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ALEX MAIERSPERGER: The number one cause of cancer today is smoking, but that's about to be overtaken by the second leading cause. What role does race play in cancer outcomes? And if you spend more on cancer screenings, do you always save more lives from cancer? The answers may surprise you. [MUSIC PLAYING]

We're bombarded with cancer information. There's new cancer drugs, new cancer screenings, foods we're supposed to eat, foods we're not supposed to eat, amounts of exercise we're supposed to get. I'm your host, Alex Maiersperger. Today, on The Health Pulse podcast, we welcome someone to help us learn what we can do and maybe where we can live so we don't get cancer, Dr. Otis Brawley, Bloomberg Distinguished Professor of Oncology and Epidemiology at Johns Hopkins University. Welcome, Otis.

OTIS BRAWLEY: Hello. Thank you for having me.

ALEX MAIERSPERGER: You've referred to yourself as the Forrest Gump of cancer research. Can you tell us what that means?

OTIS BRAWLEY: Yeah, it's just acknowledging the fact that I've had a very blessed and fortunate career. I grew up in the inner city of Detroit, and I got to go to a really good college and medical school and trained in medicine at a really good place and then in oncology and epidemiology. And along the way, I've had a number of interactions with very famous people in medicine. Larry Einhorn, the guy who cured testicular cancer, the first cure of a solid tumor is a personal friend of mine. Vince DeVita, the guy who developed the treatment for Hodgkin's lymphoma, is a personal friend of mine.

Along the way, I got to work for a surgeon general. I got to be a staffer for several years. I got to be involved with President Clinton's apology for the Tuskegee syphilis study, had a wonderful opportunity to run a cancer center in Atlanta and meet a lot of very interesting people and learn a great deal about both oncology as well as the economy, and politics, and government, got to spend almost 12 years as chief medical officer of the American Cancer Society, which was just a wonderful opportunity. I've just been very blessed and had the opportunity to be involved with some really important things as cancer and cancer research evolved over the last 35 years.

ALEX MAIERSPERGER: I imagine how many people are on the other side of those stories telling those same stories about you, saying Otis Brawley is a personal friend of mine. So incredible to have you here. Thank you so much for your time. There's a lot of talk right now about maternal death rates, particularly among Black women. There's similar discussion in cancer rates and deaths. Part of that discussion includes the role of race in cancer and cancer outcomes. What has your research shown in the disparities that exist?

OTIS BRAWLEY: Yeah, we've looked a great deal at the disparities as they were in regard to cancer. Most of the disparities by race are because of race by socioeconomics. One thing that worries me a great deal is a lot of people think that there are biological differences amongst people who are of different races. There are biologic differences amongst people by area of geographic origin but not by race.

For example, when we look at prostate cancer rates and we hear a great deal that Black men have very high prostate cancer rates, that's true of Black men who originated in Northwestern sub-Saharan Africa, but not as true among Black men from eastern Africa or from southern Africa originally. When we talk about race as a socioeconomic factor, we can definitely say that if you have a population of people who are Black compared to a population of people who are white, the Black population as a whole will have more poverty in it. And poverty is a carcinogen.

As another friend of mine who's a very famous oncologist, Sam Broder, used to say, poverty is a carcinogen. And it's the socioeconomics of poverty that causes those cancers and causes not only the cancer but also causes the bad outcome.

A lot of what I have done are studies comparing various populations in different socioeconomic situations. For example, we find that Black women who are either in the military or retired from the military, married to people who are in the military or retired, have breast cancer death rates very similar to white women who are in the military. And by the way, they both have death rates that are lower than the average in the United States because they have access to care and know how to utilize and get that care.

When we look at Black women with breast cancer, for example, we've noted that the death rate-- and I hate to use numbers, but I have to use numbers to show these examples. The death rate for Black women in Massachusetts is somewhere in the neighborhood of 18 or 19 deaths for every 100,000 Black women per year from breast cancer. But if you go to Louisiana or Mississippi, the death rate is 32 or 33 per 100,000.

You see, it's not race as much as it is the socioeconomics and the environment that is associated with the socioeconomics. And so we spend a lot of time trying to unpeel the difference between race and discourage people to use race as a surrogate for genetics, which we hear so often. Not too long ago I heard at the beginning of the COVID epidemic that Black people don't get COVID. And that sort of discussion comes out of some racist blinders that even some of us who are Black have in the United States. And we need to try to get away from that and actually look at the true causes of these diseases and then look at the true causes as to why some people get less than optimal care.

ALEX MAIERSPERGER: You talked about that experience that you've had, and it clearly shows in the answers that you give around political, and economics, and the clinical site of care, and the research site of care. You wrote a book with a controversial title, *How We Do Harm*. Speaking as a physician and that sometimes there's overtreatment or overscreening of disease, it seems like every day now I see a celebrity touting a new full body scan company. Do these play any role in a healthier future?

OTIS BRAWLEY: Yes, but. I'm very concerned-- many people don't realize just how resource constrained we are in the United States. We can't spend all of our money on health care, but it seems that there are some people who want us to. And then when we start talking about health interventions, there are health interventions that are a big bang for the buck, meaning we can get a great deal out of them. And then there are health interventions that cost a lot of money. And some of them cost a lot of money and are actually harmful.

And we need to try to do the things that actually are scientifically proven to work and stop doing the things that are not scientifically proven to work. You were talking about some of these screening tests that are advocated by celebrities. Many of them are not scientifically proven. Many of the treatments that I hear out there advocated by celebrities are not scientifically proven.

And then when I look at my own profession, and this was what the book was about, there are a lot of doctors who forget the fact that we are scientists, and we are supposed to be applying that science to the population. And you end up with a lot of doctors who confuse what they know scientifically, what they don't know, and what they believe. And it's very dangerous when somebody starts confusing what they believe with what they know. And so we've seen over the last 50 years in medicine, lung cancer screening with chest X-ray, which was very popular in the 1960s until we finally got around to doing the scientific studies and finding out that it did not work. We hurt a lot of people through lung cancer screening with chest X-ray.

Now we've come back and looked at lung cancer screening with a newer technology, spiral CT. And we actually find that spiral CT screening of people who have an extensive smoking history actually saves lives. Now, that study, by the way, showed that it saved lives. And a lot of people stopped at that point. Actually, if you look at The New England Journal paper, go to table 4 and table 6, it shows you that for every five lives that it saved, one person died in the diagnostic process. And so to a professional screener like me, it's for every five lives you save, you sacrifice one. And that's actually the reason why all the major organizations that have made a statement on lung cancer screening don't say people who have extensive smoking history ought to get screened. They say people who have an extensive smoking history ought to have a conversation with a physician, understand the potential risks, and there are some, people died, and the potential benefits, and there are some, people lived, survived, their lives were saved. And those people need to weigh what their concerns are in health care and make a decision. Is screening right for me? And I'm very into informed decision-making in the realm of lung cancer screening, also in prostate cancer screening.

I'm not against prostate cancer screening. I'm against telling people we have large numbers of studies that definitively show that it saves lives. That's not true. We have studies that suggest that it saves lives. We also have studies that show that there are some harms associated with it.

And, again, not just Otis but all the major organizations say that in the case of prostate cancer screening, the patient needs to have a discussion with his physician, weigh the pros and cons after understanding the pros and cons, and make a decision as to whether they should be in a prostate cancer screening program. I'm not against prostate cancer screening. I'm against saying it's better than the science actually proves. I'm for informed decision-making.

And while we're talking about screening for breast, and prostate, and lung cancer, and other things, frequently our message is get a mammogram. Our message really should be get into a program of routine, high quality mammography. The message should not be get a mammogram. And while we're talking about mammography, one of the harms I've talked about there is I hate mammogram vans. Mammogram vans are very popular. A number of hospitals have them. They love to have their name emblazoned on them. The message from a mammogram van is get a mammogram, not get into a program of routine, annual, or every two year high-quality mammography.

And the second thing about mammogram vans is most mammogram vans never even try to find previous mammography. Now, we've defined high-quality mammography as looking at last years and the year before and comparing it to this year. In mammogram vans, that rarely happens.

So a mammogram van 80% of the time in the United States is low-quality care. It costs a lot, but it's low quality. I'd much rather see those women getting their mammograms in high-quality programs of routine

screening done in bricks and mortar facilities where the radiologists find the previous mammogram and does that comparison.

ALEX MAIERSPERGER: You are the celebrity that I'm going to be sending people to for the thoughts on screening. So thank you for dispelling some myths. And I love the pragmatic approach and the thoughtfulness and willingness to learn and maybe admit mistakes of here's what we knew from the research prior, and here's what we're going forward. And here's how those standards change. That's really appreciated.

It seems like cancer is happening more frequently. Is that because we're looking for it more? Are people really getting cancer younger? Why does it seem like this in the news?

OTIS BRAWLEY: Yeah, that's a really, really important question, especially in the area of colorectal cancer. We are seeing an increase literally of people dying from colorectal cancer in the 1980s, 1990s. 10% were diagnosed in their 40s. Today, 20% were diagnosed in their 40s. So there's a clear rise there. In other diseases and other cancers, there is somewhat of a rise, but it's not nearly as bad as in colorectal cancer.

Now, the first thing that people start saying is what is the reason for this? And that's actually a good point because that actually points us toward prevention, something that we don't think about a lot, risk reduction. One of the problems that we have in the United States is our lifestyle has changed dramatically. In 1970, 5% of kids under the age of 18 were obese. Today, it's about 20%. In 1970, 15% of adults were obese. Today, it's about 40%. Among Black women, it's closer to 70%.

Many people don't realize that the number one cause of cancer in the United States is smoking. The number two cause is what I'll call energy imbalance. Energy imbalance is a three-legged stool, consumption of too many calories, not burning off those calories through exercise, and then storing those calories. Storage of those calories is obesity.

And so this energy imbalance epidemic, which is increasing dramatically over the last 40 to 50 years, is the second leading cause of cancer in the United States. And as tobacco smoking rates are going down, energy imbalance is going to become the leading cause of cancer by the end of this decade. So we've got energy imbalance issues, people getting fatter and fatter, less exercise that are increasing some of these cancer rates. They're especially pushing up some of the breast cancer incidence rates, but they are truly pushing up the colon cancer rates.

Now, some of the colon cancer increase in younger people I've just explained to you. There are undoubtedly some other reasons. We're speculating and still doing research. We think some of the use or misuse of antibiotics over the last 30, 40 years has caused a change in the bacterial flora inside the colon.

We're studying a lot of the microbiome, that is, the bacteria in stool and in the colon. It's changed in content and texture over the last-- or I should say, it changed in content over the last 40, 50 years in much of the population because of the overuse of antibiotics.

When we look at our diet, it's not just high calories. We're eating a lot of processed foods now. And those processed foods have changed some of the biochemistry within the crypts of our colon and maybe some of the reason for colorectal cancers to increase. So we need to think about risk reduction. I've been very obsessed in some of my writings recently with Costa Rica, Costa Rica versus the United States, an amazing comparison.

People in Costa Rica, the life expectancy is two to three years greater than the United States. They spend a little less than \$1,000 per year per person, or I should say \$1,000 per person per year on health care. We spend about 14,000 per person per year. Their cancer death rate is about half ours, and they live two to three years longer than us on average. But they don't spend a lot of money on health care. The reason is they prevent the disease before it occurs. So they don't have to pay to treat it.

5 to 9 servings of fruits and vegetables per day is what's recommended by the Department of Agriculture, the FDA, and the National Cancer Institute. I just read a paper this morning that says 15% of Americans eat at least three servings. Now, every man, and woman, and child should eat 5 to 9, but only 15% of us eat 3. And we need to focus much more on risk reduction and prevention of disease.

ALEX MAIERSPERGER: I'm immediately searching flights to Costa Rica, seeing if I can append family life. It sounds like we're in a little bit of an individual and societal mess. What role does data and technology play in getting us out of this cancer mess?

OTIS BRAWLEY: Data and technology is incredibly important. I've been citing data throughout this entire talk. When we look at the death rate from breast cancer among Black women in Massachusetts being 18 or 19 per 100,000 but it's 32 or 33 per 100,000 in Louisiana and Mississippi, that's data. We need to ask why. And the answer there, by the way, is people in the South, especially the Southern states, have much poorer access to high-quality care than people in the Northern United States.

There's actually some great studies, by the way to show that the Massachusetts health care plan, Romneycare, is now responsible for those low death rates or partially responsible for those low death rates in Massachusetts. And, of course, a number of states in the South, like Mississippi and Alabama, Georgia, have not expanded Medicaid. So a large number of people don't have access to high-quality care. They just don't have the insurance to pay for it. And they're dying because of it.

By the way, I should point out another data point. This is probably the most important paper I've done in my 35-year career. We were able to look at the fact that the death rate from cancer in Utah is 125 per 100,000, and the death rate from cancer in West Virginia and Kentucky is 185 per 100,000.

And we were able to look at the fact that college educated people are half as likely to die from cancer versus people who are not college educated. And we were able to say of the 600,000 people who die every year from cancer in the United States, 132,000 are actually preventable deaths. If we gave everybody optimal therapy from prevention all the way through appropriate screening, appropriate diagnostics, and appropriate treatment, we could prevent 132,000 deaths out of the 600,000 that occur from cancer every year.

And when I started doing my epidemiologic studies, we used to focus a great deal on minority health. We figured out of the 132,000 deaths that could be avoided every year, the disparity, 80,000 are white. The majority of people who suffer from health care disparities in the United States are white Americans.

It is true that a Black American or Hispanic American is more likely-- this is the sociopolitical definition. It is true that Black American or Hispanic American, or Native American is more likely to suffer from cancer health disparities. But the largest number who actually do are white, and the solution is to get people adequate high-quality care, be it prevention, appropriate screening, and there's a lot spinning our wheels in the sand doing screening that doesn't matter and not doing screening that does matter, appropriate screening, appropriate diagnostics, and then appropriate treatment. And we need to focus on all of those aspects. So, frequently, we focus on small differences between Blacks and whites.

And, ultimately, we're all human and we all deserve to get appropriate care, so I think the answer we should be looking for. So that just gives you some ideas of how we can look at the data and figure out what the problem is, and then we can look at the data and figure out what we need to do.

Just to give you another piece of data, we've had a 50% decline in colorectal cancer deaths in the United States from 1980 to 2020. Just think about that. The risk of dying from colorectal cancer-- now, this is for all people, not just people who are young, in their 40s. The risk of death has halved. That's a wonderful thing.

Now, that's the United States as a whole. We've averaged across the entire United States. There's 65% decline in death rate in Massachusetts and a 20% decline in Mississippi.

Now, again, getting adequate care to all people is incredibly important. And we really need to change our aspect and our outlook toward one of preventing disease as well as getting people adequate treatment once they get the disease. So when I say get people adequate care, I'm talking about a spectrum of adequate prevention, risk reduction. Some of that's coaching on what you should be eating and how you should be exercising and not smoking. Appropriate screening. And there are some screening tests that we all should be getting. And then appropriate diagnostics and treatment.

ALEX MAIERSPERGER: I feel like I need to be taking furious notes here. I'm learning-- on the technology side, is it purely a bet that we're going to be developing better drugs or cures, or are there other ways that technology is going to help us predict and mitigate some of this risk?

OTIS BRAWLEY: Technology is already helping us figure out people who are at higher risk for certain diseases, so we might be able to intervene and prevent those diseases. There's actually some FDA approvals for several drugs for prevention of breast cancer amongst women who AI and computers can tell those women you are at higher than normal risk of getting breast cancer. Some of those women might take those drugs, might also get into more intensive surveillance or screening protocols because they're at higher risk. As time goes on, we're learning a great deal more about cancer. We have totally redefined what cancer is since Richard Nixon signed the National Cancer Act of 1971.

In 1971, we thought cancer was a metabolic issue. In the 1970s and '80s, we started realizing it was a genomics problem, a genetic genomics problem. And now that we see cancer as a genetic disease, we've actually figured out that there are various things going on inside the cancer cell that we can interfere with various drugs. We've figured out that there are markers or receptors on the cancer cell that we can sometimes manipulate with various drugs. I'm now starting to talk about precision medicine. For example, the estrogen receptor is very commonly found on breast cancer cells, and we can block the estrogen receptor so that estrogen can't stimulate the cancer to grow. We have drugs for that. Those drugs were developed first about 40 years ago, and they've gotten even better and better. We have drugs that can interfere with various growth factors.

Indeed, the EGFR mutation in lung cancer was discovered 20 years ago this year. It was May of 2004 that we learned about the EGFR mutation in lung cancer. And the first drug to help interfere with that was Iressa and Tarceva. And now there are several other drugs that are sons of Iressa and sons of Tarceva out there. And that has actually-- it's the first treatment in lung cancer that's actually lowered the death rate in lung cancer.

Prior to that, the death rate in lung cancer was going down because of smoking cessation that occurred 30 years earlier. But now we have-- I was just talking to one last week. We have people who've had metastatic lung cancer, and they're alive for 18 or 19 years because of these drugs. In 2003, people of

that stage had a life expectancy of less than two years. It's still the exception. But it's becoming less and less the exception over time that we have these long-term metastatic lung cancer survivors.

And that's because of precision medicine and our understandings of what's going on in the cancer cell. Therefore, we understand a little bit more about what we can do to interfere with what's going on in the cancer cell. And the result is people are not dying, which is a good thing.

ALEX MAIERSPERGER: Incredible progress and incredibly exciting. I'm going to get selfish here for a minute while I've got you. Knowing all that, you know, if moving to Costa Rica immediately is impractical, what's something that I can practically do to avoid getting cancer?

OTIS BRAWLEY: Yeah, now this is where practice what I say and not what I do. If you want to optimize your chances of not getting cancer, well, first, I should tell you that cancer prevention and risk reduction is most effective as in pediatrics. Keeping our kids thin, keeping our kids on a high protein diet with good exercise habits, making sure our kids don't start smoking, those are the most important things that we can do because that's going to prevent them from getting cancer in their 50s, 60s, and 70s.

Now, those of us who are past high school, the best that we can do is try to maintain an ideal body weight, try to get some regular exercise. It can just simply be walking for 30 minutes three or four times a week, but doing some good exercise, 5 to 9 servings of fruits and vegetables per day, not smoking. Those are the most important things.

Alcohol is a carcinogen. It does cause people to get cancer. So try to abstain from alcohol or minimize consumption of alcohol. Binge drinking is certainly very bad.

When I was at the American Cancer Society, I used to do Larry King Live. I did his show probably a half dozen times. We used to talk a lot about cell phones. And he loved talking about cell phones. And do cell phones cause cancer because he got lots of viewership? When we went to commercial, there was always this joke that we used to talk about that's incredibly important to your listeners.

The World Health Organization, which is the United Nations health agency, their cancer subsidiary maintains a list of things that might cause cancer, things that probably cause cancer, and things that definitely do cause cancer. Now, on your list of things that might cause cancer are cell phones might cause brain tumors. It's a might. But on your list not of things that probably but things that definitely do cause cancer, the list of carcinogens from the International Agency for Cancer Research of the World Health Organization, on their list of things that definitely cause cancer, red meat, processed foods. We're all worried should we be using our cell phones, but we have no problems with eating a steak.

Truth be told, we need to minimize our consumption of red meat, not just beef but all red meat. In my world, by the way, pork is a red meat. We need to minimize our consumption of especially processed foods and sugar laden beverages. All of these things are not good for our health.

And, indeed, that's part of the reason why Costa Rica does so much better than the United States. You won't find very much processed food there, and you're going to find people who consume at least five servings of fruits and vegetables on a routine basis and have done that throughout their life. And there's very little smoking in Costa Rica.

ALEX MAIERSPERGER: I feel like I've got the marching orders and the checklist. But it sounds like all roads lead back to Costa Rica. As I'm sure your friends and others refer to you in their story of the Forrest Gump of cancer research, I'd say thank you to my personal friend and celebrity guest, Dr. Otis Brawley. Thanks so much for being here.

OTIS BRAWLEY: Thanks for having me.

ALEX MAIERSPERGER: To our listeners and viewers, we know that there's infinite ways that you can spend your time. Thank you for spending a little bit of it with us. If you'd like to join as a guest or join in the comments, please email us, [thehealthpulsepodcast@sas.com](mailto:thehealthpulsepodcast@sas.com). We're rooting for you always.

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