- in the last administration, in the Clinton administration, they proposed a national identification number.

I will skip over the many research opportunities. Just want to remind us that there are many opportunities for training needs that this group could do. We need to create the political will, the cash, the supports. But one of the main things in political that's actually what's happening here today is we ourselves are convincing ourselves that this is really an important direction for us to be going in.

That's actually what the purpose of this is. We are the leaders of this field, and we are really, both learning ourselves and becoming enthused about the opportunities in this kind of approach.

I just wanted to say, and I'll stop on the last two slides. Since some of these slides came from a talk a couple years ago, I tried to think what's happened in our environment over the last two years since I first started developing these slides. And these were really meant to be a quick presentation of ideas.

Well, these are the things that's happened in the last two years that have made this a more exciting thing. The life course is now much more widely embraced in the MCH field than it was a couple years ago. I think those who have been working and talking should feel good about what's happening.

The political environment's changing, and the national healthcare legislation, those of us who work in this area we should be talking about what are the new opportunities that are coming our way. If you don't have to have Medicaid being cut off after 60 days, where you have healthcare before a person gets pregnant, that changes all kinds of things for us, both politically and as MCH epidemiologists.

Electronic medical records is a new phenomena sort of thing. This is actually a form of longitudinal data collection. I don't think most people who do electronic medical records have begun to think about what the epidemiological possibilities. It's almost completely a clinical issue and improving clinical practice. That's great.

But we're going to be involved in thinking about what we could do with it from an EPI point of view. There's been a tremendous growth and issues around quality improvement. And one of the side effects of quality improvement is the development of new practice measures. There's a lot of groups out there trying to

think how would we know that we're doing a good job? If you measure it, it happens.

Growth in the -- I want to say growth in the private sector, private sector's jumping into health data linkages and data mining and capturing data. You can put all your records on Google Health. There's a lot of people out there. Think about it. It's probably good in many ways because it's going to bring a lot more people in. But for those of us who work in the public sector we'll have to think about our roles a lot in this period.

There's growing concerns about confidentiality, which is really sort of the other side of the great interest in having all of our data linked together and we'll have to be able to defend population databases and then I think many of the emerging issues tend to be life course-related issues, such as childhood obesity and others.

I'll end by saying I hope I gave you some ideas really fast about the ways in which there are new opportunities for research. In the end life course models I believe and we believe can be really help us understand and improve the health of women, children and families but they remain to be tested. This is our challenge for the MCH EPI field we need to create new strategic agenda to implement it in our field. And I hope my talk, and I believe all the other talks,

stimulated you to think about how MCH EPI can play a key role in moving this paradigm forward about life course models. Thank you very much.

(Applause)

UNKNOWN SPEAKER: Before we end, I have a request for all of you, I know our time is up. If we were in grade school in a classroom the bell would have rung and you all would be gone already. And so in fact I have to say I'm very impressed that there's still so many people here. In fact, in scanning the room, I saw nobody falling asleep, which is pretty good for the past 5:00 in the afternoon.

Then I realized you're probably still here because you actually care about this stuff and want to have a chance to talk about this stuff. So I'm going to ask Dr. Bar field and Dr. [Indiscernible] we'll borrow like five more minutes and take some questions and comments that you may have. Those of you that have to leave feel free to leave quietly. Our feelings won't get hurt. But take a few questions if there are any questions or comments out there.

UNKNOWN SPEAKER: My name is [indiscernible] from Chicago. [Indiscernible] and actually my question is for Mario Drummonds. When you talked about community connected and identity, in Chicago I was wondering if you could talk about how did your organization build leadership capacity and organize at the community level, particularly in the St. Nicholas housing area, and could you talk about that?

MARIO DRUMMONDS: Yes, of course. Is this mic on? Testing, one two, three. Good question. In terms of leadership, leadership has to be in a variety of levels within the organizational structure and in terms of expanding and growing our bench, our management team bench within our agency. Of course, one of the things that I quickly did was go out and steal other operators, other clinicians and administrators from other agencies so we could quickly build up capacity to actually launch and manage 26 funding streams within our agency in and of itself.

But of course the true strategy in terms of leadership development is to grow leaders from within inside the organization itself.

So we set upon the task of developing a leadership training institute within our agency, to look at line and mid-level staff that had the potential to step up and lead a unit or be a community leader in and of itself.

On the final rung of that is our consumers. And so we built a consumer involvement organization within our agency and throughout our agency where consumers themselves get an opportunity to learn about Roberts Rules. Get an opportunity to analyze all budget. Get an opportunity to understand what organizational strategy is all about. Get an opportunity to actually run their own organization and also advise us in management in terms of what we're doing.

So I know time is short. I don't want to go too long on this, but those are some of the things that we did in terms of developing internal leaders within our organization and among our consumer base.

UNKNOWN SPEAKER: I'm Sara Santana from Arizona. 15 or 20 years ago, in a very contested session, contentious session at HPA people were debating whether prenatal care really did affect birthweight or birth outcomes and whether home visiting prebirth affected birth outcomes, and all these different papers being presented. And Pierre Bukins stood up, who had just come in from Belgium, and he was very puzzled.

He said, "I really don't understand you Americans. In Europe we don't need to prove that these things are good to do. Whether or not they directly affect birthweight." And it seems to me, and this is very exciting as someone who likes to do the research as an epidemiologist, but it's very exciting to see that we're finally reaching the point in the U.S. where we have the evidence, the research to prove, in quotation marks, the biological pathways that make having a home, not being ill, being fed, having a social network, things that affect health throughout our whole life, you know.

So maybe this will help us to have the political will to do what Europeans have done for a long time, from the issue of confidentiality and longitudinal data to the

issue of providing support for each other in society. And not just the Europeans. I mean, I can go back to the Black Panthers who were also feeding the hungry and healing the sick. And you can go back to the Beatitudes. And it's just exciting that now we're scientifically proving that these things are good. Thanks. (Laughter).

MARIO DRUMMONDS: Thanks for that comment.

(Applause)

UNKNOWN SPEAKER: Let's take two more.

UNKNOWN SPEAKER: Russell Kirby from the University of South Florida. I just spent the last two days leading the record linkage training. And one of the things I kept emphasizing over and over again is that we wouldn't need to be having [indiscernible] linkage if we would think fundamentally differently about the way we do all of our work.

And almost all the things that we do in public health are inherently cross-sectional in nature or even event-specific in nature because all the different data systems we have. And we need to think fundamentally differently about how we do all of our work if we want to move forward.

I'll give you a classic example of this. In the state of Virginia, when they decided, finally, to implement the new birth certificate, they realized that they had to redesign their databases, storing the new data. And, unfortunately, they sent the task down to an IT guy who knew nothing about vital statistics. And he came back and said, well, I decided to create two indexes for the birth certificate database.

And so now I'm looking [indiscernible] analysis and on the mother. So now, in the state of Virginia, when a birth occurs to a woman who has already had a baby, it's automatically built into the system.

So it would take a number of years as they generate enough data to actually do something with it. But it's something where they made a fundamental change. But if we think about many of our surveillance programs, autism is a classic example. Why aren't we doing population-based surveillance of autism in a prospective matter instead of a snapshot of eight years of old. Why aren't we doing that perspective? Why aren't we linking birth defect records to their sibs and looking across the family structure?

But you need a very different approach to the way that you manage the databases and a very different kind of thinking in order to actually actualize this. But my challenge to my good friends and colleagues in MCHB and CDC, you know we stop writing our [indiscernible] next week to continue this model. We

need to break out of the mold and we're never going to be able to actualize the life course approach if we continue to do things the way we're doing them now. That's one of our major challenges in terms of the infrastructure.

UNKNOWN SPEAKER: Thanks.

(Applause)

UNKNOWN SPEAKER: Okay. I think our time is up. So we'll stay around for any of you with individual questions. I want to thank all of our speakers and want to thank all of you for your attention.

(Applause)

UNKNOWN SPEAKER: I wanted to make some housekeeping announcements. I think, first of all, I want to just thank our panel speakers very much for a wonderful discussion. And there can be an opportunity to continue this discussion during the career mentoring session for students and young professionals, which is going to be in the Autobahn DEF area. So I invite our panel speakers to have an opportunity to participate in our mentoring session.

There are also two sessions that are going on. One this evening and one tomorrow morning, from six to 8:00 PM, we're going to have an open invitation that's going to have a discussion with tribal and urban EPI programs.

And then tomorrow morning, if you're excited and revved up to wake up at 7:00 a.m., folks, there will be an open invitation discussion group on MCH EPI, and that will include all participants.

So we can continue to have these discussions about the life course. Thank you very much.