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Transcript of Webinar

Title: *Health and Economic Mobility*
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Good afternoon and thank you for joining us. This is the Institute for Research on Poverty at the University of Wisconsin, I'm the host for your webinar series, Steve Cook. Today we'll be learning about the relationship between health and economic mobility. Are presenters are Atheendar Venkataramani who is a physician and health economist with Massachusetts General Hospital and Harvard Medical School and Rourke O'Brien who is Associate Professor of Public Affairs at UW Madison. I would like to thank our presenters. In addition to them, IRP would also like to thank the Office of the Assistant Secretary for Planning and Evaluation at the Department of Health and Human Services for their support of this webinar series. We would like to encourage the audience to participate in today's presentation. You'll notice the Q and A box at the bottom of your screens. You can submit questions at any time throughout the webinar and we reserve time at the end for our presenters to respond. Now, Atheen will start us off. Steve, thanks so much. So when we're talking here about health and economic mobility, what we're really talking about is the relationship between health and the American Dream. I think it's a concept that's probably familiar to all of you. But here are two prominent academics. One, Raj Chetty an economist and Robert Putnam who's a political scientist, basically elucidating this idea that basically regardless of where you start in life, what your family background is, anyone can ascend the socioeconomic ladder. So that's essentially what underlies this notion of the American Dream and in some ways it's really tied to our national identity. As you probably know there's a sense that the American Dream is not as accessible as it used to be in the past. So, both sides of the aisle, this is President Obama last year in the State of the Union Address and then the Republican side as well have placed restoring the American Dream as a really important public policy issue. And so what we're going to do here is talk a little bit about the American Dream which we're going to call economic mobility or economic opportunity interchangeably in how we measure that. And then we're going to talk about the relationship between economic opportunity and health and the sort of bidirectional relationship that we think is going on here. First we'll talk about how economic opportunity could affect health and then we'll talk about how health affects economic opportunity. And in the end we'll put it all together and discuss some implications for policy. So I'm going to hand it over to Rourke here to start us off. Great, thanks so much Atheen. So, part 1. First we're going to talk about what is economic opportunity and how do we measure it. So, just to start by defining some terms. So, as Atheen already mentioned, when he and I do this work together, we often use the concepts of opportunity and mobility somewhat interchangeably. That's because we think of opportunity as, we conceptualize it as the prospect of upward social mobility.

So when we're talking about social mobility, we're talking about it usually by comparing between generations so to what degree is your status, your position as an adult determined by the position

of your parents. So, these days, we often do that by trying to compare incomes across generations, but the study of mobility has a long and rich history. In sociology it's been differently conceptualized in the past as even comparing occupations between generations, comparing fathers to sons, or even occupational prestige. So your relative status in society. We're going to be looking specifically at economic mobility today, that's looking at how parents' income determines children's income, but mobility can be conceptualized much more broadly. So, one thing we wanted to flag as we kind of move forward in this discussion of mobility is that it's a distinct concept from income inequality. Income inequality, which we all know has received a lot of attention on the campaign trail and has certainly been at the forefront of our political discourse in the last several years refers to the distribution of resources at any one point in time. Opportunity though is a multigenerational process. We're interested in people's ability to rise in the income distribution given where they started. So these two concepts are pretty well related and we're going to come back to a few different points in the presentation how these two work together, but it's important to keep in mind during the call, we're really interested in this concept of upward mobility, which is a generational process. So now how do we measure mobility? Well, there are a few different ways that we can do this. The first is this notion of relative mobility. This is simply understood as the correlation between the income of parents and that of their children when measured in adulthood. So, when there's a lower correlation, that means that the parental income is not very predictive of child income in adulthood. And so we'd say that means that there's more mobility. When there's a higher correlation, that means that the parental income is highly predictive of the child's income in adulthood and that would indicate that we have lower relative mobility. But we might also want to be interested in mobility outcomes. So, relative mobility tells us what the whole distribution looks like and how much movement there is up and down. But we might also be interested in, conditional on starting in a low income household, how likely is it that you're able to climb up the income ranks in adulthood. So we're going to be also looking at a measure of absolute mobility, which is just the average income of children born to poor parents. So, here it's easier to understand that the higher values mean more mobility. And then it's also important to keep in mind that these measures are retrospective. By that we mean that we can only have a valid measure of mobility by looking back in time. That is, by comparing the incomes of individuals today to that of their parents at some point earlier. And it's really important to keep this in mind because we actually don't know what mobility outcomes will look like for the generation of children who are alive today. There's some evidence to suggest that mobility is relatively sticky over time, but we won't know the mobility outcomes for children that are being born right now until we have the ability to measure that a few decades from now. So it's really important to keep in mind that there are always retrospective measures. One really exciting development in recent years, one thing that got Atheen and I really interested in health and economic mobility is that mobility is something that's notoriously hard to measure because you need income data at two points in time. But, in the last few years, thanks to Raj Chetty and his team in cooperation with the Treasury Department, we've gotten access to some detailed databases that have really allowed us look at the full population of people born in the United States during the 1980s, and generate reliable mobility estimates using administrative tax records. So, this has allowed us to really, for really the first time, get granular in understanding of mobility outcomes across the United States. And this map here is one that probably looks very familiar to most of you. This was a map constructed by Chetty and his colleagues as I mentioned in partnership with the U.S. Treasury Department. They were able to obtain links to parent-child income tax data from tax returns for over 40 million records. So they basically had the entire universe of children born between 1980 and 1993 and their tax records with income data and they were able to link that back to their parents when their

children were in early adolescence. So from this large, population-level dataset of income tax data, Chetty and his colleagues were able to estimate measures of intergenerational economic mobility across the United States for these birth cohorts. So, one of the first and starkest findings from this effort was the tremendous subnational variation in the degree of economic mobility in the United States. So this map, which you've surely seen, it's been reproduced multiple times in the New York Times, and other popular venues. And what it shows is the expected mean rank in the national income distribution for children born to parents at the 25th income percentile. So, put another way, this is looking at conditional on being born in the 25th percentile, so a relatively low income household, where do those children end up in the income distribution in adulthood? The lighter colors mean they made it higher up the income distribution, so even to the 50th or 60th percentile. And the red colors indicate they didn't make it too much further than where they started so their parents' income position had a strong gravitational pull and the children weren't able to escape into adulthood. So, just to give a sense of what this kind of picture looks like, there are different kind of way to summarize these statistics but one is that that overall correlation, the relative mobility measure between parents and children using these data is somewhere just shy of about .3. That's the correlation between parent income ranks and child income ranks as measured in adulthood and that seems to be corroborated by a number of other studies that social scientists have been using over the years to try to track mobility over time. If we look at the absolute mobility outcomes, conditional on starting at different points of the income distribution, the most striking feature here is the really strong regression to the mean. And by that, all I mean is that there's this tendency that if you start at the bottom, more likely than not, you will do a little bit better than your parents. And conversely, if you start at the top, it's pretty likely that you aren't going to do quite as well as your parents. But these averages obscure some really interesting heterogeneity underneath. Most notable of which is the real stickiness at the ends. So, kids who born in the bottom decile or the top decile or the top decile are much more likely to end up in those positions in adulthood than folks who are born to other parts of the distribution. So, now I'm going to turn it over to Atheen to talk a little bit about what we know about how this is changed over time. So, how it's changed over time, Rourke, is actually a topic of debate. This is data Raj Chetty's study on economic mobility and here I'll refer you to this line that I'm going to point to, and basically, what he suggests, or what these authors suggest is that economic mobility or relationship between parent and child income has not really changed over time. And this is a 20-year period. But, if you look at Rob Putnam's recent work, his book, *Our Kids*, which came out last year. There's a suggestion that mobility may have been higher in the past, say for cohorts born in the 1950s and 1960s. And there's also a suggestion that going forward, mobility may actually be lower than it is today because of certain changes in the environment that we think are related to social mobility. So what are those things? And we'll briefly talk about that here before moving on to the relationship with health. So, there's a lot of theories out there as to what could drive economic opportunity and social mobility. And I'll just highlight a few of those. One is that income inequality, which Rourke had pointed out earlier, is a distinct concept. Income inequality itself may lead to lower opportunity and the idea is that unequal societies can lead to the redistribution of resources in certain ways that may change the investments in public programs for example, that may actually have implications for the mobility of the poorest citizens in a given area. Social capital is this idea that institutions that we may not think of necessarily as economic ones, our friends, our clergy, religious institutions, neighborhood organizations. All of these factors may actually play a role in allowing individuals as they go through their life to gain access to different economic opportunities. I see that my parents are on, on this cast right now, and so I would like to highlight early childhood education and families. These are both, we're seeing more and more research, especially from James Heckman and

his group at the University of Chicago highlighting how early childhood investments by parents, by schools, can have very important long run benefits as far as income realizations in the future. So, interestingly, we're still figuring out which of these factors we may be missing. And that map that we showed you of the United States and the sort of sheer heterogeneity in economic mobility, we're still looking for good explanations for why that is the case. And that is a very active area of research. One thing we're going to note, and this is to sort of foreshadow Rourke's portion here, is that health has been absent from this conversation thus far. So, he's going to change that in just a little bit. Before he does that, let's get into the first, part 2 which is basically linking economic opportunity to health. So, how would this work? There's actually three different pathways that may link opportunity and health behaviors and health outcomes. The first is the economic channel. And the idea here -- and it says returns to human capital investment -- the idea here is that higher economic opportunities mean access to better jobs. And to do well in those better jobs, you need to be healthy. So people may feel more inclined to invest in their health when they have access to these sorts of opportunities. The second channel is hope and aspirations and that simply means that increasing opportunity or access to the American Dream leads to great hope and there are psychological benefits that spill over on health behaviors and health. And, lastly, economic opportunity can lead to improved socioeconomic status, which means more income, access to health insurance, and education. And we know from a wide literature in the social determinants of health that all of these things are actually themselves important for both health and health. And just as a quick aside, the reason that I started working on this question was I had a patient who for many years, he's a young man, for many years he was trying to quit smoking, but really hadn't taken. So, after about three years of this, I asked him, what's going on? Can I help more? And he said, 'well, honestly, I'm not motivated. What's the point when I'm just going to be stuck in this position for the rest of my life. Why should I put in the effort?' And I think that really speaks to a lot of these different avenues that we see right here. So, that was actually the impetus to start studying this relationship. And so the first place that we started actually was looking at mortality. So, death rates. And the thought was simply, is there a relationship between economic mobility and mortality? And we used data from U.S. counties to do so. And you can see this graph here. Each of these gray points is a county. And, all we did was, in a cross sectional study, we looked at this relationship, controlling for a number of other factors including the average income level of the county poverty rates. Income inequality. Measures of social capital, measures of segregation. Measures of age distribution and average education. And even after accounting for of those things, we found a very strong negative relationship between mobility and mortality, meaning in counties with higher economic opportunity, mortality rates were about 17 percent lower. And I'm just inverting the statement that I had up here. What that means is, if you go back to the map that we had from earlier, low opportunity was really concentrated in the southeast. If for some reason, conditional on all of these factors, you move the southeast to the level of the opportunity that we have in, say, here in the northeast where I am now, that would potentially account for 103,000 deaths, which is just lower than the number of deaths nationwide that we have from stroke, and more than the nationwide deaths from something like diabetes. So, it's actually a pretty big number. And I make that causal statement of course with a little bit of caution. We are just here showing that there is a correlation and the idea was this is worth studying further. So the next thing we move to was looking at the relationship between economic opportunity and morbidity. So this is not whether someone is alive or dead, but how sick they are and in the U.S behavioral risk factors surveillance study, they tell us. 'I think I'm in poor, fair, good, very good, excellent health' and these number of days in a given month, I feel like my health is poor. So we could look at physical and mental health that way. And the striking thing, which

you can see on this map is that those two concepts -- opportunity and one's measure of their own self-reported health are very very strongly tied. And again, this is after controlling for all these different indicators that I had mentioned just now. One of the interesting things is this county-level measure of economic opportunity, that slope of that measure, meaning the relationship between that and one's level of morbidity is about 25 percent as steep as the relationship between individual education and morbidity and individual education is one of the strongest social determinants of health that we've known, it's one of the most stable. We see it in every population over time. So the fact that there is such a strong signal from a county level measure is really, really striking. One of the other things we thought is, is it possible, not only does economic opportunity, does it have some independent association with health outcomes, but does it actually modify the association between other determinants of health and health outcomes? So this line here, the blue one that I'm pointing to is a well-known relationship between people's household income and their health status. And what we see here is what we've seen in many other studies, is that as income goes up, people tend to be in better health. The interesting thing is, this is a line for counties that are low opportunity. But if you look at high opportunity counties, which is up here, you see that this line is less steep. And basically, for the same level of income, someone in a high opportunity county has much better health status than someone in a low opportunity county. Again, their income is no different. And that difference basically amounts to 11,000 dollars worth of health if you extrapolate from these curves. So not only is there kind potentially direct relationship, but it's also possible that opportunities modifying the relationship between social factors and other determinants of health. Rourke, I think it's time for you. Yep. So going back to this question of the link between mobility and mortality, one of the things that Atheen and I became interested in as we were starting our own kind of journey kind of getting this link between health and economic mobility. When we were starting this work, at the same time, a landmark study was released by Case and Deaton, two economists at Princeton that found that a pretty shocking increase in white middle aged mortality over about the last two to three decades. You guys might have seen this. It made national and international news and it's actually already spawned at least a dozen follow on analyses trying to figure out exactly what's going on here and the real simple descriptive story Case and Deaton tell us is that between about 1990 and 2010, white middle aged mortality has either stagnated or for some groups increased whereas in the rest of the country or for other groups in the country, we've continued to see mortality improve and in white populations in other countries, we also continued to see mortality rates improve. And so here you see a graphic which shows U.S. whites compared to mortality rates in other countries and during this time period, we're starting at kind of a similar place. A lot of European and as they continue to improve on mortality rates, white mortality stagnated or even increased. This is pretty alarming in an era where we've constantly been seeing health improvement across the life course. So in their study, Case and Deaton do an excellent job of just kind of laying out the data, and offering a few different hypotheses about what might be driving this pretty stark increase in mortality. One of the hypotheses that they set out there and that was really kind of picked up in popular discourse was this idea of blocked opportunity or specifically that many of the baby boom generation were the first to find in midlife that they were no better off than their parents. And the idea that Case and Deaton were putting out there was that these blocked opportunity structures were inducing some negative health behaviors such as higher drinking as well as some mental health outcomes such as depression that were in turn leading to these increases in mortality rates. So this is a really interesting hypothesis, obviously quite central to the work Atheen and I were doing, so we decided to test this directly by first, what we did was we used these county level mobility measures which you'll see in the bottom panel there on the same map that we have produced

time and again here and we compared those rates to the percent change in white middle aged mortality rates between about 1990 and 2010. So we went to the same vital statistics data that Case and Deaton used but instead of just looking at trends nationally, we tried to understand, well, is there geographic variation in this change in white middle aged mortality during this same time period and to what extent does it map onto the variation that we see in economic mobility outcomes or our opportunity structures measure? And so, I won't go into the details of the analyses here, but we made sure that our regression models were also netting out other changes during this time period that might also be influencing mortality. So including at the local level changes in poverty, unemployment, inequality, educational attainment, marriage, etc. And, even after netting out all of those covariates, one thing we found was that at the end of the day, mortality did increase about five percentage points more in low mobility counties relative mobility counties. This is pretty stark when we consider that this is net of all of those important covariates that typically explain much of the variation in mortality rates and certainly in changes in mortality rates over time. So we think this is a pretty useful test of this hypothesis that was offered by Case and Deaton and was picked up in this popular discourse that there really might be something to the idea that blocked opportunity structures are associated and might be driving this mortality increase that we've seen among the white middle aged population in recent decades. So again, I want to caution that this isn't a causal story here, but this description that we're seeing certainly tells us that there is something going on here and, notably, that these new mobility measures are among the first and only that are really able to give us a handle for what's happening with this important public health crisis with this rise in middle aged mortality. So now I'm going to turn it back over to Atheen who will describe how we can also find insights on the link between health and mobility by looking at the impact of public policies that are reported to directly influence itself. The real question here as Rourke mentioned was what happens when we change opportunity or the perceptions of opportunity with policy, what happens to health when we do that? And this is a useful question to ask for two reasons. One is, it's actually relevant to what we can do about this. And two, it helps us get at a causal relationship. What we presented so far are very strong associations in the data that seem like they should not be ignored given how persistent and robust they are. But they don't quite get at a causal relationship. So that's what we sought to do here. And so we looked at two policies or two sets of policies that we can credibly use as what we call natural experiments. The first policy is state level affirmative action bans which we'll say a little more about and the second is what may be more popularly known as the Obama Dreamer Act but here, the Deferred Action for Childhood Arrivals Program or DACA. So let's take them one at a time. So affirmative action bans: So, since 1997, ten states have passed bans for the consideration of race in university admission decisions. We know from other work that these affirmative action bans have reduced the percentage of underrepresented minority students who are represented in these particular colleges. So our thought was this -- banning affirmative action in some ways is a signal to economic opportunity, right? It's a signal about the chances of being in the most selective college, which some people suggest is important for wages and life outcomes later, though that's of course controversial, but more generally it sends a message about what opportunity may look like in the future for underrepresented minorities. So what we we were able to do was compare health outcomes or health behaviors for underrepresented minorities who were in states where affirmative action bans were passed against changes in those behaviors in states that didn't pass it. So this is the difference in difference research methodology. And what we found when we did that was, you can see this right here, I'm going to move the arrow in there, but once this ban went into effect, which is right here, smoking rates, and actually alcohol use and unprotected sex rates rose about 10 percent among underrepresented minority

high school students. And it rose very sharply with the passage of the ban. We didn't see this relationship for white students and other non-underrepresented minorities. And we found this relationship even for students in 12th grade, who, by the time of the survey had already known their college decision. So that suggest a couple things. One is affirmative action bans are specifically affecting underrepresented minorities not only in their educational outcomes, but in their health outcomes. And, two, it's not just people who are prospectively thinking about college, but people who are already in college but haven't yet gone who are reacting to these bans and it suggests that there's probably more to this than just the chance, not being able to get in a top college changes people's behaviors. It seems more about what people expect about their future opportunities going forward. So this was one of our first pieces of causal evidence that this opportunity and health link may be bidirectional. Here's the second policy. So, President Obama in 2012 passed the Deferred Action for Childhood Arrivals Act, that's DACA. And the idea of this act was for certain undocumented immigrants, those who had come to the United States before the age of 16 and who met specific age criteria and who had been in the United States for five years, they would be given temporary work visa with no threat of deportation that was renewable potentially going forward. And so the idea is for people who otherwise may be under threat of being deported or not being able to access formal economic opportunities because of their undocumented status, now there was a chance to do all of those things. And so because the eligibility criteria was so strict and because the policy came into effect at a particular time, we could compare people who were similar but on either side of these policy cutoffs and look before and after to see if there were any impacts on their health outcomes. We started by looking at their economic outcomes. And what we found was that employment went up by three percent as a result of the program and this is focusing on undocumented immigrants of Hispanic origin. We found that poverty went down by three percentage points and we found that access to health insurance went up. What was really interesting though, is we found large effects on self-reported overall health and what I'm showing here is effects on depression which is through a standard, clinically validated depression scale. And here's the year, the vertical line is the year the policy went into effect and what you find is that depression rates, this is moderate to severe depression, decreased markedly. The other interesting thing about this graph is that if you look at the economic outcomes, employment, poverty, and insurance, those things start to break about a year after the policy goes into effect because as you can imagine, one has to apply for the DACA program, be accepted, and find a job. So there's a lag between when President Obama announced the policy and when economic outcomes actually changed. But depression actually went down right at the time policy was announced and it suggests that there's more to the link between opportunity and health than just access to better jobs and more resources. This hope channel may also play a very, very important role. So, I think that's the important take home from this particular graph. And, to summarize, we have two natural experiments here and we're working on a couple of others, that basically, lend causal credence to this idea that economic opportunity is important for health and that these health effects -- as a clinician I can tell you are incredibly large and meaningful from a medical perspective. Rourke, I'm going to turn it over to you. Great, so thus far, we've been really interested in exploring that link between how mobility or opportunity might structure or determine health. For part three, we're just going to quickly turn the tables and show that this relationship goes two ways. Here we're going to look at the other direction, so, how health itself and by extension, health policy might be a determinant of mobility. So, to do that, here we have on our left hand panel the trusty mobility map. On the right hand side, what we have is a map which shows the distribution of the incidence of low birth weight births in the United States. And this is for actually, the same cohorts are represented in both maps. So the birthweight outcomes for children born

in the 1980s on the right and the mobility outcomes for the children born in that decade on the left. So, why do we want to start with birthweight for trying to suss out the link between health as a determinant of mobility? Well, there's a large literature dating back decades that has demonstrated that health endowments at birth -- and we often operationalize that by whether or not a child is born with low birth weight casts a long shadow over the life course. And we certainly know that in the 1980s and 1990s, if they were low birth weight, they were known to, on average, have greater health problems over the life course, as well as lower educational attainment, and weaker labor market attachment in adulthood. So, health, education, labor markets -- all of these are key pathways to mobility. So we might expect birthweight itself to be an important determinant of mobility outcomes. What we did -- birthweight is one of these things that is registered in vital statistics data. So that's a federal dataset that's managed by the CDC which allowed us as researchers to access population level data on the incidence of things like low birth weight across U.S. counties in four different birth cohorts. So, taking a cue from Chetty and his colleagues who were able to access that population level dataset from the Treasury Department, working with IRS on the tax data for children looking at their incomes at around age 26 to 30. We said, hey, we can go to vital statistics data and look up what was the incidence of low birth weight for those same exact birth cohorts 30 years earlier and that's exactly what we did. So we went to vital statistics data and we generated these county by birth cohort measures of the incidence of low birthweight and we wanted to see to what degree that predicted the mobility outcomes at the county level for the same birth cohorts measured about three decades later. I won't go again into the details of all of the statistical methodology here, but, again, we were both trying to look across counties to try to suss out the relationship between birthweight and mobility outcomes and we were also able to take advantage of the small degree of variation within counties over time in both birthweight and mobility outcomes to try to a little closer to a causal effect or at least try to net out what is likely as you guys see from these maps, quite strong kind of regional effects or effects of place. And what we found in our models is a strong, quite robust relationship between the incidence of low birthweight in a county birth cohort and their mobility outcomes. So about a 1 point increase in the incidence of low birth weight is with about a one half point reduction in the mean income rank in adulthood. So, telling a causal story here is a little tricky because birth weight itself can be an important marker of health and other outcomes across the life course, but birth weight is also a strong marker of disadvantage, especially when we're talking about population level averages, we know that low birthweight is highly correlated with low income, minority populations, and kind of other measures. The causal arrow isn't quite clear here but since we have this population level data and we have the temporality matched up because we have birthweight in 1980 and mobility outcomes around 2010, this does provide some pretty strong evidence that health is playing an important role in the transmission of disadvantage across generations. And, while that study that I just showed you is the first that we know of to directly link health to mobility outcomes, certainly using these new, robust measures that we have from the Treasury Department, this concept isn't new. So, there's a large and rapidly growing body of literature across the social sciences that puts health as being quite central in the transmission of advantage and disadvantage across generations. So, this figure illustrates just some of the pathways through which previous studies have shown how health plays that critical role in linking economic status across generations. So, in the center of this figure we have infant and child health and as you can see, that is jointly determined by parental SES and parental health. So the degree that parents influence their child's health and that in turn influences health, education, and labor market outcomes, we can see very clearly how the transmission of advantage or disadvantage might be operating through a health pathway. And so we have we have a bunch of different numbers here, a bunch of different pathways. There's a very

large body of evidence looking at the long term impacts of birthweight as I mentioned, but the best causal stuff that is most convincing in this literature actually comes from evaluations of Medicaid expansions. So, for those of you who don't know, during the 1980s and 1990s which is the same time period of the cohorts that Chetty used to construct these mobility estimates, Congress and the states through a mixture of policy changes rapidly expanded Medicaid coverage to low income pregnant women and their infant children and so by taking advantage of the variation across states over time, a number of scholars have been able to estimate -- well what is the impact of providing this public health insurance program on children's short and long run health and education outcomes. From that very large and growing literature, we know that Medicaid expansions reduce infant mortality and the incidence of low birth weight, which as I mentioned in a previous slide certainly had an impact on mobility. We know those Medicaid expansions reduced health disparities among school age children with evidence of improved health outcomes even into adulthood, so again, that early life Medicaid coverage, we see lasting effects in adulthood and narrowing health disparities in elementary school and high school. Importantly, moving beyond health, we've seen a number of positive consequences for children covered by Medicaid that aren't directly related to health and that's including improved educational achievement and attainment for low income children, so this is including high school completion, college attendance, and as these cohorts have aged, we've even seen higher rates of college completion among children who were covered by Medicaid. And, more recently, we've also seen a few studies that are coming out as these cohorts are aging into the labor market that those children who are covered by Medicaid early in life were also more likely to be employed, more likely to be paying taxes back into the system, and less likely to be relying on public assistance. So, while this isn't direct evidence for the link between health and mobility, we certainly have all of the causal pathways nailed down and certainly by looking at these health policy interventions that were designed to really improve prenatal health and infant health, we're seeing that having impacts down the road on education and labor market outcomes which are certainly the key drivers of mobility. So while there's still a lot more work to be done to directly link health to mobility outcomes, we certainly already have evidence for all of the key pathways at work. Now I'm going to turn it over to Atheen to start us off on part 4 where we're going to try to put this all together and make heads of all of this new research. Ok, so basically the idea is what lessons can we draw from everything we just discussed? I think the big thing that I think Rourke and I have realized is that health and economic opportunity really do reinforce each and that thinking about that reinforcement means that policies in any one sector will have important spillovers for other sectors. And I think this is important for a couple of reasons. One is we often think of cost benefit analyses of policies in isolated siloes and understanding where the spillovers might occur is really important for budgetary purposes. So, looking at a mutually beneficial relationship between economic opportunity and health basically give us a value proposition for those who are budget conscious. And there's also potentially more to agree upon as we try to make decisions on what to fund and what not to fund. Thinking about it from the health sector which is where I sit -- health systems traditionally have not thought along these lines. I think we tend to be very good at delivering medical care but that's changing too with the work that the Robert Wood Johnson Foundation, the California Foundation, and others have funded around community level interventions that have tried to bring these different sectors together including job opportunities and economic opportunities. I think that's a very promising approach both at the grassroots level and at the sort of macro level where Rourke and I are sitting, I think there's a lot of interest in bringing these things together and there's a lot of implications for how we think about policy and how we evaluate it. And what Rourke's paper about birthweight really shows us is that not only does it have benefits in this generation, but firming up that link

between economic opportunity and health and taking advantage of this positive reinforcement cycle can actually have multiplicative intergenerational benefits. So things that we do today for infants, teenagers, parents, can actually have a very, very long tail going forward. And so part of our calculus should not just be how do these policies reinforce each other today, but what does that actually mean for tomorrow and if you start looking that far along, there are a lot of things that we might not a priori think are cost effective that actually do turn out to be so. And, again, James Heckman's work from University of Chicago really highlights a lot of that. I think Rourke really pointed this out already, but we know that the social sector has really broad benefits for the health sector and vice versa, from a number of natural experiments. Medicaid is a really great example but there's also food stamps, we talked about immigration reform, there are nutrition programs, there's a wide literature on Head Start. There's a wide literature on the Earned Income Tax Credit and how transformative that is for poor families. Not just in terms of their consumption, but also in terms of their health. And housing policy as well. There's lots of evidence now that basically more, I don't want to say the word "liberal" but basically policies that ensure stable housing tend to have pretty strong economic benefits with great spillovers so I think these are all policies that we can evaluate dispassionately and try to come to a consensus on by looking at the benefits they have outside of the immediate sector that they were intended. And that's really where Rourke and I think the next generation policymakers should be focusing, is to really examine a large swath of policies and think about them from the context of this opportunity health nexus. One of the other things that's interesting both from a research and a policy perspective is where does opportunity and health actually interact? So, are the policies most powerful at the neighborhood level, the county level, the state level, or is the household level? I think there's a lot that we just don't understand. The research that we've presented is predominantly work that operationalizes opportunity at the county level but it's not necessarily clear that that's where the opportunity-health opportunity nexus actually begins and ends and I think going forward this is what we'd like to work on and certainly what we hope others work on as well. Rourke, back to you. Great, so the last implication just stepping back a minute -- so Atheen and I have been presenting to you this new framework that we ourselves have been trying to puzzle through on this link between health and economic mobility and one of the things kept stumbling back to is that this framework might give us new insights into old questions. Most central of which is the relationship between income inequality and population health. So, in the literature, there's kind of been a robust debate for several decades now on whether and to what extent income inequality reduces population health and even individual level health. In that literature there are at two hypothesized mechanisms. One is a relative deprivation story and the insight there is that you might have a physiological response to the fact that you are not doing as well as your neighbor or not doing as well as others that you see on television, but the other hypothesized mechanism is that high levels of inequality are a proxy for a blocked opportunity structure. So, I know when I've been studying the kind of inequality link or the inequality to anything connection, one hypothesis that often comes up for why that would be a potential relationship is that if there's more inequality there's less opportunity. But those things don't necessarily have to go together. You could easily imagine a world where there's high inequality and high mobility or low inequality or low mobility or the other two buckets there. So, if we really think that blocked opportunity structures is one pathway through which inequality is structuring health, we now have the opportunity with these new measures to test that directly. So we think that if we bring this concept of economic opportunity as operationalized by economic mobility into this literature on population health, it might be possible to leverage these new measures to understand exactly how and through what pathway inequality is influencing health. So, with that, we want to thank all of our wonderful collaborators as well as our funders, the Robert Wood

Johnson Foundation who helped see this work over the last few years. I'll also note that as you saw us going through these slides, you might have noted the references on the bottom right showed that many of these papers are forthcoming or under review or in preparation for review so we're really excited to share this stuff which is not even hot off the press, it hasn't even gone to press yet. We're very much open to and welcome your questions so thank you very much. Thank you, Atheen and Rourke, this was a very interesting presentation and fruit for a lot of thought. Just a reminder to our audience, for those of you with questions, please go ahead and type those into the Q&A box at the bottom of your screen and we can get as many of those as we can to our presenters. The first question, I think, that's come up is one of race. So obviously you looked specifically at the relationship between economic mobility and health among this middle aged white population. Many people have noticed the relationship between Chetty's map of economic mobility and African American population in this country so there's a big correlation there I think on the face of it between race and economic mobility and obviously there's a lot of research that shows race effects on health outcomes as well so I'm wondering if maybe you can try and paint a big picture about the way race fits into the story connecting economic mobility and health. Yeah, it's a great question. And one of the things it's important for us to point out from the start is that while we're really excited about these new economic opportunity measures that we were able to get from Chetty and his team through a unique access to IRS data, one of the big frustrations is that we don't have those measures disaggregated by race, we only have a few things disaggregated by gender. And so when we get to thinking about how these processes and pathways and how they work for different subpopulations, we're really limited in that we only have these kind of full summary variables of mobility. So that being said, race is definitely one of these confounders that to the extent that we've been trying to tell a causal story or wanted to kind of demonstrate a real relationship, kind of in each of these papers I think give pretty good thought to trying to make sure that what we're not picking up is a race effect and one illustration of that is in that birthweight to mobility paper that I mentioned, we do know that African American children are much more likely to be born with low birthweight than white children even net of socioeconomic factors so we were looking even within counties over time we wanted to make sure that what we weren't picking up was an increase in, say, the African American population that would simultaneously be showing an increase in the incidence of low birthweight births and low mobility to any number of reasons why African Americans face more difficulty opportunity structures than comparable whites. One thing we did was we reran all of the analysis just looking at the incidence of low birthweight among white children and we got comparable results. So it's one way to say that we would love to do much more with race. It's something we're having to be significantly more creative about in both trying to net out a race effect and also to trying to triangulate, to trying to understand what is actually going on there. Yeah, with all the caveats that Rourke just mentioned, in the first study, looking at mortality and economic opportunity, we actually looked at race specific mortality as well. And the relationship between the economic mobility measure which Rourke points out is not disaggregated by race and mortality for African Americans is actually a larger relationship than what we found for whites. So, we did look at that but again, there are a lot of challenges there and I think Rourke points the way forward in how to deal with that. One of the biggest new health policies that's out there right is the ACA. I'm wondering if you should talk a little bit about how you think the ACA might sort of help mediate the link between this relationship? Change the relationship? Affect the relationship? Yeah, I think that's a really interesting area of research. So, there's more ACA papers than I can read in any given time but some of these papers are looking at the effect of one particular aspect of the ACA which is Medicaid expansions and their effects not just on health but on labor market outcomes including jobs and things like credit scores.

So, one of the more interesting papers out there shows that these ACA related Medicaid expansions have actually improved credit scores among the poor, and there's a signal there that actually labor market outcomes have improved too. And I think that speaks to this idea that I think we all sort of intuitively buy that health outcomes and the sort of the risk that comes with being uninsured can actually negatively impact our ability to perform in the labor force. So I think there's certainly that relationship and I think that is just begging to be explored further and we're just a few years into the ACA. As far as how it modulates the opportunity/health nexus more broadly, I think that's a very interesting sort of second order question that we haven't gotten into. But certainly on the first order side, there seem to be some economic benefits of the ACA. Thanks. In your implications section, you talked a lot about the extent to which various social policies, health policies, and maybe other policies might have these spillover effects on economic mobility. But, given the two directional relationship here, we could also think about explicit policies that might try and affect economic mobility as a lever to affect health or other social outcomes. I'm wondering if you could, if you've given any thought to what might be good explicit policies that could directly target economic mobility side of things. Yeah, I think most of the research we're seeing is that the more we can concentrate interventions and public dollars towards -- public and private dollars -- towards early life interventions, you know the better chance it has towards actually breaking that hold between parent and child income determinism and actually allowing children to climb the income ranks. So the degree that the data are available, would be surprised if we saw direct links between things like head start and quality education in the early years of life, better mobility outcomes in adulthood. What's difficult, both going back to this ACA question looking forward and when we're trying to understand what is the net result of some nonhealth interventions that might be increasing opportunity is the fact that mobility studies as we mentioned are retrospective. We can't really know the impact of anything now on mobility until we've allowed these cohorts to grow up and hopefully in the future we get access to this kind of amazing treasure trove of data but I think kind of the big takeaway what we do now is that health policy is social policy and social policy is health policy. And, if we improve health, that might do it's part to increase opportunity, and things that we know are improving opportunity, we should also look for signs that it's also improving health and we think that might expand our notion of what is the return on investment to a lot of these interventions. Ok. So thinking a little bit more on that, in your research looking at the affirmative action plans, the DACA… Those are treatments that affected people's perception of how their economic mobility may change in the future. I'm trying to think about how responsive people's perceived economic opportunity, future economic opportunity is to sort of immediate changes in the environment. Either policy changes or the current economic situation. I'm thinking about in the 1990s when the unemployment rate dropped and people were much more likely to get jobs. Did that have a strong effect on people's economic mobility for future, or is it something that is more embedded and requires more kind of drastic treatment to affect. That's a great question. So think there's one thing that's embedded in your question is 'what shapes people's perceptions of opportunity?' And when does that happen and what does it take? And I think that is for the researchers out there, that is an awesome question to get cracking on because I don't think we know for sure. But I think if you look at evidence from around the world, stuff like this happens pretty quickly. So, I'll tell you about two experiments real quick. These aren't our studies, but these are studies by other researchers. So, one was a study in India by Rob Jensen who basically randomized in an Indian village information about the presence of new labor market opportunities, specifically, call centers. So, the idea was just telling people that they're available, that you could get a job there. And what they found was, just providing that information, within a year, led to huge increases in human capital accumulation. When they looked at

women, women were getting married later, they were investing more in education and completing more schooling and all of that happened very quickly. I think it was in the Dominican Republic there was another experiment also by Rob Jensen, where the only intervention was telling people that going to school and completing x number of years of schooling was associated with an increase in wages. And that's all they said. And what they found was a year or two later, the children who were told about this, about completing school, actually did complete more school. Both of these studies suggest that aspirations and expectations of opportunity were pretty malleable and probably do vary with the environment I think in a very real way. And the Affirmative Action study I think also suggests that, because it wasn't necessarily a policy that affected everybody. On the margin, it did affect 3 to 4 percent. It was basically a 3 to 4 percentage point effect as far as getting into the top schools. But yet there was this large uniform effect in smoking and alcohol use. So, I think, my sense is it's suggestable and malleable and it's exquisite response, but I think that's a great area to keep looking. So one of the findings we have about low income, health effects of low income is it's related to health effects often through stress channels. Chronic stress, there has been a lot of research measuring cortisoid levels and things like that. So, I'm wondering if there kind of immediate health effects, if you think of economic opportunity or economic mobility having immediate health effects in the same kind of way or is it more behavioral? Yeah, I think all of the above, so I think from the DACA and Affirmative Action studies showed that quite immediately after you get these shocks of opportunity one way or the other, we see differential responses in health behaviors. And then we know, if those persist, which they tend to, then that can really kind of accumulate over the life course. What I really think is interesting these policy shocks that are being presented is that they are these kind of one time hits that were quite recent and we're already seeing kind of a disheartening health responses -- both mental health and health behaviors. And, if that lasts, than certainly we can see, we'd be able to trace back among these cohorts later in life when their health is deteriorating more rapidly, it could be due to these shocks of opportunity they experienced during critical periods in their development. And another thing I might add is it's not clear that the -- I think this is a great question -- it's not clear that the relationship between opportunity and stress is linear so it's possible that if there is high opportunity in a society, that that itself could create stress. This is all speculation, but I think it would be very interesting to look at that and certainly putting the Raj Chetty data together and perhaps NHANES data, which has cortisol measurements, random AM cortisol measurements, would be a very interesting exercise, just to get an initial look at that. One of the implications of Chetty's findings is that the lack of geographical mobility, or limits on geographic mobility kind of play a role here. Do you think that there are policies that improve geographical mobility for people, allowing them to move to areas where is greater economic opportunity? This may roll over a little bit into the race side of things as well, because I think that geographical mobility may be more limited for some racial groups than for others. Do you that there's a useful role for policy there in helping improve geographical mobility in affecting this relationship? Yeah, I think it's the right question and I think the answer is absolutely. If you look at some of the follow on studies that Chetty's team was able to perform, having access to that underlying data. They were actually able to generate causal effects of place on people's mobility outcomes, so they were able to say things like, 'to what extent is being exposed to New York City relative to Baltimore for 4, 5, or 6 years in your adolescence, what impact does that have on your mobility outcomes later in life? And what we see is across the country there are clear opportunity centers with some big cities that wouldn't be too surprising, places like New York, the Bay Area. And these happen to be cities that if you're lucky enough to be there or to be exposed to those environments, you do tend to do better at least as we measured your income in the national distribution as an adult, but

those are also areas that we all know are famously incredibly expensive to live in and most kind of low income households have been priced out or wouldn't be able to move in, so I think there are very basic things like housing affordability to help more people move to areas where there is more opportunity is a really kind of basic and fundamental policy that, as we mentioned will both improve opportunity and likely have positive health outcomes. Very good. Well, unfortunately, I think we're out of time, but this has been an incredibly informative presentation so thank you very much to Atheen and Rourke for really enlightening us. So, a reminder to the audience that a recording of today's webinar will be available on the IRP webpage starting tomorrow. So you can look for that there. Before we leave, we'd like to invite you to join IRP for future webinars which we have scheduled on the second Wednesday of every month. To enroll for our next seminar, you can click right on the link that's right on your screen now. On Wednesday, October 12, our presentation will be called "Using Data Science and Behavioral Science to Build Better Poverty Policy" and will features James Guszcza and Justin Sydnor.