

THE BROOKINGS INSTITUTION
AN IN-DEPTH LOOK AT THE LIFETIME ECONOMIC COSTS OF OBESITY

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P R O C E E D I N G S

MR. HAMMOND: I'll call this event to order. My name is Ross Hammond. I'm the Director of the Center on Social Dynamics and Policy here at Brookings, and a Senior Fellow in Economics. And I'm going to be your MC for today's event. And it gives me great pleasure to welcome all of you, and to introduce Linda Katehi who is Chancellor of the University of California, Davis, and has been in that role since 2009. And though her background is in engineering and she holds a Doctorate in electrical engineering, Chancellor Kathy has made public health a central focus of UC Davis during her time there. And in June 2013 she helped to establish the UC Davis World Food Center who is our partner in the research you'll see presented a little bit later today. So it gives me great pleasure to welcome Chancellor Katehi to the stage.

DR. KATEHI: Thank you so much for the introduction and good afternoon to all of you. It is a wonderful to be here and participate in this very important and interesting event. Let me first applaud and thank the Brookings Institute, the Center for Social Dynamics and Policy for teaming up with our World Food Center and also with our UC President Janet Napolitano to participate in this creative forum, and to give us the opportunity to participate in the discussions today. As the Chancellor at UC Davis I'm very proud to have obesity as an important part of our studies. California, among other states, really is facing some serious issues due to obesity that we have in specifically very impoverished areas in the state, specifically in Central Valley. And of course this is not just a health issue. It is also a policy issue and we have a number of our faculty who are trying to look at obesity as an epidemic. They're trying to understand the reasons for having that in the state. And they're trying to help the state to institute policies that will help us eradicate it. When we launched the World Food Center on our campus, and that was about two years ago, we did it for two reasons. First of all, UC Davis is well known in agriculture and of course in food for the work that the Institute, the University has done for many years. And we have a number of faculty and students and researchers who are

spending their work and put their emphasis on trying to understand issues around food, including production but also food safety. And in parallel with that we have a number of efforts that look at food as part of the public health issue in California. And of course around the world, but also in policies that will improve food quality and make it available to individuals who do not necessarily have access to it. So we have a number of groups that are looking at obesity specifically that is a fairly recent phenomenon in the state. Especially in areas that are underserved. And they're trying to understand how obesity has become an epidemic in those areas, especially for individuals and families who do not have access to fresh food or high quality food. And what is interesting is that these individuals are the ones who are working in the fields. So they participate in growing food and fruits and vegetables but they do not have access to it. They have access to processed food that is high in sugar and high in fat and you see that obviously this has become an epidemic among those families and of course it has led to many health issues. And we face these issues; we see those issues, very early in life. So we try to understand it from the health side and the medical side, but also we try on the basis of the data and the research that our faculty are doing to provide evidence. So we have individuals, legislators, specifically in our state, instituting policies that will help us eradicate obesity. And so it was of course very fitting for us to participate in today's discussion and to think of the economic issues of obesity. Because we all know that obesity makes people very sick. It destroys communities in many ways and makes them less productive. And of course it has a great impact on the economies of these communities. And as we know especially in the United States, our economy is based on small and medium sized companies and in communities that are not very healthy you see much less of that and of course the economy in those areas suffers tremendously. And you see then, the impacts of that lack of health and low economies in the quality of the schools. You see it in the quality of the education that the students receive and eventually their ability to move socially upwards, which is what we as an institution are

trying to achieve in the state. So we have all reasons, at least as an institution, to make sure that we understand obesity, but also that we as a university help the state take the actions that are needed to change those conditions and to help us provide upward social mobility that has become so characteristic for UC Davis and for the UC as a whole. Before I finish, I would like also to mention that among all of the other institutions, UC Davis has done an amazing job in trying to promote education for those who cannot really have access to it. Fifty-five percent of our students at UC Davis do not pay tuition, or do not even get loans to pay tuition. These are students who come from very poor families and 45 percent are eligible for Pell grants. And many of the students are brilliant. They become very successful. They graduate on time, and then they become leaders in their own communities in the state, and of course around the world. So we want to do more of that. We want to encourage to more students to come, to have more of them from those poor families to be eligible. But I have to tell you, education and access to healthy food are absolutely critically connected. So with that I wanted to thank you for being here. Obviously the discussions today are very important to us. And I'm looking forward to hearing the results that will be presented and the discussion from the panel. So next, I would like to introduce Matt Kasman who is going to present the research that has been done in the Brookings Institute. Matt is currently doing his post doctorate work as a research associate here at the Center for Social Dynamics and Policy. He receives his Ph.D. in advanced administration and policy analysis at the Stanford University Graduate School of Education. His primary interests are school choice and student assignment. At the Center for Social Dynamics and Policy he is exploring complex and dynamic processes in public health and policy using agent based model simulations. Prior to his graduate studies in educational policy he worked in software development. So Matt, please come forward, thank you.

MR. KASMAN: Good Afternoon. My name is Matt Kasman and I'm going to present some research today that I've done in conjunction with my colleagues at

the Center on Social Dynamics and Policy here at the Brookings Institution with substantial input from Robin McKinnon. What we're looking at today is an in-depth look at the lifetime economic cost of obesity. During this presentation, first I'm going to situate our work in the broader research area of obesity, talk a little bit about we approached our research, give some of our results from the research and talk through some of the implications. So to start out, obesity is a large and increasing problem for the adult population in America. At the start of the 1990s about 10 percent overall of the adult population in America had obesity. And that's expanded to over 35 percent at the start of this decade. That translates to, in terms of total population numbers, to about 78.6 million adults. This is mirrored in the child population. There has been a similar increase, going to about 17 percent from about 5 percent and this does not seem to have dropped off at all in recent years. That translates to about 12.7 million youth who are afflicted with obesity. And this matters for three reasons. The first is morbidity. These are illnesses that are associated with obesity. These include things that I think everybody is familiar with, things like heart disease and type two diabetes, as well as some lesser-known consequences. Things like certain forms of cancer. The second reason that this matters is mortality. There is an increased risk of death that's associated with obesity. So here what we have is a graph showing an estimated relationship between body mass index and mortality. And what we're seeing is for those of the obese population, those with body mass indexes of greater than 30, there's an exponentially increasing risk of mortality with increases in body mass index. And finally we believe that there are health costs that are associated with obesity. And these health costs are felt in multiple different categories. The first is private costs, those that are borne by individuals themselves. There's the healthcare costs, directly and indirect costs such as quality of life, and lost wages. There are also public costs, those that are borne by taxpayers and private firms. And again, these are direct in terms of health care and indirect such as lost productivity. So what we would like to explore a bit today is whether there are these public costs, what

they are, how they accrue during the course of a lifetime, for individuals who are afflicted with obesity. And specifically we'd like to look at what these costs are once we've incorporated increased risk of mortality for individuals with obesity. So the way that we developed our models was first to review the literature around this topic, around causes of obesity that are borne out during a lifetime. And we decided that the best way to approach this is with a mark-up model, this is a state transition model. So this is appropriate because individuals during their lifetime transition between multiple discreet, finite, and mutually exclusive states. They can be working, they can be retired, they can be disabled, and they can be deceased. And each of these states is associated with particular costs, and particular known transitions between states. So once we designed our model we parameterized it using a very careful review of existing literature and data on the costs that are associated with each of these states and transition between states for different individuals. Specifically we first designed the model to plausible, hypothetical cohorts. Thousand person, demographically represented cohorts, taken from individuals who are currently between 20 and 24 in the U.S. census. So what we're looking at are normal weight cohorts with a BMI of about 20, and an obese cohort and we compare costs between the two during different lifespans, with the obese cohort, more likely to become deceased earlier. So it's an apples to apples comparison of costs that are translated into present cost. With our obese cohort, we ended up forming three different categories of obesity. A review of the literature indicates that obesity costs increase with an increase in obesity, an increase in BMI, similar to the graph I showed before on the relationship between BMI and increased mortality. This shows spending costs, for men localized in the work place for three different obesity categories. There was a similar graph for females, a similar relationship. We felt that a tripartite categorization of obesity was appropriate and made sense for our model. So our model is demographically representative of the current U.S. population between the ages of 20 and 24, meaning that we have a meaningful and appropriate projection out. And like I said, our obese

cohort has three categories of obesity. Grade I obesity has BMIs between 30 and 34.9, grade II obesity of BMI 35 to 39.9, and grade III obesity has greater than 40 BMI. So what this ends up looking like for our obese cohort, slightly more than half of the individuals are in obesity category one, with the rest being split between categories two and three. And this is all apportioned appropriately by race and gender. The normal cohort has a single BMI of 20.

We allow individuals to transition appropriately between states. So they can transition to deceased from any state. They cannot transition from deceased to any other state, unfortunately. My model is somewhat realistic. They can transition also to disabled and out of disabled, and from working or disabled to retired. All of our transition probabilities are taken from a careful review of existing research literature and data.

The cost categories are associated with being in each of these states are direct medical costs, these are costs of healthcare and medicine that owe to obesity. Productivity costs in two ways -- for people who are unable to get into the office who are unable to get into the office -- who are unable to work entirely -- absenteeism. And for those who are able to work but are less productive when they do so. Also costs that are associated with social security disability insurance, rising from complications directly from obesity, short term disability rising from complications due directly to obesity, and taxes forgone due to lower wages resulting from obesity. And all of these cost categories, from our estimates of the costs are taken from again, a careful review of existing literature.

The last moving part that we include in our model, is we allow BMI to fluctuate, to change for individuals who represent that in our model for these cohorts. And over time the BMI for individuals is a function of current BMI, sex, and time. The simulation software that we used to run our models was Triage Pro 2015. And in order to have a meaningful apples to apples comparison, all future costs are discounted and translated into present costs.

Following best practices in model design and deployment, we recognize that there are a number of assumptions that are implicit in the model that I just described. And so we vary these assumptions across several different model runs in order to determine whether and to what extent the choices that we made during model design drive the results that I'm going to present to you. The variations that we explored include one where we used the larger discount rate to translate future costs into present costs, one where we varied probability of transition into and out of social security disability status, and one where we varied how we characterized the mortality rates for the Hispanic segment of our cohort. So here's where we get to the results. And these results are from the primary model.

In this primary model we find that the individual costs over a lifetime for an individual with a basic cost of obesity on average is 92,235 dollars. That's the big number. Now what this number means might be little bit difficult to grasp. It might seem small or large depending on who you are, or where you're coming from. So putting it into a better context, using this estimate, if all 12.7 million U.S. youth with obesity became obese adults, the societal costs over their lifetime would exceed 1.1 trillion dollars, which is a big number no matter how you count things. So it's a good reason to care about this.

When we conducted sensitivity analyses in our models we found in general there were robust decisions that we made that we made during design phase, with very small changes and results based on how we characterized transitioning into and out of social security disability status -- or how we characterized mortality for Hispanic individuals.

Our results are somewhat sensitive to the discount rate value that we choose to employ, but in ways that we're fairly satisfied with for two reasons. The first is our selection of three percent as a discount rate was directed by guidance from OMB, so it seems like a very appropriate number to use, much more so than five percent. And second, even increasing it to very liberal high of five percent, we see a reduction in the

per individual average costs of obesity by 30 thousand dollars and roughly a little bit over 30 percent. But it doesn't bring it anywhere near zero and we aggregate across the number of individuals that still results in a very large number. So even given this change in parameterization we still have reason to care very much about the cost of obesity.

So in conclusion, the takeaway from this -- first some caveats. Although overall we're very confident in the validity of this model, a few things I'd like to note. First, whenever we review the literature on broadening costs for these different cost categories we chose conservative values. So we're likely to underestimate total costs in general, and for another other reason we only look at single cohort -- a single generation, and it's very likely the cost of obesity might compound across multiple generations.

Additionally we only included the cost categories I discussed before -- which may leave out a number of key costs, things such as increased fuel consumption, military readiness, life insurance and workers compensation. And finally we used the best available data, but it is certainly not perfect. We did not have life tables based on BMI, for the Hispanic segment of the cohort, which is why we ended up having to make certain assumptions there that we tested as I mentioned earlier. We also think we might have a slightly inexact representation of the life trajectories. We were forced to make some assumptions about the similarity of the normal rate and the obese cohort that might have affected our results, again biasing the downward value.

Some reasons that we're very happy with our ability to contribute to the literature on obesity and the cost of obesity. Because we have an estimate of societal lifetime costs of obesity, we have demographically representative cohorts of individuals -- meaning we have meaningful projection out from the current population, so how things would be in 60 years from now -- given the current youth population. We allow BMI to vary through the life of cohorts in a realistic way using a very sophisticated algorithm. And this research synthesizes a very wide body of research with a lot of different

methodology scopes and data sources into a single cohesive model that we think has very meaningful findings.

Some notes in summary -- obesity does not only impose costs on individuals -- we find that it imposes substantial costs on society as a whole. So even if the lifetime costs of obesity were able to be contained within an individual's lifetime, the increase in prevalence of obesity and the prevalence and persistence of obesity rates among youth suggest that these numbers are going to increase over time. Our model indicates increased costs of obesity are not offset by the relationship with obesity with higher mortality. That is to say that higher mortality does not offset these costs. The net of increased mortality for those with obesity -- there are still economic costs, unlike what some have hypothesized and what we might see in other contexts. And finally, focusing on mortality may obscure some issues that are related to morbidity -- sickness that might translate into spillover costs that society as a whole has to bear.

In conclusion I think what I'd like say is that even if it weren't morally incumbent to care about the life and health of our fellow citizens, our research indicates that we have a clear economic incentive to do so. Thank you very much and at this point in time I'd like to open up to the floor for audience questions. (applause) Yes.

SPEAKER: (off mic)

MR. KASMAN: That's correct. Sure, these are averages in fluctuations in BMI that we account for. We use a model -- so given a starting BMI at an age of 25, we account for natural fluctuation over one's lifetime. So it may change for someone who starts at 20 to end up being 28 or so at an age of 50 or 55. For example based on --

SPEAKER: (off mic)

MR. KASMAN: Normal, given someone's lifetime for one sex and starting BMI. Yes?

SPEAKER: Phil McGreedy from Georgetown University. I mention a couple of names, Kipp Vesgusi, how you based a statistical life. We have (inaudible)

what's the whole sum of these and how do they compare? And now Convergence 2035 by D. Jameson and people at the (inaudible) Commissions. All these sources add up the value of lives lost, which are in addition to the cost of illness approach which you present in the tradition of Dorothy Rice. These added costs associated with illness because people are dead and wish they were alive -- turn out to be very large compared to the cost of illness approach. Right now the sustainable development goals process which is ongoing is, I could call it, a race to the top. An effort to show that the intervention we have in mind is the one that will produce the most benefits relative to cost. This led us to advise U.N. AIDs for example to do much more to talk about the costs of lives lost -- not just the medical costs, not the productivity costs, but the fact that a particular 70 year old person now only lives two more years rather than eight more years. What you're doing is excellent but at least I suggest thinking about this broader context to maybe emphasize even more the gigantic costs of obesity for the United States.

One last point, David Cutler and an associate just published a piece that shows that obesity is knocking off more years of life expectancy over the last three decades than any other specific change in human behavior in the U.S.A. recently.

MR. KASMAN: Thank you, those are very valuable comments. I agree that what we're looking at here is really only part of the puzzle; it's only the tip of the iceberg. And I think what it does though, as with related research into costs associated with mortality directly, is to create real impetus and drive for seriously considering ways to prevent and treat the obesity epidemic. Yes?

SPEAKER: Bill (inaudible), GW. A very nice presentation -- I'm curious and wonder if you would expand a little bit on why your estimates are so much greater than other estimates. These are about threefold greater. And what in your model explains the differences between your assessment of costs and the previous work that's been done?

MR. KASMAN: Yeah, I think there are few reasons why. One is who we're choosing to compare. We're comparing the obese cohort to a normal cohort, so nothing in between. And the reason that we do so is first, there is greater interest in studying obese cohorts directly and the costs associated with obesity directly. Second, that's where there's the most certainty about different costs. There seems to be a little bit of controversy about how one characterized the overweight portion in between and the underweight portion below. And that would obviously be concluded by its results downward. Secondly our cost categories themselves that we choose to include here, all of which others have not done so directly.

And lastly, we do allow the realistic ability for individuals to enter SSDI category and for individuals to fluctuate BMI over their life (inaudible), and realistically (inaudible). I think all of those create the results that you're seeing that might be larger, but again we find realistic meaningful and potentially actionable.

Yes?

SPEAKER: (inaudible)

MR. KASMAN: Yeah, that is something that we included that we looked at and we tried to be as rigorous and as conservative as possible. Because lost productivity is something that is relatively difficult to direct and measure. And so we really tried to use the most conservative and so realistic estimates that were available to that and we're pretty happy with the results.

One more question in the back? If you can --

SPEAKER: (inaudible) to be blamed of the obesity epidemic. Do you think this is the responsibility of the government, of the business, or of the consumer? Who's going to put the rules on trying to give some orientation or guidance on (inaudible) what is (inaudible)?

MR. KASMAN: Yeah that's a good question. But rather than assigning blame, which I find to be both difficult to do, not within the scope of this research, and

potentially not all that productive, I think it's important to use this as a stepping off point for how much this matters, and then start looking at ways that we can start bringing these costs down. And I think that one thing that we know is that there is an increase in persistence in the obesity rates among children, and that really in my mind calls for more efforts toward prevention and treatment of obesity at an early age. And think that's where some of the next work really needs to be focused. And this draws a big underline on how important it is to do so.

SPEAKER: So in the end, the impact of the programs of the White House, the First Lady in the effort to remove the obesity.

MR. KASMAN: That is nothing that we consider in the research, nor is it something that I've directly considered. But it may be something that the panel itself talks to in a few minutes.

All right, thanks very much, this is has been a real pleasure for science research.

(applause)

I'd next like to reintroduce Dr. Ross Hammond, who is a Senior Fellow in economics studies at the Brookings Institution and Director of the Center on Social Dynamics and Policy who will lead a panel discussion on this topic.

MR. HAMMOND: If I could ask all the panelists to come up to the stage with me, all of you. So while were setting up here, I'll just say the format of the next session here is going to be a panel, in which each panelist is going to have five to seven minutes -- hopefully they'll stick close to that amount of time, to give their own viewpoints and comments both on what we just heard and on this general topic. And then I'm going to initiate a discussion with the panelists which I hope all of you will then join for another period of time and then we'll also have time for quick follow up questions based on either the research or on what the panel thinks on it.

So I'm going to begin by introducing our distinguished panelists. Sitting immediately to my left is Dr. William Dietz who is currently Director of the Redstone Global Center for Prevention and Wellness at George Washington University here in Washington D.C. He previously served for fifteen years as the Director of the Division of Nutrition, Physical Activity, and Obesity at the Centers for Disease Control and Prevention, and as a Professor of pediatrics previously at Tufts School of Medicine. He is an internationally recognized expert on obesity and a member of the prestigious Institute of Medicine. We're lucky to have him here with us.

Next in our panel is Dr. Anand Parekh, who is Deputy Assistant Secretary for Health in the United States, in the Department of Health and Services. In this role he provides oversight direction and coordination of a wide range of activities -- including many focused on public health and scientific and medical research issues. And this includes a lot of emphasis on chronic care management, disease prevention and health promotion. He has deep experience in both what you might call the nuts and bolts of policy as well as this intersection of scientific research and policy making in the arena of public health and has a lot of wisdom to offer on that space.

And finally we have Dr. Justin Trogon, who is an Associate Professor in Health Policy and Management at the University of North Carolina and the Gillings School of Global Public Health. He is a prominent health economist and has published extensively on cost evaluation as which we saw today and cost effectiveness, including leading work on the economic costs of obesity and on chronic disease prevention.

So I'll first turn to Will.

MR. DIETZ: Thank you, and thanks for these data again Matthew. I want to make my comments in three categories. The first is to comment on where we are with respect with to the epidemic, in terms of prevalence. Secondly, to talk more generally about what we know about the epidemiology of obesity and how that might

inform these data and with some comments on your presentation. And then thirdly, what the implications are of these data in terms of stigmatization of a population with obesity.

So first with respect to prevalence. There are positive signs that you can get a glimmer of in your slides. There is a plateau in the prevalence of obesity in both adults and children across all major ethnic groups. Secondly, there are decreases in the prevalence of obesity among young children in two national surveys. The first being the national health and nutrition examination survey, and the second is a survey that my division at CDC used to conduct called the Pediatric Nutrition Surveillance System.

The first of these surveys and Hanes is a representative survey of the United States. Small sample, so they're big fluctuations in prevalence but the overall trend is down. That's in two to five year old children. The Pediatric Nutrition Surveillance System is two to four year old children most of whom are enrolled in WIC, and in that survey the prevalence is decreased but not nearly as much as the prevalence has increased in the two to five year olds shown in Hanes. Those data are buttressed by data from around the country where we see in six states, and at least sixteen communities, there are decreases in the prevalence of childhood obesity. The samples vary; some of them are not particularly reliable. The ages differ from those that I just mentioned in Hanes and Petnus. But they're down. And I think all of these trends are positive. And the fact that there's a plateau in the adult population is also encouraging. We haven't yet turned the corner.

And it's worthwhile asking as the question from the back did -- what accounts for these changes. Well there have been major changes in food consumption at the national level. Decreases in fast food, decreases in sugared drinks, decreases in pizza. All of which add incrementally to the daily caloric intake when those foods are consumed. In addition we know that the caloric gap in young children -- the gap necessary, the daily caloric gap necessarily to return children to where they were in the

1970s is very small. It's 30 calories a day -- a daily caloric gap that by 2020, will return those children to the mean BMI, back to where it was.

Now the costs argument is a really important argument. And we -- Justin and I were coauthors with Eric Finkelstein and released some data at the Weight of the Nation Conference in 2009, showing that these costs accounted for about 147 billion dollars a year, a substantial increase in costs that was attributable not to changes in prevalence, but not to changes in the cost per capita.

And the limitations of that survey was that we did not stratify by severity, which is a significant variable and there was a paper by Arterburn which suggested that eight percent of the population -- the adult population accounted for 40 percent of the costs of obesity. And those were limited to people with BMIs over 35 which are going to have an increased prevalence of all the diseases which Matt showed. We did not consider children. And children are a difficult group to study because the natural history from childhood to adulthood is really uncertain. And we also did not include presenteeism, and as you correctly pointed out presenteeism is the most difficult thing to estimate.

One of the things I don't think you included, if I understood your data correctly, was the social costs of obesity which are directly attributable to stigmatization. So we know that college acceptance rates among people with obesity are decreased. We know that -- and as a result that has a long term impact on wages. We know that marital rates for women with obesity, at least used to be decreased, meaning that income was comparatively affected.

These social costs I think are even more painful in many respects because they are so personalized than medical costs. So I would love to see your data because your estimates are so much greater than those that have been published. It would be useful to see your data and look at the percent differences by category -- by those five or six categories, compared to other estimates. Because I think that would

reassure people that your data -- I know that you asserted that your data were valid. But it would be useful to see that comparison because I think it would be compelling and tend to focus more attention on what the specific contributions of those costs were.

The absence of long term data is obviously a problem. We don't have great longitudinal data from either children or adults. And equally important the implications of your data are that, well if people lose weight then some of those costs will go away. And what we desperately need in this field are changed change analyses. Changes in weight -- up or down associated with changes in costs -- up or down.

And the final point is there is such bias and stigmatization associated with obesity that I think how these costs are presented to the public is a critical concern. Because it may lead to increased stigmatization. It may lead to increased discrimination in the work place. And we can't afford to add to the already extensive burden that people with obesity are suffering.

So the one final point I'd like to make is that that stigmatization begins with language we use. For years I described people with obesity as obese people. That's an identity. People with obesity are people with a disease. And I think that has political implications as well as implications for respect. Because people with obesity are seen to be less responsible for their disease, than obese people are seen to be responsible for and identified with that syndrome.

MR. HAMMOND: Thank you very much. Anand?

MR. PAREKH: Right. Let me first thank Brookings for hosting this very important panel. I'm very happy to be here representing Health and Human services. I want to start by thanking Matthew for presenting your model which I think takes into account the costs of obesity beyond direct medical costs, and I think from my perspective should provide even more urgency to various sectors beyond health, in tackling obesity -- employers.

I'm not an economist, but a physician who is taking care of patients with obesity and obesity related health conditions, as well as a public health policy maker who has tried to support environmental interventions to help communities tackle obesity.

Today I'll stick with what I know best which is the health side and I want to very quickly communicate four categories of activities that the U.S. Department of Health and Human Services is engaged in to address obesity. Now broadly speaking, the department is engaged in quite a bit, from research to surveillance to regulatory activities. I want to stick to four.

So the first -- HHS agencies play a critical role in fostering public private partnerships to address obesity. And probably the most visible one was just mentioned in the question and answer -- which is the First Lady's Let's Move Initiative, which is essentially is built on the premise that everyone has a role to play in reducing childhood obesity. And perhaps this will be one of the themes of the forum today, sort of the shared responsibility that multiple sectors have in tackling obesity, particularly given the economic costs.

So HHS is playing a key role in the First Lady's Let's Move Initiative, working with partners such as schools and childcare facilities and local elected officials. For example there are now 15 thousand schools across the country committed to helping students get physical activity every day. We're approaching five hundred jurisdictions in this country where local elected officials have signed on to meet best practices in improving nutrition, healthy weight, and physical activity.

Second, HHS tries to work with communities to implement environmental changes that improve healthy behaviors. So for example in 2014 CDC awarded approximately 50 million dollars in partnerships to improve public health grants, or pitch grants, to improve the health of communities and reduce the prevalence of chronic disease. This investment builds on previous evidence based programs to increase access to nutritious foods and physical activity opportunities. And there are many

evidence based ways to do this, whether it's increasing healthy offerings at corner stores, establishing farmer's markets, ensuring vending machines are healthy, increasing physical activity in schools, urban design, there are a wide variety of evidence based interventions that communities have used. In fact CDC did a modeling study of a previous CDC program, using Prism, one of their modeling tools and was able to show that if communities in that program sustained their initial set of evidence based interventions through the rest of the decade there would be a substantial reduction not only in mortality but also in health care costs averted. So I think systems and environmental changes in a community can make a large difference when we talk about tackling obesity.

Third, HHS understands the importance of working with the clinical care community. In fact, 90 percent of our budget at the department goes to expenditures from the Medicare and the Medicaid program. As of just a couple years ago Medicare actually now covers an obesity screening and counseling benefit for beneficiaries, free of charge. And I think this is particularly important of course for first and foremost to improve health but also potentially to reduce medical costs. There's a very nice study that came out of Rand back in 2008 where they used the future elderly model. And found that of all the potential ways to improve health for our elderly population, one way to do so while potentially also reducing Medicare expenditures, is to reduce obesity. And it's essentially because of the high costs of obesity related disability and the fact that obesity at that age in and of its self does not seem to affect longevity or did not, using that model.

Fourth, HHS disseminates information on obesity to the public and stakeholders in a variety of ways. I think many of you know in 2008 HHS published the first physical activity guidelines for Americans to help individuals improve their health with regular physical activity. Later this year HHS and USDA, there may be colleagues from USDA here today, will release the 2015 dietary guidelines for Americans. Through regulatory activities HHS is increasing transparency for consumers so they know more

about the foods they're eating. For example, there are new requirements now for calorie labeling in chain restaurants and for vending machines. HHS is also trying to incentivize consumers through recognition programs such as the Presidential Youth Fitness Test. You might remember that test from when you were back in school. It's changed now, so you don't have to be an athlete to get an award. And the Presidential Active Lifestyle Achievement Award.

So this is just a snapshot I think of some of the activities geared towards reducing the prevalence and instances of obesity. I think what we're trying to do to reduce obesity related complications. Yet I think we welcome today's discussion as it demonstrates the importance of obesity from a cost perspective goes beyond just what we talk about at HHS as direct medical costs. But it's even broader and we need more sectors involved, so thank you for including us.

MR. TROGDEN: All right, well again, thank you for the invitation to participate. I really enjoyed the paper Matthew. I'm going to have a couple comments focused on essentially measurements or how economists sort of get at these costs that were at the base of the Markov model. And then I'll venture into some economic related sort of policy recommendations. It'll be totally my own opinion at that point. But, so the first thing I wanted to mention is that, and I think it has already been noted that one of the good things about, one of the things I liked about the paper was the breadth of economic costs that we included, beyond just direct medical. We have a lot of data on direct medical costs and so that's where a lot of the published research is focused. But the indirect costs are often very important, not only for the individuals themselves, but also for their employees. And as you, as we saw, presenteeism in particular is a big part of those indirect costs and they often can dominate overall cost estimates. So I agree with Bill, I'd be interested to see the costs broken out and stratified. But one of the reasons that presenteeism is so tricky; there's not a lot of literature on it. I want to talk a little bit about how we get at it.

It's often very task specific. So some of the earliest studies were at call centers, and it looked at how many fewer calls a person was able to place, in a given amount of time. And they stratified that by weight. There are some more general surveys out there, but they're very subjective in the sense that they're asking people to ask people to think about a hypothetical in their mind about how more productive they would've been if they felt better, which is not something that maybe we can do all that consistently.

There are other ways that economists have tried to answer questions like this. If labor markets are competitive then we think that wages are supposed to be somewhat closely related to the value of a marginal product, or the value of the extra goods are producing. Outside of things like stigma and discrimination in the labor markets, that might be a good proxy for wage differentials, might be proxying for difference in productivity for instance while at work. But again careful consideration has to be taken into account for the fact that there might be discrimination in the labor market. So it's a very challenging thing and again I think it's an area that needs a lot of work because I often see it dominating overall cost estimates.

The second thing I wanted to talk about, and Bill sort of stole my thunder on this one a little bit, but.

MR. DIETZ: Apologize.

MR. TROGDON: We definitely need more longitudinal studies, so the model we saw presented today is an excellent attempt to take essentially cross sectional data. So data that we have observed at one point in time, and stretch that out and make that truly dynamic. And it would be great to have more actual dynamic data. And one reason that, the main reason that that's important, is, we really need to know, are these costs reversible?

So if we took someone who was struggling with obesity and was able to lower their weight back into the normal range, what would happen to their costs? And

what we have in the data right now, the way we generate these estimates is we basically compare costs, taking out medical costs or absenteeism. We just compare, what are the rates among people that are struggling with obesity, and what are the rates among people with normal weight. And those differences are attributed to obesity. But there are lots of other things that we don't observe about that are potentially different between those two groups. From other unobserved health status, we know obesity is correlated with a lot of different health outcomes. We also know that health outcomes impact the ability to be physically active, which again can lead to obesity, so there's a little bit of a jumble. And then there are things that economists think about like the rate of time preference. So am I someone who's thinking about the future a lot or am I very present oriented? And those things we often don't observe.

So having observable longitudinal data where we see people changing weight and we track the changes in these cost categories would be a big step forward in the literature. I'm going to use that as a springboard to my third comment, which is this is really important depending on the perspective you take, because the timing of the costs really matter when you're trying to make the case for action on obesity. So in some of the work that we've done looking at lifetime obesity costs in a much less sophisticated way, what we found for medical costs is that the biggest cost actually occurred around ages 60 to 65.

So until that point, the costs are, especially in younger ages, really aren't that high. It takes a while for -- these are chronic conditions so they build up over time. And so what that means from a policy, or if you're trying to sell a program, Medicare might be much more motivated by these numbers than a tech employer that has an average age employee of 28. And so the other thing I'd like to see broken out, I'd like to see some trajectories in your model, just to see if the timing of when the costs are the most important, is it at that sort of Medicare entry age, or can we tell a story at younger ages. And especially if you're thinking about, trying again, using these models to sort of sell

policy. I've always warned people, I'm in the school of public health now, I've always warned people about focusing too much on cost savings. So these obesity costs are large, but we also know that obesity is a very tricky thing to turn around, especially at a broad population level. So we don't have good sense about how much money it might take to actually make the change.

And so by setting up an expectation of a positive return on investment or a cost saving from obesity interventions, we're often setting a very high bar to meet, that frankly very few prevention public health efforts meet that bar. I could probably count them on one hand. So I don't think we should be setting that bar. I think we should be talking about value for the money we're spending and the improvements in health that come with that value.

MR. HAMMOND: Thank you, excellent comments from everyone. I have a couple of thoughts just to kick off the discussion before we open it up to our audience. Bill, I was struck by one of the things that you were saying, it was implicit in what you were saying about stigma and the role of social costs, which is really about disparities and the way in which social costs and stigmatization open up disparities in our society, and I have also been struck by the recent evidence of a plateauing and in some cases a downward, start of a downward trend in obesity, in particularly in children. But I'm also aware of some evidence that with that flattening or downward trend are actually increasing disparities that are masked by those population averages. And we've certainly come from a history where obesity was really a problem focused in minority groups, and to a situation now where it's a very widespread problem in all of the US. And I wonder if you could comment a bit on how you see the importance of a focus on disparities as we tackle this?

MR. DIETZ: Yeah, thanks for that question. I neglected to mention that. In those communities in which there have been decreases in the prevalence of childhood obesity, the decreases have been much greater in the white population than in the

African-American or Hispanic population, with one exception and that's Philadelphia. And the reasons for why Philadelphia differs are unclear. But those disparities are very significant, and particularly among African-American women, where there's a disproportionate prevalence of severe obesity. But one of the cautions there is that this does not appear to be socioeconomic in character, that across the three major socioeconomic categories, the prevalence of obesity is flat.

So I think there's been this confusion of poverty with severity and prevalence. And the approaches would be much different for a culturally based obesity than they would be for one determined by poverty. The other thing, and I defer to you to talk about Let's Move, but I wanted to make another point about Let's Move. When, in 2009 the White House convened a task force on childhood obesity, and when you go back and look at the recommendations of that task force and match those to the policy initiatives that this administrative has introduced, there's a one to one relationship. So one focus was early care and education, well the child and adult care food program is now under review and recommendations are either -- you would know better than I when they're going to be forthcoming.

The Healthy Hunger Free Kids Act changed the foods in schools, along with the competitive foods policy. In strategies directed at parents, many labeling and now changes in the nutrition facts panel are designed to give parents more information. And the negotiations with industry by the White House and the Let's Move Initiative produced the Healthy Weight Commitment Foundation, which lowered 6.5 trillion calories in the U.S. diet, or about 80 calories per person. And those contribute to the declines that we're seeing. So I think the contribution of the First Lady has been profound.

MR. HAMMOND: So that actually brings me to the question I had for you which is I was really struck in your remarks by this, in addition to highlighting all the wonderful things that the HHS and at the federal level that are going on to help combat obesity by your sense of shared responsibility, in the sense that everyone has a role to

play in combatting obesity. And a lot of the work that we do here at my center is actually focused on system change and sort of whole of community efforts to address obesity at lower levels of scale as well as at the federal level. And I wonder if you could tell us a bit more about how HHS, which I know is doing this is, in addition to directly intervening, is serving sort of as a catalyst and a facilitator for these efforts, bottom up efforts, in many cases in communities.

MR. PAREKH: I think one of the sayings you hear a lot is we need to tackle this problem where people live, where they learn, where they work, where they pray, and where they play. And essentially saying that, you realize you got to get to where everybody is, and there are multiple sectors other than the clinical setting for example to really tackle obesity. And I think that's what the First Lady's initiative has done. A lot of our work at many of our agencies, the CDC and others, have been trying to get faith based leaders, trying to get employers, trying to get schools, child care facilities, and say that we all have a role here. And I think some of these examples, the Let's Move Initiative that I mentioned, you know 50,000 schools now, it's extremely impressive, 500 local elected officials, like mayors, essentially saying that we're going to report on a regular basis all the systems and environmental changes that we're in. And this is both sides of the aisle. So we're seeing Republicans as well as Democrats, close to 500 jurisdictions across the country.

So I think people are beginning to understand that everyone has a role here, and I think that's what HHS has been trying to do to help people understand what their potential roles could be.

MR. HAMMOND: So Justin, in your remarks I was struck by your emphasis on some of the kinds of data that we really need, and what implicitly the implications are for future research in this space. And in my view one of the most important things that models, such as the one presented today, can do is to help highlight what the most important data gaps and needs really are. And you spoke very eloquently

to the importance of longitudinal studies. I wonder if you, if from your experience could talk a bit about the importance and the difficulty in getting data on some of these other categories of costs that we actually were forced to omit from our research because there's inadequate data, things like transportation costs associated with obesity, things like infrastructure costs that are being incurred by the revamping of infrastructure to handle a heavier population and things like military readiness costs.

MR. TROGDON: I think some of it is just the data sources, so you know the first place we go for, when we start thinking about a problem like this is usually nationally collected surveys and then administrative data. So for medical costs for instance we have the medical expenditure panel survey and on the medical claims side we have Medicare, Medicaid claims data, and if you're lucky enough you might have access to private insurance claims data with obesity in it.

So those are sort of like the first line. Once you get out into these more contextual types of things, I think of it really as just a data collection issue. So in some of the work we've done with CDC, we're starting to push out some of the community initiatives. It was a lot of work to try to get a sense of how to quantify the environment that people are working in. So if you think about fuel costs you'll need to know how walkable versus drivable is a city. So there are some sources, we use the walk score website to try getting some of that. So there are some there, but at that point you're really sampling -- it's a mixture of sort of convenient sampling and then being very forward thinking when you prospectively design evaluations to be able to get the data you want. And what you have to be cognizant of is the representational-ness of the data. Is it representative of the community that you're after? Often data like this is, especially if they're convenient samples, may only represent a small subset of higher income, mostly white working people for instance.

So those are the real caveats. But my hope is that sort of as, sort of quantified self becomes a thing, and then maybe we can have quantified communities,

where you know it's actually just kind of out in the ether, and it's easier for us to pull into models like this.

MR. HAMMOND: So my final question that anyone in the panel can jump on is, is we have people on this panel who have played in an important role in policy making in government, people who are doing leading research, and people who have worn both hats at different times. And I'm curious if any of you can comment for a minute on the importance that research, particularly this kind of research that we're talking about today can play as an input into decision making and policy making. And in the reverse direction, the importance of in many cases federally funded data sets as an input into the kind of research that we really need. Do any of you want to speak to either of those thoughts?

MR. TROGDON: That's an intimidating question. Well I think research has to underpin these decisions. And to me one of the great concerns is that in the public discussion we've replaced science with belief. And I don't know, I think that depending on what your politics are, or your politics may determine your response to this paper. You know you either embrace it or you dispute it depending on what your perspective is. But I don't think that that should suggest that we stop the research. It just means we need to refine it and deliver it in a package that people can understand and can accept.

MR. PAREKH: I think I'll take the first question. I think this research is really important and I was struck by both absenteeism and presenteeism data from the model. And then I sort of think of (inaudible). Wellness is now an eight billion dollar industry in and of itself. I think it's important not to just look at cost savings, I totally agree, value is more important. But I think research like this again, helps make the point that to really tackle obesity you need multiple stakeholders. And I think that's what we're doing here, going beyond (inaudible). So I think research like this is enormously important.

MR. HAMMOND: Anything else?

MR. KASMAN: Well yes, again as a researcher I definitely think it's valuable. The question you asked me I think was -- you know we talked about data and so data is extremely important. We don't know if what we're doing is working unless we have that information. Some of that is -- we can get through ongoing surveys; some of it will be specialized to particular evaluations of policy. And again I would love to see an increased focus on value for what we're doing. I think across the administration there's definitely been an embracing compared to effectiveness. And so to think about what that could look like for obesity prevention at a community level is a good place to go.

MR. HAMMOND: Let's see if our audience wants to join in this discussion. Do we have questions from the audience? If you do I would ask you to use one the microphones so everyone can hear it, and this event is also being webcast so I want to make sure our viewers who are far away can hear the question as well as the answer. Question in the back, for our panel?

SPEAKER: Todd Wiggins. My question is do you have any evidence or testimonials from some of the participants in the Let's Move Campaign or anyone in general who can speak to this administration's efforts to make more people more aware of the concerns that you've expressed today?

MR. PAREKH: I think so. We can certainly get that to you in some form or fashion. We have individuals at Health and Human Services or at other departments who are working with Let's Move sub-initiatives. There are 10, I believe, sub-initiatives all trying to tackle different sectors -- childcare, schools, and so there's actually quite a bit of information we'd be happy to share with you of what's available. Yes, right here.

SPEAKER: My question for the panel is anyone from the food industry, and my question is, and it's an unfair one -- to what extent can you envision in the immediate future the food industry willingly partnering with government and various

campaigns as opposed to being lone wolves and doing things on their own, having to be shoved into doing things?

MR. DIETZ: I think we're already seeing some of that. And there are a couple different sources of evidence. The Healthy Weight Commitment Foundation is the most notable and most visible. And the companies that participated in the Healthy Weight Commitment Foundation provided 25 percent of calories in the U.S. diet, so their reductions are not a trivial matter. The second source of information is some of the work that Hank Cardello has done at the Hudson Institute. And he's shown in several different studies that the companies are -- the sales of more healthful products, both in the market place and in restaurants, are increasing more rapidly than the less healthy products. And that in part I think reflects consumer demand and in part it reflects skating to where the puck will be as Wayne Gretzky used to say.

I think that these trends are real, and whether they can be sustained and whether they can be accomplished at cost, not increased cost, remains to be seen. But I'm encouraged by industry's response.

SPEAKER: Discussing a little bit more, I'm sorry, Nate Mann with the Washington Times, talking a little bit more about these market demands for the more healthy foods, the growth of the more healthy sections of the food industry, do we think these market demands -- and this is for the entire panel, are the result of the kinds of programs envisioned by the Just Move campaign and some of the others done by the HHS? Or where do we think that market push is really coming from? Can we attribute that to these education programs?

MR. PAREKH: I think it's hard to pinpoint sort of what might be driving consumer demand here, but I think education helps, education will always help. I think more awareness, visible programs help as well. I think multi-sector partnerships help. I think frankly healthy food to a certain extent is getting more palatable, I think that helps as well. There are choices. I think choice makes a difference too. If you can't find any

healthy food, but if your corner store now has healthy food, I think that matters. We still have a ways to go. In a vending machine if you a salad, you're like, great. But if it's four dollars, and the candy bar is one dollar, then we still haven't gotten where we need to be. So I think there are a lot of things but I do agree that I think that this consumer demand will continue to increase. Industry will have to be responsive to that. I think we have to work with industry. And I think they want to do the right thing as well as this being, in the end, in their economic interests to do as well.

MR. DIETZ: I also think that the other contribution that you mentioned, of the First Lady, was to increase awareness of this epidemic in a way that our work at CDC did not do in terms of the general public. I think that our work was shared widely among elites -- medical groups, public health groups, some industry. But I think the great contribution of the First Lady was to personalize it, and increase awareness. And like tobacco, where plateau in tobacco consumption began before any policy initiatives kicked in, I think what we're seeing in terms of the changes in diet is a consequence of awareness.

MR. HAMMOND: Questions from the audience, for any of our -- one in the back there?

SPEAKER: We focus a lot on the food element. I'm Bill Salez. I'm with the Sports and Fitness Industry Association, so you know where I'm going here. (laughter) We focus a lot on the food element, and the diet side. Have you seen changes in the physical activity side with the reduction in obesity, or are there policies out there, anything that you have seen that will encourage people to change their healthy behavior on the activities side, because that's the other side of the healthy lifestyle?

MR. DIETZ: Well I wish I could say yes, but I think that physical activity is where we're failing, that schools have not re-introduced a physical education that kids are, I think overall less active. And it's true that the inactivity undoubtedly contributed to the epidemic. The other thing that would be interesting in your model would be to factor

in physical activity, because physical activity is going to reduce costs without changing body weight. Just in terms of its impact on co-morbidities. So we ought to be promoting physical activity both for prevention and for the reduction of risk among people with obesity.

SPEAKER: Christine Petrine from George Washington University. So you've talked about how these data could incentivize employers, parents, as well as schools to address obesity. But I'm wondering how you can incentivize providers in their practices through policy recommendations and could we draw from the data presented here or other data or missing data that would help in the response to the obesity epidemic.

MR. HAMMOND: The presentation today is really about assessing what the economic costs are and it stops short of prescribing any particular policy implication of what those costs mean. And it certainly doesn't evaluate any particular policy that might be put into place in the real world. And the focus really is on the costs today, although I hear a hunger in the audience for an emphasis on solutions and that's actually where a lot of our research is, and where we are planning a future event on that, so stay tuned. That said, I bet that some of our panel do have some thoughts on the medical care side.

MR. DIETZ: Well I'm going to recuse myself, because Christine works with me.

MR. HAMMOND: Oh okay.

MR. PAREKH: Well you know healthcare is transforming. The healthcare environment value is sort of the big word. How do you improve outcomes while reducing preventable healthcare costs? And I think there's far more accountability now for healthcare providers to really improve outcomes and to reduce costs. And the passive insurers are now -- more and more providers are at risk for doing so I think that given the impact of obesity on chronic conditions in this country, which is really the

number one cause of mortality and morbidity, and healthcare costs, I think there is certainly a prerogative and an incentive for clinicians there.

Certainly by having screening and counseling services now covered and paid for by payers, also provides financial incentives to do what they would want to do anyhow. But this certainly helps. So I think there are some payment changes, there are changes. There are new payment models and delivery models and alternative payment models again focusing on health outcomes. And so I think that will also push clinicians towards tackling some of these complex topics like obesity and ultimately in the way you deal with chronic disease risk factors -- you see a patient they're in your office for 50 minutes. But 99.9 percent of the time they're in their homes and in their communities. That's really through clinical community linkages. And I think with this increased accountability of healthcare for outcomes, providers are going to have to partner with community entities to try to tackle chronic disease risk factors -- which are really escalating costs and the reason why we're not seeing the outcomes we want to see.

So I think this is happening. I think it's going to happen more, and I think there are probably multiple incentives for providers to get more and more.

MR. HAMMOND: We have time for one more question if there is one for our panelists. One over here.

SPEAKER: This is a question for Dr. Dietz. My name is Todd Post. I'm with Bread for the World. And I'm very much concerned about the interaction between food and security. Talk about the obese population as if it's a (inaudible) obese is poor, but if you're poor -- solutions and policy recommendations. But it does change the way in which we approach the issue. Maybe reflect on that?

MR. DIETZ: Right, so when I was still in Boston seeing patients I had a patient whose family was food insecure and their daughter had significant obesity. And in that family the issue was that was by the end of the month they had run out of money and so they were feeding their daughter just high caloric density foods. And I believe, and

that tipped me off to this relationship between food insecurity and obesity. And I think it's real although the literature is contradictory on that topic.

And I think the issue of how one structures food programs to meet that need is equally controversial. And we know that there have been efforts to remove sugar drinks for example from the SNAP food package. The argument there, that I would make is that if we're going to remove sugar drinks from everybody that gets federal benefits then federal employees should be banned from consuming sugar drinks or purchasing them. Because our salary comes from taxes. And it is discriminatory in that respect.

I think the WIC -- changes in the WIC packages are an extraordinarily positive move. It's unclear to what extent that may have contributed to the declines that we're seeing in children. But it's an enormously complex issue and what we tend to think about when we think about food insecurity is, we think about minority populations by and large. But we forget that those minority populations live in neighborhoods in which they don't have access to healthful foods. They don't have choices to make. They're surrounded by corner stores and fast food emporiums. But I think you have your finger on a critical issue and that is, as we think about this problem we need to think broadly in terms of food systems. And how people are affected by food systems, and that applies not only to the poor but it also applies to the general population because we import most of our -- the majority of our food and a substantial proportion of our vegetables. And our agricultural policy promotes the subsidies for crops largely to feed animals. What's wrong with that system? We're not self-sufficient in terms of food. It's not just the poor that we have this challenge with -- how do we restructure the food system so that we address all Americans? And provide healthier alternatives and food security as a nation -- because I think that we are food insecure as a nation.

MR. HAMMOND: Good, well I think on that note, we'll close the panel. I'd like you to join me in thanking our distinguished panel, for their contributions. And if you want to sit down again --

(applause)

MR. HAMMOND: Janet Napolitano is President of the University of California system, covering ten campuses, five medical centers, three affiliated national laboratories and a state-wide agricultural and natural resources program. She has previously served as Secretary of Homeland Security in the Obama administration as Democratic Governor of Arizona and as Arizona Attorney General. Her current position as you see, President and her extensive experience in politics give her a unique vantage point and she, I hope will be able to speak to the ways in which quality research can and should inform policies. Thank you very much and welcome.

(applause)

MS. NAPOLITANO: Well thank you. It's a pleasure to back in Washington and a pleasure to be able to think about leaving Washington. (laughter) But it's also a pleasure to be here at Brookings, whose work I've long respected in a whole host of areas. And I'd like to begin by just saying how appreciative I am about the topics that are being covered today and the research that is being shared today. Because I think that, as the research findings make very very clear, the lifetime costs of obesity are sobering to say the least, and have all sorts of societal impacts. So we can think of those costs as costs or we can think of them as some sort of a clarion call to action. But we shouldn't just sit back and say well isn't that interesting and go home. There's just too much work to be done.

There are 12.7 million children with obesity in this country. They grow up to become adults with obesity which most of them will. They will incur costs in the hundreds of billions of dollars over the course of their adult lives. Their overall health will suffer, the quality of their lives will be effected. So there's a lot to be done on the public policy and public health fronts to manage successfully an issue like obesity in the United States. Doing this requires collaboration and cooperation, among and between federal and state governments -- medical centers and public health boards and a wide range of

public entities and private organizations, including as someone mentioned in a question at the last panel -- the food industry itself.

So today I would like to submit that public research universities like the University of California can and will help lead the way as we grapple with this complex and considerable challenge. I think earlier this afternoon -- I think I see her, you see Chancellor Linda Katehi -- spoke about the World Food Center on the UC Davis campus and its efforts to combat obesity and to enhance and expand research in food nutrition and public health. The World Food Center at Davis in fact is a model for research endeavors in this arena and it is just one example of what the University of California as a whole is doing to tackle obesity and other issues involved in what we would describe as the broader category of food.

The University of California is ten campuses strong. When you add in UC's five medical centers, three affiliated national laboratories and its statewide agricultural and natural resources program -- the scope and strength of what the UC does is quite impressive. So when you think of the World Food Center, multiply its efforts by a power of ten, at least ten. And you will begin to get a sense of what kind of impact an institution like the University of California can have when it comes to contending with major global challenges like food.

Just about a year ago the chancellors of the UC campuses, the ten chancellors and myself were having dinner. And we were discussing what are some of the world's major problems that we collectively could take on. Where were we uniquely positioned, where did we have particular expertise, where was there great interest by our students and by our faculty? And we selected the issue of food. And hence was born the University of California's Global Food Initiative.

We were inspired to pick this -- and we could have picked several other topics, some involved in sustainability issues like water and energy. Those are not totally divorced from food but they have other impacts as well. We could have chosen

something like global security. But we chose food because we could see that by the year 2025, ten years from now, there will be approximately a billion more people who live on this planet which is already stressed. As we gather this afternoon, a billion or so people that we share the planet with suffer from chronic hunger or serious micro-nutrition deficiencies. Another one half billion primarily in the industrialized nations of the world, like the United States, suffer from obesity. So you put that on top of increasing pressure on our natural resources, our land and our water, and in California we're particularly concerned about water, and you can begin to see why we put this in the context of a global food initiative.

So the initiative is designed to focus on one central mission point. And that is to put the world on a pathway to feed itself in ways that is nutritious and sustainable. Nutritious -- that goes to what exactly are the foods that we eat and that are provided for consumption, and sustainable -- meaning how do we do this on a planet that is suffering from climate change, that is suffering from water shortages, water overabundance in some areas and the like.

And this is the kind of challenge that a public research university -- situated in one of the most robust agricultural regions of the world is ideally positioned to make a positive contribution. The University of California actually possesses two missions that are instrumental to making this difference. The first is -- as a public university it has a public service mission. The export of knowledge is not only UC's stock and trade; it is also one of our key values -- a moral imperative as it were. And UC's public service is not confined to things within state borders. As we develop best practices and discover new findings, we want to push ideas and practices out so that they can be replicated and implicated at other institutions, whether in higher education or otherwise, whether in California, in the United States, or around the world.

The second fundamental mission we have is the research mission. The balancing act between basic research and applied research is one that we at the

university do every day. And that research reaches across a wide ranging spectrum, particularly when it comes to an issue like food. I'll give you an example -- the Darfur stove. This was actually invented by scientists at Lawrence-Berkeley National Laboratory. The Darfur stove -- it's about this big -- is not only fuel efficient, but it has been revolutionary in real life application. It allows, and was designed for women who are in the refugee camps, in the Dafuri region so that they could cook the evening meal for their families without having to range far and wide to get the wood to fuel their stoves. And the farther they went from home or from their camp, the more dangerous it was for them. And scientists at LBNL working with students at Berkeley designed the stove and the stove is now in use in populations not only in Darfur, but in other third world countries around the world.

Another example, the preservation of small scale artisanal fisheries in the developing world. At UC San Diego students and researchers are working with community and government agencies around the globe to help preserve these smaller fisheries, and the food security that they provide for local populations. The research is critical. Over fishing, reef damage, and invasive species all threaten the sustenance of the roughly 150 million people who depend on these smaller fisheries for protein and for income.

Another example is UCLA, a research being conducted at UCLA. On that campus Dr. Wendy Schlessler is leading on the way on lowering the risk of low income, preschool aged, Latino children from becoming overweight. She is an expert of pediatric obesity and through her research she has helped create parent training classes, and we just heard again in the earlier panel about the necessity for that interaction with the families, with the parents -- her expertise is key, because as we have seen and the research shows that Latinos are among the groups with the highest risk of childhood obesity as well as diabetes and hypertension.

And our research is not confined just to faculty members, but on priming the pipeline of new knowledge that begins with students in their college years. Both undergraduate and graduate students play an important role in combatting big challenges and participating in fact in the global food initiative. So I'd like to describe a few of those students with you this afternoon.

The first is Alberto Aguilera. He is a graduate student in nutritional biology at UC Davis. His research is dedicated to a singular objective -- preventing obesity among the young children of Mexican migrant workers in the Central Valley of California. He used to be one of those children. He grew up in the Central Valley. His mother and his grandmother worked in the fields and in food processing plants. He says he was inspired to pursue his research, because "I know from my own experience the struggles this community has with obesity, I know," he says "how it one of the more preventable conditions people face." He notes that little research so far has focused on this migrant family population. So he's doing his part to fix that through a study of farm worker children.

One technique he is exploring is the use of new scanner technology to measure whether these children are increasing their vegetable and fruit consumption -- by running the scanner -- this particular type of scanner over their hands -- Alberto can calculate the amount of chemicals from fruits and especially vegetables in the skin. The higher the reading the more the consumption of fruits and vegetables. He's using this data to develop a nutrition report card, that can then be provided to parents -- giving them personalized feedback on their children's fruit and vegetable intake.

Alberto and his colleagues also distribute monthly produce vouchers to the families participating in the study. And they're working to recreate traditional Mexican food recipes with a greater emphasis on nutritional value.

Another UC graduate student is exploring this topic from a different angle. Student's name is Jonathan Shore. He's a medical student at UC San Francisco.

He is focused on developing techniques for self-monitoring eating habits and physical activity levels. I met him a few weeks ago in Del Rey, California, where we were having a gathering of all the Food Fellows from the UC. As part of our global food initiative we've actually funded students who are known as Food Fellows at each of the campuses of the university and we've brought them all together at the farm of a gentleman named Mas Matsumoto. Mas grows sun crest peaches. And by the way if you ever have the chance to eat one of those peaches, it will be the best peach you will ever eat anywhere.

But in the yard of his home out there, in the valley under the shade of a large Sycamore tree, Jonathan told me and his colleagues that for him the watershed moment for his research was sparked by a rite of passage for many young adults. He had to learn how to cook for himself on a daily basis. Remember those days? He wanted to make sure he didn't develop bad habits in the kitchen. He also wanted to keep up his physical activity which can be a challenge for anyone who works long shifts, whether they are a medical intern or a truck driver.

So Jonathan thought to himself, there needs to be an app for that. Jonathan's app allows users to plug in their gender, their height, weight and age. This lets them monitor how many calories they are personally burning while engaged in a range of activities -- from sleeping to ballroom dancing. And this is just the beginning. He has other now health related apps that allow them to connect with the physical activity with the nutritional intake. These are just a couple of illustrations of the kind of work and research done by graduate students -- not just at the UC, but indeed at research universities across the United States.

Now when it comes to food, we are of course talking about much more than just what we eat. We are talking about delivery systems, climate issues, markets, population growth, microeconomics, policy, energy, water, the law. All of these and more come into play when you begin to think about the colliding forces that shape the world's

food future. And that brings me to the third student I would like to tell you about this afternoon.

Her name is Jeanette Rapicivoli. She is a graduate student in plant pathology at UC Riverside. Jeanette studies the microbial patterns of plants. Her goal is to figure out how these microbial patterns can be used to strengthen plants' immune systems so they can better fight off disease. She uses a telling analogy when she discusses her research. Pointing out that humans can move away from someone who is coughing or sick, but plants cannot. So diseases, when they come, can be devastating.

So she's been researching just one disease that effects just one crop. Grapevines. The disease is called Pierce's disease. It costs the state of California more than one hundred million dollars a year in crop losses in efforts to mitigate the disease's effects. It still amazes me; she has written that something so small has the propensity to cause such catastrophic damage. She hopes that her research will ultimately serve as a panacea for many of the diseases that wreak havoc on agriculture every year. In fact, she cites estimates that twenty percent of the global harvest is lost to plant disease on an annual basis. In the U.S. alone, crop losses total more than 30 billion dollars annually, and I think that's a conservative number. But that's almost as much as what is grown dollar for dollar in California every year. So she's taken on a big challenge. And her challenge again is to focus on one disease affecting one crop.

I have to say when I hear about Jeanette's research or that of Alberto or Jonathan -- I'm optimistic about our chances of managing successfully all that food entails -- from food production to national security, from public health, to the sustainable management of our natural resources. I also take great hope from those of you are joined here today who are committed to understanding the scope and complexity of something that we just embrace with one word -- obesity, or food, but which in fact entails so many different parts. So I hope you will join with me and with the University of California and the nation's other leading public research universities, in our efforts to do

everything we can to identify global challenges and to find effective ways to combat them for the future.

Thank you very much. (applause)

MR. HAMMOND: Okay, take a seat here and we'll have a little bit of a discussion.

SPEAKER: (inaudible) for today that obesity and food more generally are very complex topics. And given your background and your experience in policy making as well as your role now, engaged deeply in the enterprise of research as President of the UC system, I wonder if you could talk to us a bit about the value that policy relevant and policy oriented research such as is conducted by any of the UC schools as well as by Brookings has, as an input to a decision maker and policy maker, and particularly what I perceive from your remarks to be the underlying need for research from many different disciplines or interdisciplinary or trans-disciplinary research on such a topic as obesity which is inherently complex.

MS. NAPOLITANO: Right, so a couple of points. One is that as a public university, one of our missions it to take research being done in a lab, or an idea being thought of as a dissertation or what have you, and to explore what application does it have out in the world and how best do you communicate that. How do you get something that is being done out at Davis into the mind of a policy maker here in Washington D.C.? How do you get an initiative that's being centered out of Oakland and have it put into a national conversation? And that's not easy to do. It requires focus and concentration. And it requires a recognition of the fact that these are multidisciplinary issues and that there needs to be a convener of sorts. Like Brookings is a convener. The University of California, in its own way is a convener. So that you begin to think about not just, say the science of microbial infections in plant disease, but how that actually translates into, all right well how are we going to spend our money at USAID? Not just about obesity in the population of children of migrant workers -- well but how does that affect what HHS does

and what it funds or doesn't fund. Not just an app that allows you to monitor your caloric intake and your energy level, but what about that being covered under the Affordable Care Act, or under insurance provided by the Affordable Care Act.

So you have to not only have the ideas -- but see the applications, then have some kind of way to convene and then see, all right well, then, how does that spoke out into different elements of a complex problem?

MR. HAMMOND: I would agree with you entirely on that. The other point in your remarks that I think is very valuable and I'm going to draw out a bit is reminding us that this is a global problem. This isn't just a problem in the United States and our research that we presented already today in collaboration with UC Davis with the UC Food Center is really focused on U.S. cost estimates. But this is in fact a global challenge, and food is embedded in a global system and in fact it's the World Food Center. The word world is in there for a reason. And I wonder if you could talk to us a bit about your perception of this not only of this as a global problem but also with the role in which the costs that we're facing as a result of obesity may affect the U.S. and its competitiveness in global markets?

MS. NAPOLITANO: There are a couple subparts to the question, but I think, and part of what I talked about when I talked about the Darfur stove or whatever, when you talk about the global food issue and we're thinking about food insecurity, like the ability to have a nutritious food future. But when I think about a nutritious food future, I'm thinking of both ends of the spectrum. I'm thinking both of the inadequacy of having enough food to eat and obesity on the other hand which is too much of the wrong kinds of foods. So that's the spectrum of the issue. We actually have both ends of that spectrum represented within the United States, but we have it at different levels in different parts of the world. And then it affects our international relations in different ways. One is the whole issue of geopolitics. And migration around the globe, fuelled a lot by -- and we see it, we see it right now going on with the migration out of Africa and into Southern Europe.

Their food insecurities are a key driver of that. And that then has a spillover effect into the rest of the globe.

You see it in terms of the balance of trade and how that relates to the United States to countries around the globe, and the balance of trade and that goes in the trade agreements. We have one that's up for a vote this afternoon, I think here in Washington. So there's no way you can take a topic like food, which effects every single human being and not then see how it spills into different kinds of public policy. And so what you have to say is -- how important is it? Is this something that should be a primary interest in the United States or not? Is this something that is a key public health issue in the United States or not? Is obesity something that we should take on like we took on tobacco, and actually move the needle on the use of tobacco by young people or not? And if we are going to take it on, what are the methodologies that are going to be most effective and how do we test that out?

MR. HAMMOND: Absolutely. Do we have questions from the audience for our distinguished keynote speaker? I see one in the back there. If you could use the microphone when you ask your question and remember to identify yourself.

SPEAKER: My name is Edwin Dubois and I guess represent Joe Average on the street. You're in a unique position being in the background of politics. How in the world can we justify a Department of Agriculture who supports these productions with the different grains and ethanol and what not when we need more fruits and grains, excuse me, fruits and vegetables to be consumed by the American consumer? How can we make that change politically to get more of our money for the Department of Agriculture in the areas that are most healthy for human beings and then also politically if you will, how can we encourage more people to partake with the foods that this bounty would create?

MS. NAPOLITANO: Well I think -- and I think one of the last speakers said something I thought was very apt, which was that we're getting better at getting

healthier food to taste better. And I think one of the attractions to the things like fast food is it tastes pretty good. It marries up with our taste buds pretty well. But now we're seeing all kinds of movement in the commercial food industry so that the choices are more appetizing. And that's, if you want to put people on the road to least resistance, having them have some food that is good choice that actually marries what they like to eat. I think with respect to the politics of agriculture, that is perhaps one of the most complex parts of our politics, because you have lots of different interests involved, lots of different growers, lots of different historical patterns. States have different views on what makes sense, and so working that through our political system is extraordinarily difficult. Where I have chosen to focus is with the notion that research in the end, and quality research in the end, can help drive politics to a better result. But it doesn't do it overnight and it's very incremental. And part of it is educating the younger generation better than the generation that came before. So I don't have an immediate answer to that question except to say that I predict we're going to have some, what you and might view as unsatisfactory results in the Congress where AG is concerned. But it can be something that gradually moves in a better direction.

MR. HAMMOND: Important to recognize also I think that the food supply in the U.S. is actually globally sourced to a large extent. A large proportion of our food does not come from the U.S. and therefore, the USDA's control over the global food system is by nature one piece of a much bigger puzzle. Other questions from the audience?

SPEAKER: As an example of an approach that might be emulated in change in diet, and something that doesn't get spoken about I've found, is how the tremendous collaboration that occurred in the twentieth century -- the early part of the twentieth century, to improve the diet of Americans so that they had enough calories, so that they had enough vitamin A and D, so that they had enough iodine in the food supply fortification -- all that. And can you envision American policy makers and manufacturers

and everybody else getting as behind obesity as they did behind improving the food supply then?

MS. NAPOLITANO: Well I think that's one of the features behind the First Lady's campaign and the Let's Move campaign, is to do just that. It's been difficult though and we saw that with the politics surrounding the lunch program, the school lunch program, and what counts and doesn't count, and under the theory that what you count, counts. We didn't probably end up with the perfect balance in that program. The thing about tobacco is, it was kind of one enemy and it was pretty clear to see and you could really direct your marketing and you know, go after it. And the health impacts were so obvious. I was a state attorney general during the fights with big tobacco and then the implementation of the master settlement agreement after that. When you're dealing with food it's much more complex because you're not telling people don't eat. You're saying don't eat that. Or you're not even saying don't eat that -- you're saying don't eat as much of that as you eat of this. So from a, what kind of education message works, what kind of public marketing message works, I don't think we've found it yet. I don't think saying obesity is bad is the answer. I think and we were talking about conveners earlier on. I'd love to convene a room of advertising people and give them the charge of, come out with an advertising campaign aimed at a better nutritional outcome for six to ten year olds. And just let them have at it and see what they come up with. I bet it won't be anything like what we see today.

MR. HAMMOND: Questions from our audience? Oh you have a question, please.

SPEAKER: I was wondering if you might speak a bit to your time as Secretary of Homeland Security and whether you saw any particular issues in public health manifest themselves within the military, leading to obesity or not that surprised you.

MS. NAPOLITANO: We didn't, not in that way. But from a security perspective, we were looking at issues like what is the effect of climate change and all of the manifestations of climate change on global security? What is the effect of perennial drought? What is the effect of food shortage caused either by international conflict or by the fact that there has been a failure in production or whatever source? What is the effect of migration? And when I say migration I mean mass migration of when it's millions of people that are on the move. And that, as I mentioned earlier, one of the causal factors of that is food insecurity. You have to feed your family. You have to have some sense as a parent that you'll know the next day where a meal is going to come from.

So we were looking at some of those long term, very geopolitical global aspects of food as it related to those phenomenon. And they're quite serious by the way. So when we say at the University of California Global Food Initiative -- one part of it is actually looking at some of these security aspects having to deal with food, not restricted just to obesity in children.

MR. HAMMOND: Question in the back.

SPEAKER: Any comments regarding China and the economic impact of the food industry, but also the health care impact that is going on in that community besides?

MS. NAPOLITANO: No, I'm not sure I'm the best person to ask about that. I would defer to others. Obviously, whatever it does and focuses on, it's going to have a big impact because of where it is and how big it is. But specifically there, I think I'm not the right person to ask.

MR. HAMMOND: He said he it is a topic of great interest to China at the moment, for obvious reasons and when you think about the size of China and you think about the kinds of per person costs that we were talking about earlier today.

I think I'll conclude then. I'd like to thank Janet Napolitano for being with us -- our distinguished keynote speaker. I'd like to thank our expert panel. You heard

today about some new research that was conducted here at Brookings by the Center on Social Dynamics and Policy in partnership with Robin McKinnon and with the UC World Food Center. And this research I think, as well as the comments from our speaker and our panelists, underscores the significant costs both to individuals and to society of obesity and the epidemic we're facing of obesity, as well it's importance as an ongoing focus both for policy and for future research. So thank all of you for attending and it's been a great discussion.

MS. NAPOLITANO: Thanks.

(Applause)

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