Welcome to Yale Cancer Center Answers with your hosts doctors Anees Chagpar, Susan Higgins and Steven Gore. Dr. Chagpar is Associate Professor of Surgical Oncology and Director of the Breast Center at Smilow Cancer Hospital, Dr. Higgins is Professor of Therapeutic Radiology and of Obstetrics/Gynecology and Reproductive Sciences, and Dr. Gore is Director of Hematological Malignancies at Smilow and an expert on myelodysplastic syndromes. Yale Cancer Center Answers features weekly conversations about the research, diagnosis and treatment of cancer, and if you would like to join the conversation, you can e-mail your questions and comments to canceranswers@yale.edu or you can leave a voicemail message at 888-234-4YCC. This week, it is a conversation about healthcare and preventative cancer screenings with Dr. Reza Yaesoubi. Dr. Yaesoubi is Assistant Professor of Health Policy at the Yale School of Public Health. Here is Dr. Anees Chagpar.

Chagpar Reza, why don't we start off by having you tell me a little bit more about yourself and what exactly it is that you do?

Yaesoubi I am an industrial and systems engineer by training. The origin of industry and systems engineering overlaps with the industrial revolution and the time that we began mass production and the goal was to improve production and manufacturing systems through decreasing cost and improving quality and maximizing productivity. So, that is where the field started. And I got involved in healthcare during my PhD studies, my advisor had funding to study the cost effectiveness of different cancer screening for colorectal cancer through developing simulation models. So, that is what I do, I develop computer simulation models, in which we try to create a computer prototype of a real system, and the goal is to do 'what if' analysis for scenarios that are very difficult or infeasible to implement in real life. For example, if you have a hospital and you would like to know how you can decrease the waiting time, you may consider doubling your staff members, but this is a costly decision and may not be feasible and that is where simulation models can play an important role because you can create a prototype of your system and play with it. You can add your nurses, add your physicians and then see the impact of those decisions on your performance measures. And my research has been mainly focused on developing such models for investigating the impact of different health policy and health decisions or guidelines on the health of a population, and also the resources that we need to implement such policies and decisions.

Chagpar This is incredibly timely I would think in the current healthcare climate where costs are skyrocketing and we are starting to ask the question of how much bang or how much value we are getting for a buck. But, let us talk a little bit, since you mentioned your PhD thesis work in colorectal screening, about that and what you found. Because for our listeners, there are a variety of methods of screening for colorectal cancer, everything from digital rectal exam and fecal occult blood to flexible sigmoidoscopy and/or colonoscopy to barium enema to now virtual colonoscopy, and people have seen the commercial where people are swallowing cameras. And presumably, each of those has varying costs and

varying pickup rates. What did you find in your research?

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Reza It was done about 6 or 7 years ago. Some of these tests that you just mentioned were either not widely available or not available at all. But the screening methods that we considered were mainly FOBT and sigmoidoscopy and colonoscopy. And the main finding was that FOBT and sigmoidoscopy are cost effective. So, if you do not want to invest a lot of money, go with the fecal occult blood test, and if you have more money, colonoscopy would yield much better help overall in your population. So, that was the main conclusion. And then of course, depending on how you use these tests, the benefit of these tests would vary. You might use FOBT while you are 50 years old and then depending on the test result, you may use colonoscopy. So there is a combination also of these tests that you can use and can be even better in terms of cost effectiveness.

Chagpar But presumably, all of these models that you use go into guidelines right, so this is how we get to, you should have a colonoscopy every 10 years as opposed to having it every year. It is because it is more likely that you can still pick up cancers even if you have a colonoscopy every 10 years and that you really do not need it every year and that it becomes cost prohibitive. But for the general public, who are reading about these models and we have seen this in mammography, for example, in prostate cancer screening, there is sometimes a backlash against models that talk about cost. Can you talk a little bit about the balance between cost and value? That is to say, making policy on the basis of cost alone may sometimes be something that the general public will think is absolutely ludicrous, because how can you put a cost on me getting cancer?

Yaesoubi Yes, absolutely. And whether we like it or not, we have limited resources. And different countries fund their healthcare systems differently, whether it is through taxes or premiums, but at the end, we have a limited amount of money that we have to spend and the goal of cost effectiveness analysis is to spend the money we have more wisely. We do not want to spend money on programs where maybe the added benefit in terms of health is trivial. We want to be smart in terms of where we want to put our money and that is what we do in cost effectiveness analysis. In particular, cancer screening cost does not include only the out-of-pocket cost, there are also some indirect causes and also side effects of some of these tests that we also want to minimize. So, I do not think there is anyone who wants to use colonoscopy every month, but then the question is how often should they use colonoscopy, and that is where we rely on modeling and the advantages of modeling is that you can incorporate information and from multiple sources, you can capture the benefit of yours tests on the health of a population. Also, the amount of resources that you may need to achieve the certain level of health that you desire. But at the end of the day, the whole idea behind cost effective analysis is that we have limited resources and we need to be wise about how to consume our resources.

Chagpar I think you bring up a few points that are really critical to hit home. And the first is that it is not just the cost of the test, that presumably each of these tests have other costs, not only indirect cost to the system but also costs in terms of side effects and we also have to look at the incremental benefit. For example,

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in mammography with the latest debate, there has been this whole concept of over-diagnosis, finding cancers at such an early stage that it may not truly impact longevity. And these presumably are things that you look at in terms of colorectal cancer as well.

Yaesoubi Exactly, there are 2 types of errors that we may see, the false positive and false negative. We might use a test and the test may mistakenly tell us that you have cancer. So, there is cost associated both emotional and financial. So, that is again something that we need to take into account. When you talk about costs, we are not just talking about money, we are talking about other direct and indirect causes, and we might need to take a day off to go and have our tests. So we incorporate those costs in our models as well to have a more efficient approach to using our resources.

Chagpar The other question that comes up when you talk about cost effectiveness and the fact that there are limited resources, I can imagine that some of our listeners may be pushing back a little bit and saying, are you really talking about rationing care? How would you respond to that?

Yaesoubi It depends, there are certain controversies around cost effectiveness. It depends on how we define health in our analysis. For example, you might define health as a life year saved, so if your goal is to maximize the number of life years that you are saving through your program, then you might favor, for example, children as opposed to seniors, or in some models we might try to maximize the number of deaths prevented. Then, it becomes a different performance measure or criteria.

Chagpar So clearly, cost effectiveness as I see it is really about making choices, very much like you said. And so, the choices between how you utilize a given set of resources needs to be taken into consideration. But some people may say, as opposed to other models of healthcare delivery, for example what some will call socialized medicine, other people will call universal healthcare, systems like what they have for example in Canada and the UK, where there is a single payer system, they would argue that perhaps cost effectiveness analyses are more important in those situations, but in the US, some people may say that the analyses that you do, go into guidelines which then effect what my insurance company will pay or not pay and yet I am paying a higher premium than if I was on a lower, less well-covered insurance plan. So, shouldn't I be able to, if I wanted to, pay for whatever test I want?

Yaesoubi Absolutely, I am not opposed to that, but again one of the benefits of these analyses is that it lets you make informed decisions. If you want to use this cancer screening at this point, there is this probability that you might have a false positive test and these are important things to think about, does the result of the test change your decision, and if your decision would change based on the result of the test, then it makes sense maybe to have the test, but otherwise, why would you have that test except that now you have a false positive that may not be very pleasant. So, again, it is all about making better decisions; whatever label we like to put on it, it is a matter of making informed decisions.

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Chagpar This is such a hot topic and we are going to pick it back up right after we take a short break for a medical minute. Please stay tuned to learn more information about healthcare and preventative cancer screenings with my guest, Dr. Reza Yaesoubi.

MedicalMinute Smoking can be a very strong habit that involves the potent drug nicotine, and there are many obstacles to face when quitting smoking, but smoking cessation is a very important lifestyle change, especially for patients undergoing cancer treatment. Quitting smoking has been shown to positively impact response to treatment and decrease the likelihood that patients will develop second malignancies. Smoking cessation programs are currently being offered at federally designated comprehensive cancer centers such as Yale Cancer Center and at Smilow Cancer Hospital at Yale-New Haven. The smoking cessation service at Smilow operates on the principles of the US Public Health Service Clinical Practice Guidelines. All treatment components are evidence based and therefore all patients are treated with FDA approved first-line medications and smoking cessation counseling. This has been a medical minute brought to you as a public service by Yale Cancer Center and Smilow Cancer Hospital at Yale-New Haven. For more information go to yalecancercenter.org. You are listening to WNPR, Connecticut's public media source for news and ideas.

Chagpar Welcome back to Yale Cancer Center Answers. This is Dr. Anees Chagpar, and I am joined tonight by my guest, Dr. Reza Yaesoubi. If you were with us prior to the break, you know that we were talking a lot about cost effectiveness. How do you get the most bang for your healthcare buck, and given the current healthcare economics and the current climate in this country, that is an important issue. I want to pick it up there, Reza, and talk about, what do you see as some of the major issues affecting healthcare delivery in the US?

Yaesoubi I am coming from a systems engineering field, so from a systems perspective, in my opinion maybe one of the major challenges in healthcare systems at the present time might be the misalignment of incentives. And by that, I

mean the way that we are rewarding health providers may not be necessarily the best way to motivate them to take actions that are also optimal or the best for the entire system. For example, back to our cancer screening example, if we are reimbursing our healthcare provider based on fee-for service, then that means that the more patients they see, the more money they earn, but we know that for many patients we need to spend a little bit more time to convince them, for example, or to provide them, with more information about the benefit of cancer screening or we might need to use this time to address their questions and concerns so that we improve their compliance to some of these guidelines. And if someone wants to take the time to invest in improving the health of that patient, they may not be necessarily rewarded by the way that we are reimbursing them. A timely example is vaccination. We know that there are some parents who are not comfortable with vaccines and doctors who have been

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reimbursed fee-for service might say, would you like to vaccinate your kid, and they say no and on to the next patient. But if we have different incentive systems, we can take this time, take this opportunity to address their concerns. It might take longer, maybe a 5-minute visit would now be half an hour. But that means that we help them to make more informed decisions that they are happy with and also is contributing to the overall performance of our healthcare system.

Chagpar Not that I disagree with you, but I am going to play the devil's advocate here. I am sure some physicians are sitting in the crowd saying, well that by definition means that you are assuming that I will favor my paycheck over my patients and that I will not take the time to talk to my patients and that I will do a colonoscopy every day on a patient simply because I get paid for each service and that does not necessarily ring true for many physicians. How would you respond to that?

Yaesoubi You are absolutely right. And the point is not that people or physicians do not want to do the right thing, it is just the system is not set up to reward or to motivate such actions or make it more comfortable for everyone; when they see a patient, they need to spend time, they can do that and get rewarded for making the right decision, it is not saying that they prefer a paycheck to the health of the patient, it is mainly making sure that they are also financially secured in terms of if they decide to spend both time and resources on, for example, improving their population compliance to cancer screening or to vaccinations. So maybe they can put additional effort to increase that compliance level.

Chagpar In terms of a redesigned model of physician incentive, how would you see that system working? There are a number of models out there that are being bantered about, but do you have some opinions on that?

Yaesoubi I know that there are some alternatives and I do not have any strong

opinion about which one is the best, but my point is that it might be a good idea and it is a good time to also invest in those options where maybe the traditional way that we are reimbursing our healthcare delivery systems is not the best option and maybe we can move toward maybe outcome adjusted or performance adjusted, where at least some portion of the payments can be contingent on the outcomes.

Chagpar And certainly that is where healthcare in this country is moving pending the upcoming election, but under the affordable care act as you know, physician incentives are going to be realigned really more towards the triple aim, so guaranteeing access, outcomes, especially patient-reported outcomes and population health, and thinking about how do we really use resources not just for individual patients but for the entire population. And so, coming to the forefront is really access, patient quality, safety and those kinds of initiatives. Some of the work that you mentioned at the top of the show in terms of your industrial engineering background, I think plays very much into how we can improve access, safety and quality. Can you tell us a little bit about some of your thoughts in terms of using industrial engineering concepts or management concepts to improve that?

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Yaesoubi Yes, and there is this myth that people believe that there is this iron triangle, that on one side you have cost, you have access and you have quality. So, if you want to reduce cost, you will hurt access and quality. Or if you want to improve your quality, you would have to increase cost and reduce access. But through systems thinking and systems engineering, you can move this triangle up and down through efficiency and that is what I think would be very important at this time, that when we say we need to expand the access to healthcare, it does not necessarily mean that we want to increase the cost, it means that through more efficient decision and through more efficient allocation, we can still contain cost by having better access and better quality. I hope that is something we will see in the near future by expanding the access, we are essentially allowing, we are reducing the number of people who are not insured, and data and evidence suggest that people who are not insured are more likely to visit emergency rooms and that is very costly and taxpayers or other people will end up paying for the emergency room visit because those people who are not insured will not be also able to pay for the emergency visit. So, if we can improve the access to healthcare, there is a high chance that we can prevent some of those severe complications and reduce the number of, for example, ER visits and that is cost reducing while at the same time expanding the access.

Chagpar A lot of people talk about that and logically it seems to have face validity. Have people actually done the mathematical models given the current data to suggest that if we did insure the entire population, how much would the emergency visits decline, what would be the cost savings and would that be able to pay for this improved access?

Yaesoubi I am not aware of any models that have studied that, no, not really.

Chagpar Because presumably the emergency room visits will never go down to 0. But the idea, as you say, is quite right that the emergency room visits are significantly more costly and treatment is significantly more costly than prevention, and so preventing disease will be more cost effective than treating it and that is really the whole cost effectiveness analysis behind vaccination and cancer prevention screening.

Yaesoubi Yeah exactly.

Chagpar Tell us a little bit about where you see the safety and quality piece fitting into this whole puzzle.

Yaesoubi About safety, I know that this has been a struggle in many healthcare systems. And you have heard that many hospitals or many health delivery systems are hiring in people from aerospace, for example, industry because they have been able to improve their safety measures significantly. So I think, in many other fields, there have been significant advancements in terms of safety of their products, of their work process, and we have this technology that we can take advantage of and benefit in the context of healthcare and I hope through this interdisciplinary work, we can bridge the gap between these fields for

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improving the quality of care.

Chagpar I mean certainly can you talk a little bit about the dynamic between cost of care and quality care. I mean is high quality-care more costly or is it in fact less costly than low-quality care?

Yaesoubi That is a wonderful question. Because that means in other words, that if you improve quality, it would add to the cost in many other areas, like production, if you produce a part that is not of good quality and you are going to use that part in the later stage of production, you also have to pay for that faulty part. So, same idea, if we do not provide high-quality care for patients, we might see an increased number of readmissions, hospital readmissions. So, again, these things, in my perspective, go hand in hand and they are not necessarily in contradiction with each other.

Chagpar So the whole idea of high-quality care, reducing complication rates, ultimately reduces cost. And so, I guess the whole concept in moving towards high-quality systems and using that system's thinking is to really be able in a replicable manner ensure that you have a high-quality system to provide high-quality care with lower complications so that you can actually reduce cost and with mass production, to go back to industrial engineering, or mass processes, reduce cost in that way. Is that kind of the concept?

Yaesoubi Yes, absolutely, and an important thing is to recognize that having efficient and good and high quality healthcare systems requires collective action.

So, if I do something now, someone else will be effected. Like a patient who visits a healthcare system, there are different elements, there are different participants in the healthcare system who will interact with the patient. So, we need to recognize that the actions that we take today will have some consequences and implications a week from now or two weeks from now, so that is another system perspective that we need to take into account in designing our healthcare systems.

Dr. Reza Yaesoubi is an Assistant Professor of Health Policy at Yale School of Public Health. We invite you to share your questions and comments, you can send them to canceranswers@yale.edu or you can leave a voicemail message at 888-234-4YCC, and as an additional resource archived programs are available in both audio and written form at yalecancercenter.org. I am Bruce Barber hoping you will join us again next Sunday evening at 6:00 for another edition of Yale Cancer Center Answers here on WNPR, Connecticut's Public Media Source for news and ideas.