AHRQ's Effective Health Care Program Presents:
What Works to Prevent Obesity in Children?
A Comparative Effectiveness Review and Meta-Analysis
Moderator: Christen Horn
September 26, 2013
3:00 p.m. EDT

Web conference Title Slide [Slide 1]

Hello, everybody. Thank you so much for joining us. Thank you so much for your patience. We are here today to present "What Works to Prevent Obesity in Children: Findings from a Comparative Effectiveness Review and Meta-Analysis."

Slide 2

Here is the overview of what will be covered during today's Web conference.

We will begin with a very brief introduction to the Agency for Healthcare Research and Quality, or AHRQ, its Effective Health Care Program and Comparative Effectiveness Research from Bruce Seeman of the Office of Communications and Knowledge Transfer at AHRQ.

Then Dr. Wang will summarize findings from an AHRQ-funded comprehensive system review and meta-analysis on the Effectiveness of Childhood Obesity Intervention Programs conducted in high-income countries.

Dr. Wang is an Associate Professor at Johns Hopkins University Bloomberg School of Public Health and School of Medicine. His research interests focus on nutritional epidemiology, child health, and childhood obesity, just to name a few. Dr. Wang was the principal investigator on this review, and over 20 other experts have contributed to this project.

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Before we begin, please note that your audio line has been muted to prevent any background noise during the presentation. To ask a question, use the WebEx Q&A function. You may ask a question for the presenter at any time, but please note that all questions will be answered midway through and at the very end of the presentation.

If you are experiencing technical issues, you may also use the WebEx Q&A function to request help. Lastly, we would appreciate your feedback on this session. Share your thoughts using the short evaluation form that will appear on your screen once the meeting has ended. Just look for the tab marked "Evaluation" on the pop-up message. We promise there are very few questions and will only take a couple of minutes of your time.

And with that, I will turn it over to Bruce to discuss the Effective Health Care Program and AHRQ. All right, Bruce, you are all set.

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BRUCE SEEMAN: Thanks very much, Christen.

Welcome, everybody, to this afternoon's presentation on what we believe to be some very important research from AHRQ's Effective Health Care Program. Before I turn it over to Dr. Wang, just a couple of things I wanted to note for context.

As most of you know, the mission of the Agency for Healthcare Research and Quality is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. 80% of our budget is invested in grants and contracts focused on improving health care. The Effective Health Care Program, which was launched in 2005, provides current, unbiased evidence on clinical effectives of health care interventions that focuses on patient centered outcomes.

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It helps consumers, providers, and policymakers make informed choices. It does not make treatment recommendations and its long-term goal is to improve health care quality in patient health outcomes through informed decisionmaking by patients, providers, and policymakers.

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We define Comparative Effectiveness Research this way. Comparative effectiveness research is a type of patient-centered outcomes research that compares drugs, Medical devices, tests, surgeries --

MS. HORN: Excuse me, Bruce, I’m going to interrupt you just there. Scott Rowe, can you please mute your line? Thank you. So sorry, Bruce. Please go ahead.

MR. SEEMAN: No problem.

We define comparative effectiveness research as a type of patient-centered outcomes research, which compares drugs, medical devices, tests, surgeries, or ways to deliver health care so that patients and their families can make more informed choices.

Our findings -- comparative effectiveness findings are descriptive, not prescriptive, and are intended as tools for informed decisionmaking; they are not recommendations. And our findings highlight current evidence about effectiveness, risks, and side effects.

So that's a quick summary of AHRQ and the Effective Health Care Program, Comparative Effectiveness.

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And with that, I'd like to turn it over to Dr. Wang for details about his study. Dr. Wang?

MS. HORN: Dr. Wang, you might want to unmute your line; and then I think we're good to go.

DR. YOUFA WANG: Good afternoon, everyone. I'm very pleased to have this opportunity to share with you some of the main findings from this important study funded by the AHRQ.

I also want to acknowledge that this work has been done by a large number of people; in particular, about a hundred investigators from Hopkins, from the School of Public Health here, and also the School of Medicine.

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I have about 50 slides, so I may go through some of the slides very quickly. Some of the others, I may try to highlight. But I want to let you know, there is a full report, which is available online, more than 800 pages, that provides all the details about the results from this study. On the other hand, I also want to draw your attention. I will share with you some of the results conducted by our group, which are not included in the 800-page AHRQ report, because after we finished the AHRQ-funded analysis of the report, we later on conducted, updated this research this spring. And then we identified some additional studies, and also conducted a further analysis.

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My presentation will include the Foley and CLABSI sessions at the beginning of the introduction and then I'll share with you the main objectives of the AHRQ-funded study, and then talk about the method of review and the meta-analysis that were conducted. And then we will focus on the results.

We have got a lot of results, but we don't have the time. I can only share with you some of the key results; and then at the end, some conclusions, discussion, including some instructions for practitioners, what they may do with their patients.

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First of all, I want to actually share with you the take-home message that appears after this slide, if some of you want to go, you can go, because this is the most important message I want you to take with you.

The first one is obesity is a serious public health problem in terms of the problems, the consequences, et cetera. And then, based on our comprehensive review and meta-analysis, we found the evidence is moderate regarding the effectiveness of a school-based intervention for childhood obesity prevention.

In particular, physical activity interventions in a school-based setting with a family component, or identified diet and physical activity targeted intervention approaches that are effective, especially those that also have a component regarding the community.

However, the interventions conducted in other settings, such as, for example, family-based -- such as childcare-based, primary care-based are quite limited. Especially, there are very few studies that have impacted policy or environmental approaches or consumer health informatics strategies. Here are the basic consumer healthy informatics, we mean those that used the information technology; for example Web-based intervention, or mobile phones, et cetera.

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I probably do not need to spend a lot of time to talk about how serious the problem is or how high the prevalence of obesity is, because you've probably heard this from many other studies or results in newspapers. But I do want to mention to you obesity actually is not only a major public health threat in the United States, but is also a problem worldwide, in many countries, including many developing countries.

In the United States in particular, based on regional data, shows that some minority population groups, such as African American population or Hispanic or Native Indians, Native Americans, they have a higher prevalence of obesity. Some other underserved population groups, such as those with a low socioeconomic status, they may also have a higher prevalence.

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This slide shows the prevalence of combined prevalence of overweight and obesity in children and adolescents worldwide. As you can see, there are many different colors which shows the large variation in the prevalence of overweight and obesity, which can range from less than 30% or more than 30% in countries like the United States or Canada or some developing countries to only, let's say, about 10%, for example, in China or Russia.

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This slide just shows you the trends in the prevalence of obesity in the United States in children and adolescents. Here, obesity is defined based on BMI is greater than the 95th percentile.

As you can see, from the early '70s to recent years, especially to, let's say, 2007/2008, there have been less studies of trends in the prevalence. However, since the last study conducted between '07/'08, we see the trends in some population groups, seems to be decreasing. Especially in some lower, let's say, younger groups, such as preschool children or children between the ages of 6 and 11.

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However, if you were just to look at the prevalence of obesity, you may miss another very important message regarding the seriousness of obesity problems. That's what this slide shows you.

We conducted this study a few years ago based on the U.S. national data. Mainly the key message we showed here is, actually overtime, overweight or obese Americans, actually they are most severely overweight or obese.

We divided American -- in this case, American adolescents, from the thinnest group to the heaviest group, putting them into 100 group based on the data in the NHANES III survey that's between 1988 and 1994. And similarly, based on the data from '99 to '04, we also divided them into 100 groups. And then we compared the difference in the average of BMI, waist circumferences, trace of skinfold thickness, the overtime change in the thinnest group or the heaviest group. So this shows you, if each group will gain similar weight over time, usually you'll see a parallel line.

However, here, as you can see, that it clearly shows that the overweight or heavy group, over time, they gain more BMI, more waist circumferences, and the skinfold thickness. The second serious message we got here is actually children that gained more central obesity; that's what the pink line shows you. Some of you may know that our research shows actually waist circumference as a matter of central obesity is a better indicator of obesity-related consequences, better than BMI for example.

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Regarding the biology basis of obesity, actually it's not complicated at all; that's people eat too much but do not have enough exercise. If energy intake is greater than energy expenditure, over time, people will gain weight, because those energies will be saved in the body as adipose tissue.

On the other hand, if you really look into the biological mechanism, actually it's not that simple, because there are many other factors: individual biology, and other social and environmental factors that may influence what people may eat, and also how much physical activity they may have; and they influence the energy balance.

Even just looking at the biology issues, there are genetic differences. There are also the so-called fetal programming which is for children who are born, their fetal status the formation of their organs because of their mothers' exposure to certain nutritional environment may influence later on how they use their energy and the efficiency.

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That's why some people, they may be more efficiently be able to save their energy and adipose tissue compared to some others. That's why when people talk about the factors that are contributing to the obesity epidemic, it's quite complicated. There are many factors at different levels, as we just kind of mentioned here.

There are genetic factors, home influence, how parents provide meals for their children, and also what kind of a role model they may be, what community their family may live. That can directly influence how much exercise children may have; and also the school environment; for example, what kind of food children may be able to eat in the school cafeteria; and also what kind of physical education opportunities or physical activity they may have in school.

And then there are also the regional and national policy factors. Even in the United States, for example, compared to many other countries, including many European countries, in general, compared to people's income, food actually is very cheap. This makes it very easy for people to over-consume food and then be at risk for obesity.

There are the also the globalization factors -- global trade, in general, making food much more affordable for people in different parts of the world. If people think about some other developing countries, this globalization can help people increase their own income because they can export their products.

They have more income, and then they can buy more food, particularly from other countries, even in the United States; therefore, other countries produce more efficiently and at a lower risk, and then people in those countries, they can consume more energy.

And then there are many other factors, such as technology, transportation systems. All these dramatically influence people's lifestyle, and then there only unbalanced and contributing to the growing epidemic of obesity.

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The next slide shows a model put together by the International Obesity Task Force to just kind of highlight the factors at a different level that influence or contribute to obesity.

On the other hand, if people want to control obesity or prevent obesity, these are the factors they need to consider. I will not read all the details, as all of you will have a copy of the slide at the end, so that you can see the international factors, that was information, globalization, global trade.

There are national level policy, transportation, and cultural policy. And then there are community factors; for example, transportation, childcare, et cetera. And then there are work, school, home environmental issues that also influence people's energy expenditure and food intake.

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Okay, this slide just shows the similar part here to highlight there are many factors at different levels in the individuals, between the individual organizations, community, and national public policy.

All these influences at the end what people may eat, how much exercise people may have; and this affects obesity. So on one hand, this makes it very complicated if people are going to develop some comprehensive intervention programs to prevent obesity or reduce obesity. On the other hand, it is also very challenging to identify what's the key target to focus, and also what is most cost-effective.

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That's why there has been a great need for a lot of research to answer these important but sometimes quite complicated research questions. Childhood obesity prevention has been argued. It's very important. That's because obesity is very difficult to treat. Once people do develop obesity, it's very difficult to lose weight. Even when people have lost weight, usually they may gain weight because there are also a lot of factors that will make people gain the weight they lost.

Then there is the so-called "set point series," which means when your body develops obesity, the body will develop also mechanisms to keep the body weight at that level. On the other hand, in countries, especially like the United States, there have been debates regarding who should play a more important role; for example, whether it should be the individual, the parents, or the society or the government.

This is to the culture, the political system; but overall, in the United States over the years or the recent decade, there has been a stronger argument, consensus is that the government, the society, should play an increasingly important role, because the other emphasis has always been emphasis on the individual parents or home-based interventions.

In recent years, there are a number of leading health organizations who have recommended comprehensive interventions to fight obesity. They especially argue that the government should play an important role, such as the WHO [World Health Organization] and the Institute of Medicine. They all make this argument in their Lancet report.

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Regarding to prevent obesity with intervention approaches, the so-called "upstream" or "downstream" approach. The upstream approach that means try to focus on environment and the policy target a large number of people and others potentially can be impacted when [inaudible].

The downstream approach, you're a kind of an individual based, focused on people at a high risk or people who have already developed obesity and try to help them to lose weight.

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In the United States during recent decades, there have been a lot of national initiatives. Probably many of you already know that the First Lady has been a wonderful champion for many of these efforts, including the program called "Let's Move!"

And then at the White House, there is the Childhood Obesity Task Force, where a number of federal agencies have been drawn into these efforts, including the AHRQ. I know that's why they founded this study.

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The objective of our review study [inaudible] is to compare the effectiveness of a childhood obesity intervention program conducted in high-income countries. We aim to identify and then to evaluate all the different kinds of interventions that have been conducted over the past many years.

This includes financial studies conducted at schools, home, primary care, childcare, community, or interventions that use consumer health informatics, or a combination of some of these.

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Okay, this slide just mentions -- highlights the seven questions the initial study answered, and it just wants to test the effectiveness of these different interventions conducted at different settings.

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Just to review, it's conducted following a very vigorous study process that's the standard process of the AHRQ EHC Program.

I do want to tell you this is the first study that I have been involved with, and conducted, and I'm very impressed by how vigorous the methods and also the process, and actually want to share with you. Even though we said the project is fun and very exciting, and stuff like that but the whole process was often very stressful -- many deadlines and many players.

I remember even over the holiday, Christmas Holiday, some of us still needed to get the work done to meet the guidelines, followed a very vigorous process.

And also during this process, a large number of other stakeholders have been involved. This included people from institutions, universities, government agencies, such as the FDA. We also had representatives of parents. They provided feedback throughout the process.

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This slide highlights the process that the study followed. At the beginning, someone nominated this topic for AHRQ, and then after we identified this topic, it was important enough, and at Hopkins we got it funded.

We do it, and then we need to refine the study, the study protocol. And then we submit it to AHRQ; and then I try submitting to others for review. The comments come back to us, we refine it, and then we start this research and then data construction.

We start this, validate it, instruct it, and then conduct data analysis. There are qualitative analyses, quantitative analyses, including meta-analyses. We also assessed the strength of evidence, bias, et cetera, and then we developed a report. It's an 800-page document, very long document. There are many, many tables, many, many appendix, a huge amount of data.

Once we put the report together, the AHRQ put it in the public domain for the public to review. People comment on the report, including experts and also the general public. And then they provide us with feedback to revise the reports. And during the process, we also have been producing publications. Right now there are two papers that have already been published in "Pediatrics." We have a few more papers right now under review.

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Okay, this is kind of a conceptual framework of the study. We focused on children. We identified studies in different settings to answer the seven key questions. And then we assessed the intermediate outcomes of the interventions; for example, for

improvement in children's knowledge, attitude, behavior, including the behavior of physical activity.

And then the parent outcome of focus in this report analysis is the weight outcome. For example, trending prevalence of overweight and obesity, or changes in body mass index, or other adiposity measures such as waist circumferences of weight.

We also assessed the adverse effects of intervention. We also assessed some of the other obesity-related clinical outcomes, such as cardiovascular outcomes, or in particular blood pressure and blood repeat.

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With certain studies published, for this report through August 2, 2012, we searched several data sites -- databases, as you can see here, including MEDLINE, et cetera. That's the data included in the full report. As I mentioned at the beginning, after the report, we conducted another data search, a search for those studies published after this date through April of this year.

Okay, in this analysis, we mainly just included randomized controlled trials, RCT; but we also included quasi-experimental studies or natural experiments conducted in high-income countries. High-income country is based on the definition from the United Nation. At that time, we had a lot of discussion. Initially, one option we discussed is to try to identify studies in all different countries, but then we decided we just wanted to highlight and focus on studies in high-income countries.

There is a huge variation in countries in studies of the environment. We are concerned (a) if we do that, the results may not be generalizable to different categories of countries because of the huge difference in terms of socioeconomic development. The second concern, at the time, was with regard to the day to day, because of the funding, because of the timeline; we needed to make a study that's manageable.

We focused on children aged between 2 to 18. We also decided we only wanted to include those studies that followed the children for at least one year. And then regarding school-based study, we considered the past school year. Different countries may have different settings; in some countries, they may not be for a year, but for several months. That's why for school-based studies, we reduced it to six months.

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Data abstraction, this is a very important step. We have about 15 investigators involved. Many of them are doctoral students, residents and professors; but they work together as two teams; a junior team and a senior team. But yearly we have -- each study

will be independently reviewed by two reviewers and then they extract the data.

The junior team would do the first round of data extraction. The senior team goes through the second round, mainly for quality control. Together, reviewers also graded the strength of the evidence that's supporting the intervention for different kinds of interventions that were diet focused or physical activity focused, or they do both, for each of the settings. Probably you can imagine this is quite complicated.

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How to define the strength of the evidence. This table shows you how we defined, whether it was high, moderate, low, insufficient.

High means further research is very unlikely to change the confidence in the results, the estimate of effect. Moderate means additional studies may change the confidence in the results. Low also means further research is likely to change the confidence in the results. Insufficient is, the evidence either is unavailable or does not permit a conclusion in the results. But, in general, for this report, when we say "insufficient," that means there is not enough research.

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Meta-analysis, we only conducted a meta-analysis when there were three or more comparable studies for a given intervention or setting. Intervention would mean for diet-focused intervention, or physical activity-focused intervention, or they do both.

Here we were quite concerned if we combined all those studies, because of large variation in the measure and design may not be appropriate if you put apples and oranges together.

We used random effect models to conduct the meta-analysis. The outcome we focused on in this meta-analysis, in this report, were just body mass and BMI.

But in our unpublished results, we also used blood pressure and blood lipids. Because the study is still under review, I cannot share with you the results; but I will tell you -- I cannot show you the results, but I can share with you the results, I've done that.

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So now we may have a couple minutes for any burning questions.

MS. HORN: Thank you so much, Dr. Wang.

Yes, if you do have questions, I just remind you to use your Q&A function on your WebEx. To those who are having issues hearing the

Web conference, first off, our apologies. Second, please take a moment if you can, particularly if you're using a phone line, to mute your lines. This may help with the sound issue.

Also, if you're not hearing anything at all, try clicking on "Communicate" and clicking on the "Integrate Audio" function. If that does not work, we encourage you to follow along with the captions on the right-hand side of the screen. Otherwise, these slides will be posted online at some point in the future, so you can look forward to that as well. Again, we apologize for any technical issues.

Also, before we get started, Dr. Wang, just a quick reminder, be sure you talk into your microphone, directly into your microphone. Just getting some word that some words are getting muffled with your microphone. No worries at all, just be sure that you're speaking into the microphone.

We do have a couple of questions.

The first is, "Recent CDC data show that the number of obese and overweight children in preschool is declining. Do you see this trend continuing into the future? And what about children older than preschool aged?"

DR. WANG: Yes, I am very confident that the trend will continue based on, let's say, the national data, and especially based on the number of national initiatives. So quite a lot of resources are already invested in this effort to prevent childhood obesity.

I already showed you earlier on one slide the trends we observed, not only in preschool aged children but also in young children ages 6 to 11. Older adolescents there is not such a clear trend, but still we saw a plateau in the prevalence.

This is not a phenomenon we just observed in this space. We already observed this phenomenon in a number of other countries, in several European countries.

So the encouraging or promising message here is, if the country, the society, makes efforts, yes, we can control the obesity epidemic.

MS. HORN: Fantastic.

All right, I have another question for you: "Does physical activity interventions within school-based settings only include physical education, or does it include school-sponsored sports that require things like tryouts? In other words, a student is already interested in physical activity."

DR. WANG: Right, the quick answer is, "Yes." We have in schools, a wonderful setting that actually engages children in many different kinds of physical activities. Physical education, P.E., that's one

very important activity among children. But there are other ways that are school-based for the most part, or recess are also school-based, but also community organizations such as the Y, et cetera.

In general, for those studies that they say they want to test the physical activity intervention within school-based settings, some of the researchers, actually they are quite creative to design those intervention approaches.

MS. HORN: Great, thank you so much. I think we can continue.

DR. WANG: Okay, thank you.

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Okay, so here are some of the exciting things, the results.

We identified a large number of citations, more than 34,000, and then we found that only, let's say, 131 studies that meet our inclusion criteria. We each described 124 intervention studies; that's because there were some multiple papers that were talking about the same studies. That's why you see these two different numbers.

We found the majority of the interventions, let's say 84%, that are school-based; let's say, here, 104 studies. Although many of these school-based studies also included one of the other factors like either home or community. We also found, actually, most of these studies were conducted in the United States and in the past decade.

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Okay, this figure just shows you there is research, initially from a different database, how many citations we found, and then we found the title, and then we reviewed the abstract, and then we got the articles, and then we looked at the articles. Many of them did not meet the inclusion criteria. And then this resulted in only 131 studies which met the inclusion criteria.

And then, as earlier mentioned to you, we say we have different key questions, the settings, and that’s the results. And here it is highlighted; Key Question 1, school-based, we have more than 100 studies; Key Question 2, home-based, only 6 studies; Key Question 3, primary care-based, only 1 study; child care-based study, only 5; community-based, that’s community- and environmental-based, that's 9; and then there, are a couple of consumer health informatics studies, but they also conducted the other settings, such as school.

That's why they are, later on, grouped into the other key questions. Also, we have Key Question number 7, when we presented the report, we decided to put those studies in one of the other key questions, the other settings, which is a primary setting.

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Okay, so this slide shows you the results of a meta-analysis regarding change in body mass index between control and an intervention group. These are school-based studies. The intervention is targeted at diet and physical activity. As you can see, here are about seven studies.

Overall, we found that the intervention actually reduced children's body mass index by 0.32 points -- significant.

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The second slide shows you the change in BMI between the control and the intervention group, again, a combined diet and physical activity intervention in a school setting, but also having a component at the home. This shows the direction that such intervention will reduce BMI; however, it's not significant.

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The next few slides summarize the key findings, mainly the level of strength of evidence. This shows the strength of evidence for school-based interventions.

First, school-only-based interventions, we find that there is moderate evidence to show that school-based diet or physical activity interventions prevent obesity or overweight. For those school-based interventions that actually combined diet and physical activity interventions, the results are insufficient.

Regarding school-based interventions with a home component that has the physical activity intervention with school-based with the home component, the strength of evidence is high. Regarding those combined diet and physical activity interventions in a school setting with a home component, this is moderate.

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This shows, okay, school- and community-based regarding combined diet and physical activity intervention, the evidence is moderate. Regarding school-based, but also have a home and a community component, the evidence is high regarding the combined diet and the physical activity intervention.

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Okay, this shows for school-based interventions, whether they used a consumer health informatics component, whether it was Web-based or cell phone-based, the evidence is insufficient. Very few such studies have been conducted.

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The next key setting we focused on is home-based. The evidence is very low. One reason is because there are not so many studies conducted. The other reason is because the results are mixed. Regarding childcare-based studies, similar, a very small number -- also, the results are mixed.

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And then regarding community-based interventions with a school component that combined diet and physical activity intervention, the evidence is moderate. Regarding primary care-based interventions, insufficient, very few studies have been reported. This does not mean they may not be effective. It just means there are not enough studies conducted.

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Next, I will share with you some of unpublished results regarding the effects of the intervention on blood pressure and blood lipids. That's why I mentioned, I cannot share with you the slides, but I can tell you.

For example, we identified there are 19 studies that are comparable. They provided results regarding the change in systolic blood pressure. We found overall combined, the intervention reduced systolic blood pressure by 1.6 units, and that's significant. This intervention helped lower blood pressure among children, even though the intervention was focused on body weight. We also conducted a number of analyses to examine the effect of the intervention on blood lipids, such as LDL, HDL, total cholesterol, et cetera.

Due to the time, I could just highlight the results regarding HDL, which is the good cholesterol, it’s the higher the better. We found, actually, the intervention helped increase HDL by 1.9 units. We identified two such studies that provided such results. The two papers are under review right now.

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So in conclusion, there is a large number of intervention studies that have been conducted; but the majority, 84% are school-based, even though they also included some other components, such as home or community. And the majority were conducted in the United States, especially in the past decade.

School-based intervention programs that involve diet or physical activity intervention are effective in preventing obesity. If we

combine a home or community component with a school-based intervention, actually that works and actually sometimes shows better results.

The evidence is very limited regarding the effect of interventions in other settings, such as childcare, primary care, and policy, national policy, or regional policy, or environmental-based intervention. Those are quite limited. That's also why we recommend future research be conducted.

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In our report, we identified a number of gaps in the knowledge, which should have future research conducted. Here I will just highlight a few. For those of you who are interested I recommend you try to check out the full report, which is available online.

Here we identified future research is needed for school-based policy-based intervention, and also intervention targeting primary care or childcare. Of those interventions that use consumer health informatics, which is a very promising alternative.

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There is a lack of good understanding of the contents and challenges associated with implementing prevention programs in different settings. There is a study that just reported their results, where there were very significant changes in children's behavior or health outcomes; but they provided very limited details regarding how the intervention is implemented, what the challenges were during the process. Those results are very important to help people understand why some programs work and some programs do not work.

Some programs may not work not because of the overall design does not work, but it may be because of the way the programs are implemented. However, the literature right now has provided very limited information there. Even though, in our case, we are attempted to define some of that information, but it's quite limited.

The other gap is information on the possible various intervention in different population groups -- gender, age, ethnicity, or SES. Because different population groups may have very different environments, they may need a different kind of intervention. That's also been argued, for some interventions, if they can be better tailored to that specific population, there is a better chance they can be successful.

Another area is system science-guided intervention, because I showed you earlier many factors are involved in prevention of obesity. If people want to design effective, sustainable interventions, they need to think about the big picture -- many of the players, the factors, and then to design the intervention.

Another area where future research is needed is regarding cost-effective analysis. The challenge is usually it's very difficult for researchers to have very good data estimates regarding the cost. On the other hand, for people who conduct such meta-analysis, such information usually is not reported in the study regarding the cost.

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What to discuss with your patients and their caregivers, in particular, for physicians or other health professionals. They may talk to their patients regarding their patient's BMI and how to define or classify overweight and obesity in children. For example, they should use a BMI of 35 -- oh, use less for adults than children, especially in different outcomes. For children the CDC recommends 85th percentile for overweight, 95th percentile for obesity, but they are available at CDC Web site.

Care providers may also discuss health consequences of childhood obesity; for example, overweight children are more likely to become overweight adults. Obesity or overweight that develops at a young age have many long-term, mid-term consequences; for example, increased blood pressure; increased the risk for ischemia; increased risk in the future to develop heart disease, childhood diabetes, et cetera.

And then also talk to the patient regarding the possible factors contributing to obesity in children, mainly with how to monitor and balance problems to eat too much, do not have enough exercise. For children, they spend too much time in sedentary behavior; for example, playing video games or cell phones, et cetera.

And an unhealthy diet for them, eating too much fried food, not enough vegetables and fruit, too much sugar-sweetened beverages or for parents or teachers, inappropriate use of food as a rewards that may increase the risk for children to develop undesirable behavior, put them at risk.

Also, portion size, in general, if you go to a restaurant or at home the portions are too big, which encourages overconsumption. Also talk about the importance of monitoring total daily energy intake, as opposed to total daily food intake.

One misperception for many people is they eat a low-fat or low-sugar diet. They think that, oh, will help them to control their body weight. That may not be the case, because low-fat foods, some low-fat foods may be very high in sugar. Still, the total energy intake from a given food may be too much compared to their activity.

And then talk about the important things that can be done at home, from very small things, practical things, such as when parents prepare food, what do they put on the table. I have two young boys

in our household. When we provide the meal, we ensure we have vegetables, main dish, some meat on the table so the children will be empowered to consume those.

Some other things the parents can do with their children is to do exercise together, send them to sports, activities, et cetera. And then also tell patients, physicians, health care providers their concerns about the obesity epidemic and also take care of other patients. They will be their supporters.

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Okay, they may also discuss with the patients regarding the effectiveness of the various intervention programs we've mentioned. Also, share with them what resources may be available to help children to help maintain healthy weight.

There are quite a lot of available information now online -- the CDC Web site, the USDA Web site, on what's available in the community. And they also discuss with their patients what can be done if healthy food or a safe location for activity are not easily accessible for them.

Here are a few simple examples; they can talk to their patients, the A-B-C-D or the 5-4-3-2-1. The A-B-C-D that's how I developed as an aid. "A" means "Active," because you want to do more exercise, be active, just have an active lifestyle. "B" means you have a Balanced diet. Balanced diet means you try to eat many different kinds of foods -- vegetables, fruit, meat, it's balanced. On the other hand, it means balance energy intake with energy expenditure. If people have a relatively sedentary lifestyle, they may not need to eat so much. They need to know the limit of energy eaten.

The "C" means "Creative." Creative will have an active lifestyle or healthy diet. The "C" also means you need to be consistent. You need to keep doing it for a long period to maintain a healthy body weight. "D" means you need to do the things on a daily basis.

The 5-4-3-2-1, that's a message from the Chicago Consortium regarding childhood obesity prevention. Eat five servings of vegetables, try to eat four servings of water a day, three servings of dairy, limit the TV/screen time to less than two hours, and one hour or more of physical activity.

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This will help people have a healthy lifestyle and maintain their body weight. Now just very quickly, I want to acknowledge the key collaborators in the AHRQ project and at Hopkins. As you can see, a number of my colleagues have been contributing towards the effort. And especially I want to say thank you to Dr. Christine Chang from AHRQ, who has provided great support to this program.

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And then there are a couple of slides to highlight the other efforts. I will not be able to name each of their names because of time. However, you can see. You've got the slides. Many of them are leaders in the field at the different institutions --

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just a very helpful group of experts who have been helping us.

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This slide shows you the resources: the original report, which is available online. You can check the AHRQ Web site. There are also other things you can find there, like clinician and consumer summaries. They are also at this Web site.

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Okay, there are also many other related reports; you can find them at the Web site for those.

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Now we'll open the floor for questions or comments.

MS. HORN: Yes, thank you so much, Dr. Wang. Once again, please use your Q&A if you have any questions. I know that we've only got a minute or two for questions.

In the meantime, I can ask one from someone that just submitted prior to the Web conference. From Kristin: "What can you share about public school systems and their policies to fight childhood obesity, if anything? For example, are they consistent and/or effective?"

DR. WANG: I probably will say -- I will not say it's consistent because of the public school system in the States. There are a lot of differences between different States. Even though, on the other hand, we can say there are some nationally consistent guidelines, such as those from the USDA regarding school meals. But still, the local public school systems, they have quite different practices.

But there are lots of good examples of what they have been doing, such as there is stronger emphasis regarding providing healthy meals at the school, the different kinds of food available, such as fresh vegetables, portion size, and then there are also regulations regarding, for example, whether vending machines are allowed in elementary schools or not.

There are several States that have been having those laws to prohibit vending machines in elementary schools. And there are also other regulations regarding what kind of vending machines may be available for children or students to purchase food or certain beverages.

In terms of how effective they are, to my knowledge there is not enough good data to really show whether they are at such kind of a large regional or national level they are effective. But there are some small-scale studies that show those approaches can make a difference.

MS. HORN: Great, I think we'll just ask a couple more. "So did the studies provide an explanation of barriers for schools to implement comprehensive interventions?"

DR. WANG: Our report, we didn't provide a specific summary about that. But individual studies, the papers, some of those, they provide some discussion. For example, some studies, they argued that lack of funding is one barrier. Another one is the competitive demands for the teachers, for the principals.

In Europe, for example, academic performance probably is of more valued for the teachers, the principals, and including their own job security. In this case, healthy outcomes may become secondary. The other barrier is many public schools, especially those in low-income communities, the lack of resources and support.

I even have some direct personal experience about this. In one of my earlier studies, funded by the NIH, which was conducted in Chicago in low-income African American communities, we included, for example, four schools in the study. We identified some of the schools, even these very big schools, they have very limited physical activity treatments.

MS. HORN: Well, great. Thank you so very much. We really appreciate your time, Dr. Wang. And thank you so much to everybody who joined us today. We hope that you found this presentation informational and helpful. Again, please take a moment to complete your evaluation form once you close out of your program.

And have a wonderful afternoon. Thank you.

DR. WANG: Thank you all.