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From Womb to Tomb: The Influence of Early Childhood on Adult Health

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Let me begin with a few assumptions. One is that you are here because you are interested in your health and that of your children. The second is that most of you assume that producing health in yourself or your children is something that one does today and reaps benefits tomorrow or the next day, or even in the coming year. I appreciate your interest and want to challenge the second assumption, namely that we can strongly influence our health by what we do today because that is not consistent with what we know to be true.

At least half of what influences our health as adults is determined by what happened to us when we were in the womb and for the first few years of life thereafter. Our health is influenced by what happened to our mother when she was in her mother's womb. Maternal grandmothers are important for our health. Fathers and grandfathers have some impact, but not as much.

It is only from considering such factors that we can come to understand why our health, collectively as a nation, is worse than that of people in about 25 other countries, pretty well all the other rich countries, and a few poor ones as well. We are about as healthy as Cuba, the country we have been strangling for over 45 years. Although we have a country that espouses life, liberty and the pursuit of happiness, in reality, we end up with a short life, the illusion of liberty and the pursuit of illness. What's wrong?

I won't say anything that is speculative in the sense that leading scientists and our Federal Government don't say in official or respected publications. Last Friday in the *New York Times* Op-Ed page, well known economist and commentator Paul Krugman pointed out how much our health status is poor compared to other countries. Most of these concepts are not seriously discussed in schools, or in the various media when health is talked about. I will tell you what I think needs to be done for our country to regain its health standing in comparison to other rich countries, what medicine we need to take.

I want to make two points. One is that our health, yours and mine, if we are from the USA, the world's richest and most powerful country, has deteriorated profoundly over the last decades, if we compare ourselves with other rich countries, namely our health relative to them has declined. For the first time since 1958, our infant mortality rate has also risen. More infants are dying while we perpetuate the illusion of progress.

The second point is that the cause of this health decline, the diagnosis, stems from changes in our own habits, but these are not the individual health-related habits that we all come to learn about, but from changes in our habits as citizens, as the sovereign people of this country. We are abdicating our responsibility as citizens to govern ourselves and are selling this right to the rich and powerful. This results in a bigger gap between rich and the poor which I now identify as the root cause

of our poor health. In doing this we've abrogated our sovereign rights to decide our own future. That is now in the hands of the rich and powerful, and our corporate elite, who look after their own welfare very profitably, but not ours. This diagnosis is actually hopeful because once we come to understand the cause, and the reasons behind it, then the steps necessary to return to the road for health become apparent. There is no quick fix. The time required for getting ourselves healthy again will take decades at least. The reason is that it is in the first few years of life where the medicine to make us healthy again has to work in order that we as adults regain our health.

Three people stood alongside a river on a brisk afternoon. All of a sudden they heard a cry for help from a person, caught in the river's fast-moving current, trying desperately to stay above water. One of the people along the riverbank started yelling at the drowning victim, "What's wrong with you, don't you know how to swim?" The second individual offered the desperate person discount coupons for swimming lessons. Fortunately, the third was a public health worker who jumped in the water and pulled the drowning person out.

Over time more and more people came floating down the river in need of help. Researchers showed up and counted how many people made it part of the way or all of the way out of the river and how many fell back in. They also collected other kinds of information about the risk-taking profiles of the people, their family backgrounds and educational levels.

A few progressive individuals decided to head upstream to see what was causing so many people to fall into the river.

More and more older folk, came floating down the river crying out for help, and it was not possible to pull them all out despite everyone's best efforts. Quite a few were lost. It became very expensive to keep pulling victims out of the river. Some of those who were pulled out ended up back in the river. People soon realized that pulling casualties out of the river would never be sufficient to reduce this problem. Too many kept falling in!

Upstream, they found younger citizens who were enticed into the river. The group found signs that read, "Go for it," "Just do it" and "Come to river country." Signs said the river "won't slow you down" and "It doesn't get any better than this." All around were cleverly constructed images that associated friends, success, sex, self-esteem, and the good life with the edge of the river and the rushing water. As these people looked around more they discovered that children were particularly transfixed by all these colorful signs showing sexy men and women, sports stars, sophisticated people and charismatic role models. They found a few warning signs but generally the barriers to risky behaviors and the messages about caution were over-whelmed by the almost magical inducements promoting swimming in the dangerous waters.

The upstream group thought to make the environment safer to keep people out of the river. But it was tough and they met with a lot of resistance. The river marketers said that the irresponsible behavior of a few bad apples, who did not know their own limitations when it comes to swimming, should not be allowed to ruin the fun for everyone else. The real problem, they argued, was that people were just not responsible enough. If each individual would just be more careful, treat the river with more respect, and learn how to avoid the strong current or how not to fall in, there would be no problem. The marketers argued that it was the responsibility of the family and the individual, not government or industry, to make sure the river was used wisely. Shouldn't families begin instilling better morals and teach their children how to navigate the currents in the river? They should develop better family values and institute swimming curricula for the local schools.

A few of the group painted over the billboards that were enticing people into the river. Others advocated for legislation requiring warning signs and counter-ads to be erected alongside the glamorous pictures. Still others brought attention to those who were erecting the signs in the first place, claiming they must share responsibility for the adverse consequences of their actions. The promoters turned to the government, claiming that the protestors were infringing on their freedom of speech. The public health workers countered that it is government's role to protect those vulnerable to the messages, particularly children.

A few others realized that there was still more territory upstream to be explored. Certainly exploitive marketing practices, misleading advertising, and general lack of responsibility of various corporate interests were important, but younger people were coming down the river in greater numbers from further upstream.

This small group headed further up to the source and found conditions allowing large numbers of children to easily slide off the steep slope. They plunged onto floatation devices and slid in great masses into the river to drift downstream. The reason they slid was because of the steepness of the slope. It was the steep slippery slope of neo-liberalism or trickle-down economics that politicians had told them was good for all. The slope was not the same steepness everywhere. Where it was steeper, adults were desperately clinging to their foot holds and trying to push off those who were below them, since they felt that those people were destabilizing the slope. This was going on all the way up to the top so even some of those who seemed secure higher up toppled down into the river. Where the slope was less steep, people felt more secure and would extend support to those above and below them as they negotiated the hazardous terrain. But for the children, where the adults were on the steeper slope, they easily careened into the river to glide downstream because the adults were too concerned with hanging on. However, where the slope was less steep, the adults played with the children and few of them ended up in the water.

The public health workers at the source discovered that the problem they wanted to address was a simple one. Namely the precipitous slope. So they crafted a plan to take some of the material up high and put it down lower and create a stable platform for everyone. They built a retaining wall so that no one had to fall into the river, no matter how much they played on the less steep slope they had rebuilt. Then slowly vegetation began growing and the area became covered with plants that

improved the environment for everyone. Many creatures began to live there and harmony became the norm. The adults were able to play with their children safely, and no one ended up in the river. Ultimately, having a less steep slope was the solution to the public health problems.

The most significant finding in health research is that the social and economic environment in which people live is the primary determinant of their health. The level of economic and social support people have is correlated with their physical and mental well-being. People are less sick, live longer, are happier and feel better when there are smaller gaps between the rich and poor in society. It is this upstream source of problems that ultimately must be addressed to produce health. We must link what is observed downstream with these upstream conditions. To do so we need to understand the upstream-downstream connection and to cultivate and use your voice to make these conditions visible and meaningful.

Upstream, we the people in the USA need to change the slope of the bank at the source to prevent people from falling in the river. Children are especially vulnerable. We must bring down the record gap between the rich and poor which prevents true democracy from working, causes ill health and leads to early death. This is an unlikely prescription for a medical doctor to offer, one who continues to practice medicine in the emergency department. It is what we must do, at least if we follow evidence-based guidelines.

Let me explain how I came to think about what makes a population healthy because it is not what I was exposed to in medical school or anywhere else for that matter. I began medical school at Stanford 35 years ago because after doing graduate work in mathematics at Harvard I wanted to do something useful and there was no question in my mind then that providing health care was the most important part of producing health. When I began, there were some 14 countries that were healthier than the United States when we compared the average number of years lived by the people in a country. This is called life expectancy, is routinely reported and is a good measure of health.

After working as an emergency doctor for 15 years, I discovered that our health, yours and mine, considered as a country, had declined by 1992, compared to the health of citizens in about 21 other countries. Yes, we were living longer than our parents, but compared to people in the other rich countries, not that much longer. I had not expected the decline to continue when I was in medical school, as I came to the US from Canada seeking the best and thinking the US was number one. Now it was clear the best was getting worse. I hadn't a clue why. The only thing I was sure of was that medical care had little to do with health of populations. Sure, I could tell myself I saved a life in the ER occasionally, but most of the time I found it hard to think that medical care had that much impact, despite the hype accorded it.

If you don't know something, you might reasonably consider going back to school. I went to public health school, Johns Hopkins, the biggest in the world to find out what made a population healthy. What I learned there affirmed my belief that medical care had little to do with health, but as to what mattered to explain our health decline, well, they didn't ask that question. Thomas Pynchon wrote in *Gravity's Rainbow*, "If they can get

you asking the wrong question, the answers don't matter." I try to not let schooling interfere with my education.

My discovery over the last thirteen years has been incredibly exciting, profound, and challenging. Exciting because there are real answers to this most basic of questions. Profound because they go back to basic truths about our species and how we live. And challenging because although what needs to be done to produce health is so simple it is difficult to get people acting on it.

Here is what I learned. Our health in this country has declined compared to other countries, and in absolute terms. There is no debate about this. The Institute of Medicine, a federally funded agency that looks at health issues, in its 2003 publication, "The Future of the Public's Health in the 21st century," on page 20 writes, "For years, the life expectancies of both men and women in the United States have lagged behind those of their counterparts in most other industrialized nations." At some point, we didn't lag behind. You will find that in the late 1940s and early 50s we were one of the healthiest countries in the world. In absolute terms last year our National Bureau of Health Statistics reported that for the first time since 1958, our infant mortality rate, the proportion of babies born that die in the first year of life has gone up. Our infant mortality rate is already the highest of all rich countries, so their report sounds a death knell.

The second concept, the diagnosis, is what determines health in a population is the nature of caring and sharing relationships in that population. I mean how well we look out for one another. Health is not produced by how well we look after ourselves. It is not what we do to make ourselves as individuals healthy, namely the usual do's and don'ts that I preach to my patients all the time: eat right, exercise, don't smoke, wear a condom, buckle your seat belt. There is nothing wrong with following that individual advice, it isn't wrong. But that advice is not that important when it comes to our health. Why do I say that? Take the healthiest country in the world by any measure, Japan. Twice as many men smoke in Japan as in the USA. Japan smokes the most of all rich countries, yet it is the healthiest. I'm not saying that is the reason Japan is the healthiest country namely the men all smoke. If I made that statement, you would be wise to discount everything else I say. But what that observation tells me is that although smoking is bad for you, compared to other things, it isn't that bad. There are worse things we do for our health than smoke cigarettes. What are those? Not caring for and sharing with each other.

I'm a scientist, I started out as a mathematician, where everything proceeds in a logical fashion from a few axioms or basic concepts. So you should demand proof from me for what I say. I do this in my courses in the school of public health and community medicine at the University of Washington. Students in their course evaluations are always amazed at how logically the arguments proceed. Even then they find these concepts hard to believe because they have not been brought up to think that way.

If we define our health as a country by the average number of years lived, the life expectancy, and if caring and sharing produces health, how can we measure caring and sharing and relate it to health? The science on this subject is amazingly diverse and consistent in its findings. There are measurements of social capital, of extent of friendships, of income distribution,

of political participation, of gender equality, of racism, of environmental quality, of child welfare, of numbers of prisoners (we house one quarter of the world's jailbirds) of access to medical care and many others. If we care for and share with each other, then there won't be such a big gap in incomes, or differences in political power, or numbers of prisoners, or women being treated unfairly, or children living in poverty, (a UNICEF report released last month shows our commanding lead in having the most poor children of all rich countries.) In all of these, there are strong associations of these measures with health outcomes. Note that I said associations, and critics will say association doesn't imply causation. They are right. How can we infer causation from association? Our federal agencies have spelled out the criteria to use, beginning in the 1964 Surgeon General's Report linking smoking and health. I won't trouble you with that academic exercise, but the association linking caring and sharing behaviors of a society to its health is causative. Societies that care for and share with each other are healthier than societies that don't.

You may say that what I'm talking about are death rates. You don't care how long you live, you just want to be happy, even if you don't live to a ripe old age. What I say also applies to quality of life measures such as happiness, and it will not surprise you to learn that our happiness as a nation has been declining.

A measure of caring and sharing is income distribution, namely how do we decide what to pay various people in society for the work they do. There are many different statistics for income distribution used by economists and sociologists and again I won't bore you with the arcane details of those and instead take a simple concept, namely how much more the boss makes compared to an average worker. I use mainstream data sources such as the *New York Times*, *Business Week* or *Newsweek* because I have had experience with getting articles published there and with the fact-checking process. Before they allow you to get something in print, they verify your numbers and sources.

In January 25, 2004, the *New York Times* reported in the front business page that a boss in the US makes 531 times what an average worker makes. The boss makes in half a day what you and I make in a whole year. If you have looked at almost any newspaper in the last decade, you've seen many reports about how the income gap has sky rocketed in this country over the last few decades. *Business Week* reported that the gap was only 42 to one in 1980. In the same issue of the *New York Times*, they mentioned that in Japan, the world's healthiest country, the boss only makes ten times what an average worker makes. As a measure of caring and sharing, during Japan's economic crisis in the late 1990s, bosses and managers took pay cuts, rather than laying off workers. You can't imagine that happening here. It won't take place unless we the people made it happen.

So more egalitarian societies are healthier societies. The feds state this pretty bluntly. The Institute of Medicine's "Future of the Public's Health in the 21st Century" I mentioned earlier, on page 59 they write: "more egalitarian societies (i.e. those with a less steep differential between the richest and the poorest) have better average health." That is clear to me, and this document was written during the current administration. Perhaps we should have a warning on our paycheck along the

lines of: "your low pay compared to the boss is bad for everyone's health in the US."

Notice I said your low pay is bad for everyone's health. Don't let me get away with such a pronouncement for this is a profound statement in which lies our salvation. There are now several studies demonstrating that the rich may be adversely impacted by inequality, in other words the rich have worse health than if they were less rich in a smaller gap society. While those who are poorer will always have poorer health, it is apparent that the rich are more harmed by inequality from living in high gap states in the US. The rich would have healthier lives if they weren't so rich in a smaller gap society. Part of our job is making the rich aware of this. Not an easy task but a doable one.

We no longer care for and share with each other and therein lies the reason for our poor health as citizens of the USA. At what point in the human lifespan, from womb to tomb, does caring and sharing matter most? The next point is also substantiated in federal documents. The time when caring and sharing matters most for our health as adults, the most important determinant of our health as adults, is the condition of our being from the time we are a gleam in our parent's eyes until the age of 4 or 5.

In order to have the healthiest adult life, the conditions in early life, especially while you are in your mother's womb, and for the first few years outside, are the most critical ones for our health as adults. This is fantastic information for it tells us where we must act to produce health.

Epistemology, is a fancy word for how we come to know things. How do doctors come to know what they know about health. In medical school, I was taught physiology, how the body works. My daughter was taught the same thing this year in grade 10. On what basis did we learn how the body works? From the references in my student physiology book, I find that the studies were mostly done on dogs. At Stanford Medical School back in the early 1970s where they perfected heart transplants, much experimenting went on in dogs. The animal rights people get upset about this, and to them I suggest that they join the human rights people in drawing attention to the experimenting going on in humans in this country and in the world at large where we are creating so much experimental poverty to see how it affects our health. In 50 years time people will look back on this era and be horrified at what we did, just as today we are aghast at the Tuskegee experiments that took place only 40-50 years ago where we didn't treat African-Americans with syphilis as we wanted to study progression of the disease.

What we know about how human bodies work comes from various animal studies. These results are then evaluated to see if they explain the common findings in humans. Some animal studies don't appear to translate to human findings, but many do. It allows me to decide how to investigate illness as a doctor and to prescribe treatment. If you are hemorrhaging and we replace your fluids, you survive, something we learned from bleeding dogs. The results of such animal experiments are routinely accepted. There are others that are overlooked for strange reasons. Many of the overlooked studies dwell on various behaviors, rather than physiological parameters such as blood pressure, or glucose levels.

One example I first learned from Michael Meaney at McGill University concerns mother rats. Studies on rats show that

mothers who lick and groom their pups, their babies, will have those pups lick and groom their babies when they become mothers. For mothers who don't lick and groom their pups, when the pups grow up and have their own babies, they don't lick and groom them. If the pups are isolated from licking and grooming mothers and not licked and groomed, then when they become mothers, they don't lick and groom their pups. And vice-versa, pups from non-licking and grooming mothers who are licked and groomed by other rat mothers will lick and groom their babies when they become mothers. Nurturing behaviors appear to be transmitted in non-genetic means. Epigenetics describes how this happens but is yet to be taught in school. This example points out the importance of what happens soon after birth and how that affects subsequent generations.

The biology behind this has two facets. One relates the stress that you and I experience, and its hormonal manifestations. The other to what happens in the brain, which is also related to the stress of society.

We have a physiological system that responds to imminent danger by fighting or fleeing, the so-called fight or flight response. It is mediated by cortisol and adrenaline produced in the adrenal gland. These substances ready your body to succeed in escaping the danger. They save your life. But produce these chemicals most of the time while stuck in traffic, or mad at your boss, or worrying about paying bills, and they turn out to be responsible for half of the diseases of modern society, from diabetes, to high blood pressure to heart attacks.

I'm impressed in studies on pregnant sheep and their offspring demonstrating the importance of stress in the womb. I'm not sure why sheep are such a good animal to study, but you've probably all heard of Dolly, the first cloned animal who was a sheep. Studies show that the fetal lamb secretes cortisol in response to stress, whether it is getting inadequate nutrition or not enough oxygen or whether the placenta is behaving badly and allowing mother's cortisol from her own stress to reach the fetal lamb. So the fetal lamb has to deal with its own cortisol production from being stressed, as well as its mother's, and then its own cells are sickened by both. With too much cortisol Hamlet might say we are more susceptible to "the thousand heartaches and the natural shocks the flesh is heir to" and the lamb more quickly "achieves the sleep of death." This same endangerment occurs in humans. There is a vast scientific literature supporting the concept that what matters for our health are conditions early in life, especially those associated with stress.

What happens between generations? Irv Emanuel, a colleague of mine at the University of Washington, studied the importance of these early factors. He has been interested in health outcomes that depend on our mothers and grandmothers. He showed the importance of the maternal grandmother in our health. To paraphrase Wordsworth, "the daughter is the mother of the woman." To understand what impacts the woman, we have to look before her mother to her grandmother's situation. By creating good conditions for your daughter, she will beget healthy grandchildren! It will take generations.

Another component to the stress response has not been prominently featured in either high school or medical school curriculums, namely the "tend and befriend" or "calm and connection" response mediated by another hormone, oxytocin produced in the brain. The only thing I ever learned about

oxytocin as a doctor was that it expelled stuff, either uterine contents when I wanted to induce labor, or breast milk. It turns out to have a vast repertoire of other actions. I wonder if the reason it has been overlooked is that it tends to be more active in women, and it's men that do the studies. Men produce just as much of it as women, but testosterone inhibits its effects while estrogen promotes it. So faced with an emergency, what does a woman do? She takes care of others, tends to her child, instead of abandoning it to the attacker or threat. Oxytocin is a neurotransmitter in the brain and is released during sex, massage, gossiping, trusting and many other situations that are good for us. There is likely much more of this chemical around in more caring and sharing societies and it might be a factor in the licking and grooming of rat pups. While I can quote studies that demonstrate higher cortisol levels in less caring and sharing human societies, we don't yet have population studies with oxytocin.

The lower down you are in society's pecking order, the lower your income, status, wealth, job rank, education level, skin color, accent, the more cortisol you produce. As the sheep experiments show being a poor pregnant mom under stress, more of your cortisol gets into your baby, and so the baby is born not on third base, it often doesn't even get to first base. It stumbles as it leaves the plate after a bunt. The science is clear: we are not all born equal. Those from more disadvantaged early life situations are already slated to be less healthy at birth and to become sick later. This is evident from their having low birth weights and being born prematurely which are both highly correlated with adult disease. All this happens before birth. What about after?

The Institute of Medicine's treatise, "From Neurons to Neighborhoods: The Science of Early Childhood Development" talks about brain plasticity, namely the forming and reforming of neuronal connections in early life based on social and environmental influences. Soon after birth, the visual cortex, the part of the brain that processes visual images is busy being sculpted. The most important reason is what British psychiatrist John Bowlby termed secure attachment on a familiar face that allows the infant to venture forth from a secure base to explore the world, knowing the face will be there when she crawls back. Eye contact is important here and we are the only primate species with whites in our eyes so the infant can know whether the attachment figure is looking at her. The report, "From Neurons to Neighborhoods," points out that children who are not securely attached to a caregiver in early life have higher cortisol levels. As adults, such individuals are more likely to have worse mental health and depression. This is related to depression in the mother and associated with cortisol.

Around the first year of life, the auditory cortex is busy, processing sound and developing language skills. The range of vocabulary and content is vital for later success at school and avoiding behavioral problems later in life. If all you hear are cease and desist orders, namely stop that, shut up, don't do that, you won't do as well as an adult than if you were exposed to an engaging diverse vocabulary. Creating a nourishing early language environment is very important for adult health.

The frontal lobes of the brain are very plastic from around age two until teenage hood. The frontal lobes are our social organ. Play, sharing, looking out for one another and

understanding social cues is what this period of development is all about.

We have cohort studies, which follow children from birth into adulthood. These demonstrate the profound importance of early childhood conditions on brain development, success at school, and adult health.

To quote the Feds, in "From Neurons to Neighborhoods:" "Of all aspects of children's early environment, the family's socioeconomic status is most powerfully associated with children's cognitive skills when they enter school. The influence of socioeconomic status during early childhood years appears to be stronger than SES in later years." It is the steepness of the slope upstream at the source that matters most. They write that "Children in single-parent families are at greater risk for poor developmental outcomes." As well, they point out that "Stress resulting from marked threats to physical or psychological well-being can have dramatic effects on health and development." And: "Psychosocial risks that affect maternal behavior include poverty, family violence, and maternal depression. Supportive and nurturing care giving can help protect offspring from these adverse outcomes."

Why is this important for us in the USA? I said that our health was worse than that in the other rich countries, and that for the first time since 1958, our infant mortality rate, a very sensitive indicator of our health as a society is rising. This is very troubling. A French demographer, Emmanuel Todd, noticed such a rise in the infant mortality rate in Russia in the early 1970s and wrote a book in 1976, *La Chute Finale* in which he predicted the collapse of the Soviet Union for just those reasons. Our CIA, the Central Intelligence Agency, monitors infant mortality rates in parts of the world to see where the next trouble spot will be. Our new intelligence director John Negroponte is certainly kept informed of our infant mortality rise and our decline as a society.

If early childhood is this important, then what do we do to foster good child rearing in the USA? When does society exercise responsibility for childhood? The only time the state legally intervenes is to make sure you have your vaccinations at age 5 to go to school. Before that it is a free-for-all. By age 5, the die is cast and getting your shots is not going to make up for a disadvantaged time in your mother's womb or the struggles of the first five years of life. All of us have some of this early baggage to live with and I'm not saying you should not do what you can now to better your health. I want you to listen to the advice I give if you see me in the ER, because I think it still matters. But I want you to recognize the importance of what happened before we were in a position to make individual choices. We have to structure early life in society for better health outcomes.

We have the highest teen birth rates of all rich countries, twice the rate of the next closest country and that gap is increasing despite a slight decline in our teen birth rates. The gap between the rich and poor is related to teens giving birth, where there is a bigger gap, more will have children. We also have studies demonstrating that when teens are reared by a single parent, usually a poor mom, they will initiate sexual activity earlier and get pregnant sooner than if they are in a two parent family. The reason is clear, life is precarious, you won't live that long, so begin your family earlier even though it will be

a tough life. This is usually not a conscious decision, but one made subliminally to adapt to the environment.

Studies demonstrate that being raised in a single parent family is not only harmful for the parent's health but also bad for the child's health. Children raised by a single parent not only have more sickness, illicit drug and alcohol problems, and suicide attempts, but a greater chance of dying than children raised in a two parent family. Any parent can attest how difficult it is to raise a child these days. It is harder to do it alone.

I could go on and on presenting depressing statistics about how unhealthy we are compared to people in the other rich countries, and some poor ones as well. But it is time to think of solutions. The cause of our poor health is that we have given up our sovereignty to decide what is best for you and I in this country. We have been led to believe that as individuals we can achieve any level of health or prosperity we want, we just have to pull up our bootstraps. The problem is that many of us no longer have bootstraps. We gave those away to the rich and powerful some time ago. We have to take back our collective bootstraps. Where are we going to find them? Let's look in some other countries that are healthier than we are to see how their bootstraps work to pull people up.

Let's take Sweden, the second healthiest country in the world. Sweden is a very diverse country, with over 10% of the people living there being born outside of Sweden, comparable to the US rate. Swedes pay high income taxes and have a wealth tax to supply funds for social purposes. It is a decision they made, namely recognizing that everyone does better when everyone does better. They understand the importance of early childhood. In Sweden you have to take a year's maternity or paternity leave at full pay. You can't get out of it. After the first year, you can take an additional year of leave at 80% pay. After that if you return to work, then your child can be placed in a government run free daycare. The requirement to work in a Swedish daycare is that you have to have a master's degree in play. The daycare experience is about, learning to play with others. Such conditions give your child the chance to develop secure attachment, be exposed to a rich vocabulary and socialize with peers. It doesn't guarantee this will happen. But it makes it more likely and the fact that child and adult mortality in Sweden is so low compared to the US attests that it works.

Notice that I have said nothing so far about the role of health or medical care in producing health, despite the fact that I work as a doctor in emergency rooms. There are no data that support health care as it is done in the US, at least, as having a positive impact on our health. The reasons why are a whole other talk, but I mention it here just so you don't think I forgot an important piece. Health and health care sound synonymous but they are not. Medical care is invested in disease, and our abilities to discover disease are so sophisticated now that I can say with certainty that if you think you are healthy, you haven't had enough tests yet. We can find disease in anybody, but I'm talking about health. Respected sources, such as the *Oxford Textbook of Public Health* and others back me up on this seemingly unintuitive concept. I'm not suggesting you don't receive medical care when you need it, but don't look to health care to make a population healthy.

Let me move on and ask how are we going to produce a caring and sharing society in the USA and get back on the road

to health? We can begin by overturning pretty well all the recent legislation that gives everything to the rich while we are to be satisfied by what trickles down from them. Greed isn't good for our health. We have to make the choice between greed and good if we want health. If we don't, then we can continue to have ever less so the rich always have more. Maybe you don't want the rich to have worse health because of this. Remember, I said not only is your health impacted by inequality, but that of the rich is as well.

Tax cuts for the rich and for rich corporations are not good for our health. Back in 1940, US corporations paid 40% of our federal tax bill. By 1960, it was 26%, by 1990, 13% and in 2000 only 7%. From 1996 to 2000 during a period of strong economic growth in the US, 60% of US corporations paid no tax according to the general accounting office. In 2003, Time-Warner, for example, made 4 billion, 224 million dollars in profits and paid no income tax. We can change that for we the people, as I said, make the laws in this country. The intent to permanently repeal the estate tax is another example of legislation that we should not allow for it will be bad for our health if enacted. President FDR said that both inherited power and inherited wealth were inconsistent with the guiding principles of this nation. Our highest personal income tax rates used to be 91% when we were one of the healthiest countries in the world. Now they are 35% and our relative health decline mirrors the drop in tax rates for the rich. We live amongst a few Hood Robins that take from the poor and give to the rich.

We can have a maximum wage, just as we prescribed for Japan when we wrote their constitution in 1946. At that time the maximum wage was set at 65000 yen in Japan. Today the boss in Japan makes ten times what an average worker makes while ours makes 531 times. Last year in the US, the average wage for CEO's, the Chief Ego Officers, was 110 million dollars, and in some recent years it has been up to seven times that. Pay for the boss in the last decade has tripled, while corporate profits have only doubled, and worker pay only went up 49% with inflation eating up pretty well all of that gain. The average worker is dying for a living. President Roosevelt a Democrat, put forth legislation in 1942 to create a maximum wage for the US of \$25,000 a year at that time. We could go back to that kind of regulation, since we almost had a maximum wage then.

President Nixon, a Republican, proposed a negative income tax in his Family Assistance Plan of 1969. He said there would be a guaranteed income for every family with children. Newspaper support was 95% in favor. It passed the House of Representatives and languished in the Senate as Nixon became embroiled in Watergate. We could revisit that legislation. Enacting it would help cope with the large numbers of homeless children that were not present back in Nixon's time.

The medicine we need to produce health is one we used to take or considered taking in the past, so we could compound it again in our political pharmacy. Trickle-down politics is no better than trickle-down economics. We must see that we the people are the source of power, we are our population health doctors and we need to take that power back. We can only do it by becoming aware of what makes a population healthy and taking steps to produce health in ourselves. We don't need more research on this. Asking for more research can be a way of

subverting political action. If the goal is becoming healthy, we know all we need to know.

The material I have presented can be considered a new paradigm for looking at health. Our history is replete with scientific revolutions and something that commonly occurs with revolutions is what can be termed a "professionalization" of the old paradigm. As a medical doctor, I find doctors are the most resistant group in this country when it comes to trying to produce health. We love the old treating disease model for that creates immense profits. We are very resistant to the ideas I have described. MDieties do not want to think of changing our disease perspective because we are comfortable with it even though we die much younger than we should, at least compared to people in about 25 healthier countries. Our health in this country is so far behind others, that even if we eradicated our leading cause of death, heart disease, we still wouldn't be the healthiest country in the world. There is no MDeity out there that could contemplate winning the war on heart disease as a possibility. But that shows how much our health has declined. The USA used to be one of the healthiest countries in the world, back when we cared and shared. We can go back to those values of caring and sharing. We need to discard greed in favor of good.

I've talked about our health as people, whether in the womb, as children, adults, or getting nearer to the tomb. Benefits extend far beyond our species, to the physical environment. Studies show that where the gap between rich and poor is smaller, the rape of the physical environment is less. Equity and good ecology are almost synonymous. You may think I'm espousing a one-size fits all perspective. If the goal is a sustainable planet, caring and sharing works. If the goal is wealth creation and all of us dying young, then we just need to continue making the rich richer.

Some folks will say these ideas are all nonsense. How do we come to know things in our travels from womb to tomb? In the past, we used to ask our parents, talk with teachers, ask our friends what they think. These days we Google and in 0.21 seconds, we are presented with 1,593,254 hits for just about anything. I find this incredibly under-whelming as a way to learn. We get too much information and our brain shuts down, as we don't want cognitive dissonance, and go back to business as usual.

I am proposing to you here tonight that if the health of your children is important to you and if the health of your unborn grandchildren is important to you, then you must become familiar with the ideas presented. Don't take my word for it, find out for yourself if they are true. The illiterate of the 21st century will not be those who can't read or write, but those who can not learn, unlearn and relearn. Verify the statements from the Institute of Medicine's various reports which available for free on the web. Then delve into other scientific literature. Go to our Population Health Forum's website, which is a diverse source of materials. It may take you a while to become convinced, just as it did me. You can then teach what you have chosen to learn. Get other people thinking about this question. Band together to organize, and change the rules in this country that determine who gets what share of the pie. Inequality hurts everyone, including the rich, and it is time to redress that. But the rich and powerful won't give up easily and will try to subvert you.

An example of how the rich and powerful subvert you is provided by Martin Luther King Jr. He tried to carry out the Poor People's Campaign in 1968 to get a half million citizens camping on the mall in Washington, DC to press their legislators for an economic bill of rights

As citizens, we need to look at existing policies in this country and new ones proposed to see what they do to the gap between the rich and poor. If they increase it, then we can expect worse health outcomes. If they decrease it, then we can count on a longer time between womb and tomb. We can only influence existing and forthcoming policies by working together to understand their health effects and to help others recognize this. Such organizing begins in our communities. The way to fight organized money is with organized people.

Recently a group of us met with our local congressman to get his take on the forthcoming CAFTA or Central American Free Trade Act, which like NAFTA demonstrated, promises to be bad for our health because it allows the rich to take even further advantage of the poor. The politician felt that unless we can turn out huge numbers of people such as Martin Luther King Jr. used to do to support the defeat of this legislation which hurts everyone, the likelihood of it passing are high. This is the challenge ahead.

To summarize, I have pointed out that we as citizens in the US are less healthy than people in all the other rich countries, and a few poor ones as well. Fifty years ago we were one of the healthiest countries in the world, but as we have lost interest in governing ourselves, and allowed those with wealth and power to further concentrate their wealth and power, our health compared to other nations has declined. All of us, rich, poor and vanishing middle class alike pay the ultimate price for living in the richest and most powerful country in world history, we live less happy lives and die much younger than we need to. If we accept that it is better for the rich to have everything and for them as well as us to be so unhealthy, then all is well and we can continue hanging on to the steep slope at the source. We could decide that we actually desire a long life, shared liberty and happiness rather than just its pursuit. Then we have work to do to gain back our sovereign rights to determine our well being.

We cherish our democracy, or at least we talk about it, but mostly follow Benjamin's Law: when all is said and done, more is said than done. We are not aware of how much work it takes to have a democracy. It means much more than voting once every four years. Even then, we have the lowest voting rates of all countries. Plato said 3000 years ago that for a democracy to function, the richest person should be no more than four times as wealthy as the poorest. Today that is close to a trillion to one, or a million to one.

So we don't have a functioning democracy in this country, at least one where we the people do much work in deciding who benefits from the policies that are enacted in United States. Democracy is not what we have, democracy is what we do. Democracy is hard work, it takes lots of time, and can be painful to do well. We feel we are too busy to work in the democratic process. It takes too much time to understand the issues and to work together. If we take the time for democracy, we will more than make up for it in added years of productive enjoyable life. What a fantastic investment in ourselves, our children and our grandchildren.

If well-being is important to you you will have to work to improve our health for the rest of your lives. There is no quick fix, no way to check a box on a form and send it in and all will be well. Each of us must inventory our skills, interests and energy and act in concert with those. If you do what you enjoy doing and what you can continue doing for a long time that addresses the big picture of health, then it will make a difference for this country. Personally I try to develop curricula for middle and high schools so that our young people will learn the need to make group decisions for our health. They need to see that being healthy is not an individual matter, but something that a society decides. For the young here tonight, ask your teachers about these ideas.

I also write for audiences from the homeless to academics and teach at the college level. It is difficult to make a living in this country espousing economic justice so keep your day job. After tonight, I want each of you to extend a hand to 3 others on the steep slippery neo-liberal slope of trickle-down economics and tell them what you learned tonight, and how it affects our health. You may never know what results come from your actions, but if you do nothing, there will be no results. One person, working alone, will not help that much. We need solidarity sharing our efforts with one another. "If you give me a fish, you have fed me for a day. If you teach me to fish, then you have fed me until the river is contaminated or the shoreline seized for development. But if you teach me to organize, then whatever the challenge, I can join together with my peers, and we can fashion our own solution." If we organize then the upstream source of the problem will vanish and people won't be sliding into the river! And we will all enjoy a much healthier and longer time between womb and tomb. Thank you.

For more info –
Population Health Forum website
<http://depts.washington.edu/eqhlth/>

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Other AR programs –
Stephen Bezruchka - "Health & Wealth"
Bill Moyers – "In Defense of Public Broadcasting"
Lester Brown – "Plan B: A Blueprint for People & the Planet"
Chalmers Johnson – "Blowback: Impacts of the New Militarism"
Arundhati Roy – "The Checkbook & the Cruise Missile"

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