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0:00:15.8 -> 0:00:44.4 Welcome to Yale Cancer Answers with doctors Anees Chagpar and Steven Gore. Yale Cancer Answers features the latest information on cancer care by welcoming oncologists and specialists who are on the forefront of the battle to fight cancer. This week, it is a conversation about the Tobacco 21 Laws with Dr. Abigail Friedman. Dr. Friedman is an Assistant Professor of Public Health and Health Policy at the Yale School of Public Health. Dr. Chagpar is a Professor of Surgery at the Yale School of Medicine.

0:00:44.4 -> 0:00:53.4 Abigail, let me start by asking the most relevant and perhaps basic question, what exactly are the tobacco 21 laws?

0:00:53.4 -> 0:01:19.2 It is a great place to start. Let's start with some terminology. So, every state in the US has a minimum legal sales age for tobacco products. It is typically 18. There are a few states with an age 19 limit and what this really means is that retailers cannot legally sell these products to individuals under that age. When a state or a local municipality raises their minimum legal sales age to 21, it is called the tobacco 21 law.

0:01:19.2 -> 0:01:23.2 Where are we in the state of Connecticut?

0:01:23.2 -> 0:01:35.6 Connecticut has adopted a law, they voted on it actually just recently, it has not gone into effect yet. It will go into effect in October.

0:01:35.6 -> 0:01:37.8 Tell us more about that law.

0:01:37.8 -> 0:02:04.6 In general, these laws vary drastically across states. They sound like they should all be the same, but some of them have enforcement restrictions that are well defined, so fines are maybe taking away a license or suspending the licenses of retailers, others do not. Some laws like California's give exemptions for military individuals who are over 18, others do not. Some laws have grandfathering restrictions.

0:02:04.6 -> 0:02:07.2 Tell us more about the Connecticut law.

0:02:07.2 -> 0:02:22.8 Connecticut will have a tobacco 21 law. Connecticut's law will go into effect on October 1st, I cannot tell you exactly how effective it will be, but I can talk to you a little bit about how effective the laws we have seen have been.

0:02:22.8 -> 0:02:44.5 Okay, let's start there. How effective have they been? It sounds like they all vary based on these restrictions, tell me a little bit more about what makes a more effective law than a less effective law because presumably we would hope that our legislators would have looked at said research and tried to make the most effective law possible.

0:02:44.5 -> 0:03:50.6 So, to give them some credit, there is not that much research. In 2015, the Institute of Medicine released a simulation study, which

basically means they have mathematical models and they make some assumptions and they put those into the models and it spits out an implication about what will happen to the smoking rate when the tobacco minimum legal sales age goes up. And that study said that we should expect a drastic reduction, about 12%, in the smoking rate of the generation that is exposed to that law and also over 200,000 premature deaths averted. So, that is a general estimate, but it is still a simulation. This year, my colleagues and I put out 2 papers that actually estimated the effect of these laws based on the data and it is based in one case on local laws only. So, laws that are at the substate level and then another on a mix of both local and state laws. And what we found in both cases is that tobacco 21 laws are expected to reduce smoking among 18-20 year olds.

0:03:50.6 -> 0:03:58 Is tobacco smoking among 18-20 year olds really a significant problem?

0:03:58 -> 0:05:12.3 Yes. The vast majority of smokers take up smoking before age 21 and a substantial chunk of them do it between 19 and 20. This is more of a problem than just that age range. You might think that, well we will not let them start before 21 and they will just start at 21 and it is not going to do anything at all. But if you talk to neuroscientists about this, what you will realize is that when you start smoking, while you are in the midst of adolescent brain development, it does not take as much nicotine to get you hooked and people who start smoking in their adolescence have a lot more trouble quitting. So, if we can get people who are going to experiment eventually to not do it until later, that alone could have a number of effects on the long run smoking rate in the population, and you have to remember smoking is responsible for about 1 in 5 adult deaths every year in the US. It is the leading cause of preventable mortality that has been for about half a century. It is treated as relatively blasé given the number of people who die from this. So, averting the habit is potentially one of the best ways to save lives.

0:05:12.3 -> 0:05:32.7 Let me play the devil's advocate a little bit here and push back. You know, you have a tobacco 21 law and you say, okay we are only going to sell cigarettes to people who are 21, that does not prevent me as an 18-year-old from getting my 21-year-old buddy to hand me a couple of cigarettes right?

0:05:32.7 -> 0:07:09.4 Depends on the law, but for the most part, correct. So, some laws also penalize possession, purchase or use if you are under that age. The thing is, there is not great evidence that those laws work better than penalizing retail and they are much harder to enforce. So, what you are doing when you put a possession restriction or a purchase or a use restriction in there is basically spreading enforcement, then it is not really great evidence that that is going to work. Now, here is the thing, yes, your 21-year-old buddy could buy 18-year-old you cigarettes and give them to you, but now, your 18-year-old classmate in a high school cannot do that if you are 16. So, one of the main arguments has actually been that this is to reduce the pathways to cigarette access among minors even though technically minors were not allowed to be sold them in the

first place. What is interesting about these studies that my colleagues and I have is we have shown that there is an effect in the 18-20 age group too. So, you can think about it this way - what is probably going on here is that there are some kids who are going to find a way to try cigarettes or whatever tobacco products they want regardless of what we do. And there are some kids that are not that interested regardless and there are some kids that as an economist we would say are on the margin - with the right incentives they will try it and without those incentives, they are not that interested. That is the group that you think that you are going to shift with a policy like this. These are marginal triers. But for a habit that has very, very high addictiveness particularly in this age range, shifting the marginal triers is a big deal.

0:07:09.4 -> 0:07:52.2 So, the other question that people could pose is when you restrict something, you say, thou shalt not buy cigarettes you 18, 19 or 20-year-old, sometimes that could make them feel like geez I really want to try it. Boy, when I turn 21, the first thing I am going to do is go out and buy cigarettes or I am going to want to try to get somebody to give me some cigarettes before then because you have made it now a scarce commodity, kind of increasing the allure of that. Has anybody looked at that and whether, you know, by making this something that is restricted, people might want it more?

0:07:52.2 -> 0:09:04 Well, keep in mind, they were already restricted, an 18-year-old has just been in age where they could not have them and there are plenty of alternative substances to use out there, we could talk about e-cigarettes a little bit here but the current evidence shows that conventional cigarettes are more risky than electronic cigarettes. So, if you are focusing on smoking that is conventional cigarette use, there is some thought that maybe you could shift kids from one product to at least the less risky ones. Now, just telling kids they cannot have something leads them to want to do it more. It probably depends on who the message is coming from, but the classic tobacco 21 law, remember it is not saying that you punish the youth, it is saying you punish the retailers. And the retailers have control over the flow of the product in a different way. So, if it is not a black market product, so we are not talking about an illegal drug, we are talking about a drug that for the most part comes through legal channels, at least at some point along the way. Then, penalizing the retailers, limiting their ability to profit is actually a much more effective approach than trying to find each kid who is taking a drag off a cigarette.

0:09:04 -> 0:09:37.8 Let's talk about retailers. First of all, how effective is the policy of actually holding retailers accountable for who they sell cigarettes to? I mean, you do not have necessarily a watch dog in every store making sure that they are carding everybody who is getting cigarettes. How is that enforced and how do we actually make sure that retailers are not selling to anyone below the age of 21 because if you cannot really enforce it, is it really effective?

0:09:37.8 -> 0:10:55.5 So, it depends on the state. Let's talk about the age 18 laws that we have had everywhere for a second. The FDA has authority under the 2009 tobacco control act to actually enforce and run these essentially raids,

they are not really raids to simulate having someone go and who looks under the age of 18 to purchase in order to catch these failures to comply with the law. They do not have the authority, that is the Food and Drug Administration does not have the authority for over age 17, so for 18 plus, which means that these tobacco 21 laws do need to designate some kind of enforcement right because they cannot rely on the Federal Government to do it. Some of the laws have done that, some policies designate and actually what is interesting is it varies widely. Some of them designate police, some of them designate Departments of Public Health, some of them do not designate anyone, and they have not been on the books long enough for us to really test the difference in the efficacy between those different kinds of policies. Remember the first tobacco 21 law at a state level was Hawaii in 2016. They have not been around that long and a lot of the adoption, yes 18 states have adopted these laws, but they have not all implemented them yet.

0:10:55.5 -> 0:11:08.7 So, we are still kind of waiting on that analysis, but intuitively, you are exactly right, if you cannot enforce it, what do you think is going to happen?

0:11:08.7 -> 0:11:54 Some states have minimum fines as much as 200-300 dollars for the first time a retailer is caught out of compliance. Some states have no minimum. Some states have fairly low maximums of about 100, some states have no maximum. There is a lot of variation here. In the long run, I think it is going to be people doing the kind of research I do, which is looking at small local and state policy variation and testing the differences in the effects between them, who are able to pinpoint the evidence base here, but it would be a lot easier for states in 10 years to up the size of the fine by changing that in their legislation, then to institute a new fine if they have not actually put it in there in the first place as an enforcement option.

0:11:54 -> 0:13:02.6 Have you looked at that, is there a particular fine that people should be instituting where it makes a difference because certainly if there is no minimum fine and the maximum fine is 100 dollars or whatever, and you are talking about large retailers, your stop-and-shops, your Walmarts, your big retailers who sell tobacco products, for them 100 bucks is nothing and there may be no enforcement mechanism because this is run at a state or local level, I mean it would seem like the whole rationale for going through a tobacco 21 law may simply be to appease the people in public health who want us to push the smoking age up rather than actually having meaningful effects. Tell us a little bit more about your research and whether these laws – A. Are effective and B. What are the aspects of the policy that make them more or less effective?

0:13:02.6 -> 0:13:26.5 Before I talk to you about the research, let me just add one thing, it is not just financial penalties, in some states, you can pull the license from the retailer entirely. So, if the threat is a 100 dollars here and 100 dollars there, sure a large company may not be fazed by that. If the threat is you will not be able to sell tobacco products at all, now that is a big question mark on someone's bottom line.

0:13:26.5 -> 0:13:57.4 And we are going to get into the whole aspect of what is really going to make these laws effective and more effective, and you mentioned that some of these laws have been adopted but not implemented, so how does that implementation actually correlate with outcomes in the long run? And we are going to discuss that right after we take a short break for a medical minute. Please stay tuned to learn more about tobacco 21 laws with my guest, Dr. Abigail Friedman.

0:13:57.4 -> 0:14:11.2 Medical Minute Support for Yale Cancer Answers comes from AstraZeneca, working to change how cancer is treated with personalized medicine. Learn more at astrazeneca-us.com.

0:14:11.2 -> 0:14:53.6 This is a medical minute about lung cancer. More than 85% of lung cancer diagnoses are related to smoking and quitting even after decades of use can significantly reduce your risk of developing lung cancer. For lung cancer patients, clinical trials are currently underway to test innovative new treatments. Advances are being made by utilizing targeted therapies and immunotherapies. The Battle-2 trial aims to learn if a drug or a combination of drugs based on personal biomarkers can help to control non-small cell lung cancer. More information is available at YaleCancerCenter.org. You are listening to Connecticut Public Radio.

0:14:53.6 -> 0:15:59.2 Welcome back to Yale Cancer Answers. This is Dr. Anees Chagpar and I am joined tonight by my guest Dr. Abigail Friedman. We were talking about tobacco 21 laws. So, for those who just joined us, Tobacco 21 Laws are laws that essentially up the minimum age at which you can purchase tobacco to 21. These laws have not been around for very long. Abigail was telling us just before the break that the first of these laws was adopted in Hawaii in 2016, only 3 short years ago and since that time, a number of states have adopted laws but may not have implemented them as yet. And so, the question really becomes how do you make these laws effective and there has been a real paucity of literature in that regard because these laws simply have not been around as long, but Abigail, you have apparently been doing some empirical studies, some estimations really trying to think about these laws and how we can make them more effective, is that right?

0:15:59.2 -> 0:17:27.5 Right. In July, 2 papers with colleagues that I lead authored came out. One of them is looking at local laws. So, we took advantage of the fact that yes, state-level laws have not been around that long, but actually towns and municipalities, counties started adopting these laws much earlier. The first one was in Needham, Massachusetts in 2005 and then there was a long gap. And starting around 2014 and 2015 - you see places like New York City putting in effect these laws. So, that is the early evidence we have to go on. So, one of the papers with my colleague, Rachel, actually my student who has now graduated and I can call a colleague, looks at local tobacco 21 laws and clusters of counties around urban areas. And basically what we wanted to know is, as tobacco 21 laws are adopted by more and more counties in the cluster you live in, does your likelihood of being a smoker go down if you are under age 21,

and do we see the same effect in a slightly older age group, in 23-25 years old who if we saw in effect there, we would say, it was not the tobacco 21, it has got to be something else. And what we found is that on average, the 18- to 20-year-olds who are exposed to tobacco 21 policies showed about a 10% drop in their likelihood of being smokers relative to those who are not exposed and there was no evidence that the 23-25 year-olds were showing the same trend.

0:17:27.5 -> 0:17:40.8 So, essentially this study showed that tobacco 21 laws are effective in that 18-20 year-old age group, which is the age group that you would expect to be affected?

0:17:40.8 -> 0:18:46.4 Right. Actually, it is really interesting on a few other levels. Remember these are local laws. So, you would say well, could not an 18-year-old just get in the car and drive a town over, what would happen? And that is an argument that has been made by many states in this country. So, there are now 16 states in the US that do not have a state-level tobacco 21 law and do not let counties and municipalities pass them at the county and municipality level. They have these policies that are called preemption policies. And the logic there is, this is a waste of resources to pass these laws locally, they might not work or some other logic at the state level, but if the policies work, then what that is effectively doing is saying that the state is going to keep your town from improving its population health. And what our study shows is that these laws at the local level are associated with reduced smoking in an age group that as you said earlier could just ask their older friends for a cigarette. So, if that is true, that means that the preemption laws are impeding public health for communities where the local community would actually support the law.

0:18:46.4 -> 0:18:47.7 Okay. Tell us about your other paper.

0:18:47.7 -> 0:20:51.5 The other paper is also looking at 18-20 year-olds, but it is different. In this case, we only looked at individuals who had used an e-cigarette or a cigarette before in their life. So, basically what we wanted to know was does this do anything to people who are actually likely to smoke, right? So, we looked at this group and we looked at people living in states and counties with and without tobacco 21 laws, and we saw the gap in the smoking rates between those 2 areas for 18- 20-year-olds larger than the gap for 21- to 22-year-olds who would not be bound by the law. And that answer is, yes the 18- to 20-year-olds were less likely to be smokers. But what is actually really interesting here is we ran a second check to look for something called the social multiplier effect. So, a social multiplier effect is basically when the behavior of your peers or your family or your friends alters or reinforces your response to something. And we know because there is a lot of literature that peer smoking has a big impact on whether or not you smoke, particularly if you are an adolescent. So, what we did is, we said okay if you are friends with someone, or excuse me, if your closest friends are people who use cigarettes or e-cigarettes before these laws went into effect, when you were say 16, are you more or less likely to respond to them by not smoking, and you are more likely to respond by not smoking. So, that is actually really counter intuitive right. You would think that people

whose friends smoke would be less likely to respond to the policy, but think of it this way: You have got a law that comes into effect that reduces your desire or ability to smoke, it is also reducing your friend's desire or ability to smoke and your friend affects you. So, you are basically getting hit by the law twice, you are getting hit by the law directly and you are getting hit by the law indirectly. And then, your behavior affects your friend. So, there is a feedback, which means that these laws have the potential to influence the individuals and specifically the kids who are most at risk of taking up this habit, which is really exciting.

0:20:51.5 -> 0:21:24.2 In this second study, you said that you were looking at people who had never smoked or used an e-cigarette, is that right? So, if you have an 18-year-old who was a smoker, turns 19 and is still a smoker, then the law happens, now you are a 19-year-old and you are faced with this law, are these people more likely to quit now that the law is in place and they cannot get their hands on a cigarette, is that what you are telling us?

0:21:24.2 -> 0:22:15.1 So, unfortunately we could not look at a sub-group of people who were regular smokers and whether they quit. We did not have enough people in the sample to do that. What I am telling you is that the likelihood that they became habitual smokers was lower if they were in that group. So, you have got lots of kids who will try a cigarette, maybe once or twice and not smoke again, try a cigarette once or twice and not become regular smokers until several years later or use cigarettes very intermittently for an extended period before they become daily smokers. So, that is the group we are talking about. These people who have experimented, who show a higher likelihood that they might eventually become habitual smokers, do they actually become habitual smokers and the answer is they are less likely to transition to habitual use if they are in an area with the tobacco 21 policy.

0:22:15.1 -> 0:22:37.7 And if they were habitual smokers, we do not really know whether they were more likely to stay habitual smokers or whether they too became less likely to be habitual smokers because now the number of cigarettes that they could get became less, so the habit had to kind of extend over a wider period of time.

0:22:37.7 -> 0:23:06.9 Yeah, we really do not know the answer to that question yet. And while I would say that I would like to know what the answer to that is; in the long run, we are going to have kids who are not just exposed to the said 18, they are exposed to it throughout their childhood, so we will not necessarily be able to run that experiment clearly because we will not be able to look at going from not exposed - to exposed anymore, we will only look at people who have been exposed their entire childhood and then become not exposed when they hit 21 if this ends up implemented more broadly.

0:23:06.9 -> 0:24:05.5 So, in your studies, I mean before the break, we were talking a little bit about nuances of various legislation. Some legislation that is enforceable, some legislation - the majority of which it sounds like is not enforceable at least on the local or state level, although some states have found

ways to have, you know, police or departments of public health, etc., try to identify which retailers may be selling to under-age people. We talked about different types of penalties for going against the law, whether it is a minor fine if anything versus having your whole license suspended, were you in any of these studies able to look at the penalties on the local or state level that made some of these more or less effective?

0:24:05.5 -> 0:25:08.5 So, let me just be clear, it is not the majority of them that are unenforceable and in fact, all of the laws are in theory enforceable and the vast majority of them do designate an enforcement agency and have some kind of fine. The variation is in the licensing restriction and the size of the fine and the type of enforcement agency. So, in some cases, I think in one state, it is actually the department of border patrol task forces that are responsible for this. In others, it is something that is a little bit less loaded like a department of public health. And we could not really look at how this varied in part because during the period we are talking about, there were only 3 or 4 states that had actually implemented laws, we were really relying heavily on the local policies, and local enforcement of course is going to look very different depending on whether it is at a county, a city, a town and such, so we were not able to test that. What we were able to show is that on average, the impact of these laws was to reduce smoking among 18-20 year olds, particularly among those who were likely to smoke.

0:25:08.5 -> 0:25:59.4 You know, I would also wonder in general how often individual retailers were found to be selling to an under-age person and whether a penalty was enforced because one would think that even if that happens once, it is kind of a deterrent to everyone else because then they know that there is this policy, it is kind of like the speed limit right? Not like anybody speeds on the highway, but you are less likely to speed when you see flashing lights a few meters down the line, magically everyone now follows the speed limits right? I wonder whether the same kind of thing applies in these tobacco enforcement laws?

0:25:59.4 -> 0:27:06.5 Well, this gets back to what I said earlier about the issue of the FDA not being able to enforce laws that effect non-minors for tobacco control. Prior to these tobacco 21 laws, most states had a tobacco minimum legal sales age of 18, so the retailers could not sell to anyone under 18, but 18, etc., could buy. And that could have been followed through by the FDA. There are enforcement options through the FDA for that. But when the law went up to 21, it is not clear whether the retailers will process that it has got to be a different kind of enforcement or that to the extent that this was federal officers trying to go and check whether or not people were complying that that was not going to be funded or followed through on for the 19-20 year olds. If the retailers have not processed that, they may be acting under their prior probabilities based on the under 18 enforcement. If they have processed, it is different, but on the other hand, it is entirely possible that some of these states are doing a better job.

0:27:06.5 -> 0:27:21.4 And so, this radio show is not intended to tell any retailer that they should not be vigilant about carding people because they are no longer worried about the FDA.

0:27:21.4 -> 0:27:57.7 No in fact they might need to be more worried if the state has given more power to a local organization to enforce it. It really depends, it is not clear, we do not have the evidence to tell you which yet, what I can say is that these laws or excuse me, these bills, that are still being considered; in fact there are 2 bills in the senate right now, 2 separate tobacco 21 bills look different and you got to read the fine print because this is the kind of stuff they vary on, has an enforcement agency been designated, are they funded, what are the fines, can they take licenses. Those kind of things are likely to matter even if we cannot test yet whether or how much they matter.

0:27:57.7 -> 0:29:01.1 You know, as a public health person, presumably you are very interested in getting these tobacco 21 laws implemented hopefully nationwide because your research has already shown that you can reduce tobacco use in a key age group in adolescents, but we all know that funds are limited and you know, I would imagine that many states are looking at this going, yeah so we can reduce tobacco smoking in 18-20 year olds by 10, 12% whatever it is, but that is going to cost us X amount of money to designate an enforcement agency to actually have them go out and do some enforcement, we may or may not collect any revenue from it depending on what these fines are like and how compliant people are, is it worth it?

0:29:01.1 -> 0:29:28.6 You know, if what you care about is revenue dollars at the end of the day and not saving kids lives that might be a valid question, but I actually think that states that are being kind of slowed down or being slowed down by a similar question which is what will this do to our tobacco tax revenues. So, I have actually seen documentation lobbying against state bills where people call into question the revenue effects, and I think the money is something that people are very concerned about, they got to think about the lives too.

0:29:28.6 -> -0:00:00.001 Dr. Abigail Friedman is an Assistant Professor of Public Health and Health Policy at Yale School of Public Health. If you have questions, the address is canceranswers@yale.edu and past editions of the program are available in audio and written form at YaleCancerCenter.org. We hope you will join us next week to learn more about the fight against cancer here on Connecticut Public Radio.