Per Ostmo: Now, it's my pleasure to introduce our presenters. First, we have Fred Ullrich. He is a program director for research activities in the Department of Health Management and Policy at the University of Iowa. He has over 35 years of experience as an analyst in clinical trials, health services, and health policy research. He has been with the RUPRI Center for Rural Health Policy Analysis since 1997.

Also joining us today is Dr. Keith Mueller. He is director of RUPRI and its Center for Rural Health Policy Analysis, and he is the chair of the RUPRI Health Panel. He has been a national leader in rural health research services, policy development and implementation since 1988. He has published more than 240 scholarly articles and policy papers and received awards recognizing his research contributions from NRHA, RUPRI, and the University of Nebraska. In 2016, he received the University of Iowa Regents Award for Faculty Excellence. Now, I'm going to hand things over to you, Fred. You can go ahead and take it away.

Fred Ullrich: Thank you, Per, and thanks to everybody who tuned in to today's presentation on rural pharmacy. Like virtually every health policy discussion, this isn't about a single time or event or a point in time. The current state of pharmacy's evolved over a long time, so let's start with just a little bit of background.

In December 2003, George W. Bush signed the Medicare Prescription Drug Improvement Modernization Act, otherwise known as the MMA. The MMA was the largest single change to the Medicare program since its founding 38 years earlier, and it had a number of provisions. It modified the compensation and business practices for insurers offering Part C plans, formerly known as Medicare Plus Choice, but now known as Medicare Advantage. It created a new health savings account statute. It provided additional funds to rural hospitals, and it had a bunch of other lesser known provisions. Of course, the MMA authorized Medicare coverage of outpatient prescription drugs, otherwise known as Medicare Part D.

In 2003, it was estimated that Medicare beneficiaries were spending an average of around $2,300 per year on prescription drugs. At the same time in that year, roughly two thirds of Medicare beneficiaries had some type of prescription drug coverage. They got it either through an employee plan as a retiree, they might have had Medicaid, they could have had a Medicare Plus Choice plan that offered a drug benefit. Then there were Medigap plans. They'd all been major sources of prescription drug coverage, but retiree coverage and Medigap coverage were limited to people that were of higher income, shall we say. Medicare Plus Choice had a very low participation rate, and in fact, all three of those had much lower participation rates in rural areas. So, the advent of Part D was a good thing, right?

That of course depends on how you define good thing. The debate around providing a prescription drug benefit had lasted for over 30 years, and so the final product contained a number of compromises. For example, the Part D legislation required most beneficiaries to choose between maintaining any

existing prescription drug coverage or joining a new Medicare Part D plan. If beneficiaries did not have what was referred to as credible coverage, their premium would be considerably higher when they did finally get around to enrolling in a Part D plan.

By March 2006, which was just three months after the initial offering, 41% of Medicare beneficiaries were already in some type of Medicare type D plan. This figure that I'm showing is from ASPE, the Assistant Secretary for Planning and Evaluation, and it shows how central to the Medicare program that Part D has become. In 2021, there were 48 million Medicare beneficiaries, that's around 75%, were enrolled in a Part D plan with approximately half of those enrolled in standalone Part D plans and the other half enrolled in Medicare Advantage plans with a drug benefit. At the same time, the Congressional Budget Office estimates that total spending on Part D plans will total around $111 billion this year, representing about 15% of total Medicare outlays.

But all that growth and coverage didn't come without a cost. Not long after implementation, there were significant rumblings about a number of aspects of the new program. Some of the RUPRI Center's earliest works on Part D focused on its impact on rural independent pharmacies where there were several recurring themes that we uncovered. The first of those was the burden on enrollment assistance, particularly dealing with formulary issues. I can use a personal anecdote to illustrate this.

At the time that it first rolled out, I was actually taking care of my mother's medical and health and financial life and when Part D rolled out, it was obvious we were going to have to join. Again, we didn't want to be subject to the penalty. So, I went to my local Walgreens because I was living in a larger metropolitan area and I'd moved all of my mother's drug acquisition to Walgreens, and I asked them to run me the report that they would produce for people that were anticipating joining Part D. Five minutes later, I had a 35 page document in my hand showing all of the plans that were available to her and what they would include in terms of her formulary.

For me, it was a relatively simple deal. Go to them, go to the big database, have them pull a quick report for me. Had I been living in Tiny Town, Nebraska, however, and gone to Bob's Pretty Good Pharmacy, he probably didn't have that database, and so it would've been a real significant burden for him to go through all of those available plans and figure out which ones would apply to the drugs my mother was taking.

Another complaint was the reimbursement levels. There was complexity dealing with multiple plans and the timeliness of payments were an issue, and Part D plans are consistently identified as one of the lowest payers for drugs. The gross margin for prescription for Medicare Part D was lower than the gross margin needed to stay in business, so lots of people were complaining about the payment levels. To say the least, things weren't particularly rosy. You might assume that a lot of these were startup problems that would soon fade, but we

started hearing more stories of pharmacies closing and after finding some usable data, we discovered that the problems were much more enduring than we might have thought.

In 2008, we produced the first of our closure briefs. Using data from the National Council for Prescription Drug Programs, we confirmed that there'd been a significant decline in the number of independently owned pharmacies in rural areas around the United States. We reported a net loss of around 500 rural independently owned pharmacies between May 2006, which was six months after the implementation of part D and April of 2008. There was a brief leveling off in 2009, but the decline has slowly continued ever since, and I will show that more later. You might have noticed that much of our focus so far in the talk has been on independent pharmacies. That's because independent pharmacies, that is those that aren't affiliated with a chain or a franchise, are more likely to be the sole source of pharmaceutical services in rural and other areas facing poor access to care. For example, approximately 44% of non-core counties have only independent pharmacies serving them.

At first blush, one might have thought that more people with a pharmaceutical benefit should mean more customers and more money rolling into the pharmacy, right? We can't say for certain what has caused the decline of rural independent pharmacies, but the findings from two different surveys that we conducted between 2007 and 2016 all highlighted a key problem. In both surveys, we found that rural independent pharmacies, identified their ability to generate net revenue from the sale of prescription medications as their biggest challenge.

In the old days, most prescriptions were cash transactions, so a pharmacy could charge whatever the market would bear. And again, this was particularly true in rural areas where Medigap retiree insurance and Medicare Plus Choice rates of participation were particularly low. But now with the advent of Part D, most prescriptions were covered by insurance, meaning that the pharmacist is no longer completely free to set his or own price points.

In fact, the pharmacy remuneration payment process is pretty complicated. This infographic came from a Wall Street Journal article and it provides a relatively simple description of the pharmaceutical and money process. Drugs go from the manufacturer to the wholesaler. From there, they go to the pharmacy and from there, they go to the consumer. Money basically goes from the consumer to the pharmacy, either in the form of a co-pay or an outright payment and to the insurer or the employer. But after that, things get a little bit complicated.

Insurers, of course, they want to have the best deal possible, so they hire something called a Pharmacy Benefit Manager or PBM to handle negotiations with the drug companies. PBMs also negotiate with pharmacists using the combined weight of all of their clients to leverage cheaper retail prices. Often, independent pharmacists have no footing from which to negotiate, and so they're offered a take it or leave it kind of deal. Chains like CVS or Walgreens

have a lot of leverage and can conduct actual price negotiations of PBMs. The small town independent pharmacy like Bob's Pretty Good Pharmacy in Tiny Town, Nebraska doesn't have a lot of say in these price negotiations. For some context, there are 66 PBM companies with the three largest Express Scripts, CVS, Caremark, and Optum RX, which is the pharmacy service segment of United Health, control approximately 89% of the market. But wait, it gets uglier.

When Part D was created, the federal rules included something called Direct and Indirect Renumeration fees or DIR fees. The DIR was intended to increase cross transparency and basically states that any benefit like discounts or chargebacks or rebates or cash discounts that would bring the price down from the contracted price of Medicare, needs to be reported to CMS. For example, a manufacturer might provide a rebate to a PBM if they can assure that a company's drug becomes the preferred drug for patients covered by the PBM. Pharmacies might be expected to provide a rebate to the PBM in order to participate in the preferred network. This is also known as pay-to-play. Where this gets real ugly is when the PBM assesses fees based on the performance of the pharmacy. These fees are based on a PBM's quality measures, which generally are unknown, unpredictable, and inconsistent and outside of a pharmacy's control.

What's worse is that when a pharmacy failed to meet performance standards, the PBMs could retroactively take money back from the pharmacy. Pharmacies referred to this as a clawback and it could happen weeks or months after pharmacy transactions. Retroactive DIR fees resulted in pharmacies realizing only long after the prescription was filled that they did not recoup their entire cost. Between 2010 and 2020, CMS reported that retroactive DIR fees increased by a staggering 107,000%.

Fortunately, there have been two recent developments to bring some restraint to the use of DIR fees. First in 2020, the US Supreme Court in a decision titled Rutledge v. PCMA upheld an Arkansas law, which required PBMs to reimburse pharmacies at a price equal to or higher than what the pharmacy paid to buy the drug. This actually triggered a wave of state laws clamping down on PBMs and also spurred scrutiny from federal lawmakers concerned about antitrust legislation. In fact, in May of this year, CMS issued a final rule that put an end to PBMs retroactively applying their fees. It requires that fees be reflected in the negotiated price that the patient pays at the pharmacy counter. The rule included all price concessions beginning on January 1st, 2024. Note that means that pharmacies are going to have to endure clawbacks for yet one whole year. CMS has not yet addressed the issue of PBMs reimbursing pharmacies less than what it costs to acquire the drug. But as I stated, many states have adopted such legislation.

It's important to remember that PBMs were developed in the late 1960s. They didn't come along with Part D. They predate the advent of Part D by a long time. But what Part D did was it elevated the impact of PBMs by providing significant and abrupt growth in the number of people using insurers to obtain their

prescription drugs. It wasn't just the growth in the number of people, it was the growth in the number of old people like Keith and me that can be pretty heavy prescription drug users.

To revisit and to update somewhat, this is the picture of rural independently owned pharmacies in 2018. There's that sharp decline that we saw starting around 2007, but then there's been continued diminution since then. Again, we can't say for certain that the reimbursement issues are the sole cost for this decline, we've not gone out to survey every closed pharmacy to say, why did you close up shop? It's just beyond what we're able to do, quite frankly. Some of you might remember also that 2007 was the time of the great recession, and I'm sure that contributed to some decisions to close pharmacies. But before we attribute pharmacy closure entirely to the great recession, consider the following slide from a policy brief that we published this year.

This year, we looked at change rates in the number of pharmacies based on ownership and geography. While our brief again reported that drop in independent pharmacies we saw in 2007, we saw no evidence of such a decline in the large change chain pharmacies that we show here on this graphic. Obviously, the big chains had more financial resources to get through the great recession and small independents were probably more likely sensitive to recessionary pressures. But the growth of chain pharmacies through this period, even in non-core areas, indicates that factors other than the great recession were leading to independent pharmacy closure. So, why do we really care about local pharmacy? After all, most prescription drugs are available through mail order now, right?

If it was simply a matter of dispensing prescriptions, the local pharmacy might not be so important. But the community pharmacist actually wears a lot of hats. They monitor dispensing patterns to avoid substance abuse. They screen for interactions between medications. They provide patient education and counseling. They also enhance preventive care through health screens, management of noncommunicable diseases and immunizations. They're frequently the first line of healthcare, especially for disadvantaged populations. Think about it for a minute. If you have some unresolved health issue that you're concerned about, it's much easier to stop by the local pharmacy and see what the pharmacist suggests or thinks might be the problem than to try and set up a meeting with a physician or try and get across town or even into town for an urgent care visit. Pharmacies are also frequently the last source of healthcare and information in small communities. We know of a number of places where the physicians or the hospitals are pulled up root, and the last surviving healthcare provider in town is the pharmacy.

At no time was the importance of the local pharmacist more obvious than late in 2020 when the White House announced that the focus for public distribution of the initial Covid-19 vaccines would be through "a public private partnership with 21 national pharmacies, partners and networks of independent pharmacies designed to expand equitable access to vaccines." What the White House at that

time apparently didn't recognize is the fact that there is a significant number of places in the United States that didn't have a pharmacy eligible for that partnership.

Using Census data and the pharmacy data that we've been analyzing for 20 years, we found that there were nearly 1.5 million people living 300 counties that either didn't have a pharmacy or didn't have a pharmacy that was eligible for participation in the White House partnership. There were another 2.7 million people living in another 300 counties that had only a single pharmacy. If you're the only pharmacy in the county, it's unlikely you're going to have a lot of spare capacity lying around to provide vaccinations for everybody in your county.

Taking the concept of pharmacy presence one more step, we recently produced a brief on pharmacy deserts in the United States. We found that there are 138 counties with no retail pharmacy at all. Not surprisingly, most of those are non-core counties with pretty small populations. However, we also found that there were 22 metropolitan counties with no retail pharmacy. They were all outlying counties owing their metropolitan status to workforce commuting behavior. When we looked at the population counties with no pharmacy, we found a real mixed bag of characteristics across geographies. But when we focused on non-core counties, again the smaller counties, small counties with no pharmacy, we found that people living there were more likely to be non-white. They were more likely to be Hispanic. They were more likely to be unemployed, and they were more likely to be uninsured.

You might recall a little while ago, I brought up the concept of mail order pharmacy or mail order prescription fulfillment. Mail order pharmacies are legal. It's a good thing. They're convenient, also a good thing. And under some circumstances, they can offer substantial savings or some savings over traditional pharmacies. They offer fairly efficiently for prescriptions treating chronic conditions or other illnesses that don't require timely delivery and are profitable given consistently high demand. They work really well for people that need their blood pressure medication month after month, the same drug over and over and over again and fairly common drugs.

But this isn't the case when it comes to urgent medications. I need an antibiotic now. I need some other sort of medication now. It's not the case where it comes to urgent medications that need to be filled and dispensed promptly, and they don't work well for drugs that aren't necessarily what they have in stock. What most mail order pharmacies do is they provide these common chronic condition medications. If you have something that's fairly esoteric or out of the usual, there's a good chance that the mail order pharmacy, even if it can provide it in a timely fashion, doesn't actually happen in stock. Likely more important, mail order pharmacies or services fail to replace the other fundamental functions provided by pharmacists beyond filling prescriptions such as health screenings, patient education, counseling, vaccinations, and medication management, all those things we've talked about previously.

Pursuant to this, we produced another brief earlier this year looking at pharmacy services used by Medicare beneficiaries living in rural counties where there is no retail pharmacy. We found that slightly less than 20% of those beneficiaries have used mail order prescription services during the year. This rate was only slightly higher than for beneficiaries living in counties with a retail pharmacy. As a cautionary note, however, these same beneficiaries average fewer prescriptions filled and fewer pharmacy encounters than beneficiaries of the local pharmacy. We don't know if this is the fact that there is no local pharmacy, means that people aren't filling prescriptions, aren't getting prescriptions, aren't making trips to the pharmacy, we're not entirely sure.

Telepharmacy constitutes one possible solution to retail pharmacy deserts, given its potential to improve access in needy areas. A pharmacist can remotely oversee a pharmacy technician and provide patient consultation through real-time video conferencing. We've actually done a couple of briefs looking at state regulation telepharmacy, and despite the potential benefits of telepharmacy, only around half of US states have legislation authorizing telepharmacy. Most of the time, that authorization comes with a laundry list of requirements. For example, there's technician training obviously, but supervising ratios as well. That is how many technicians or locations can a central pharmacist actually oversee? There are physical location requirements including how much space the remote site must have, what kind of facility it must be, does it have to have a brick and mortar? Does it have to have a lock on a door? How are the drugs stored, et cetera.

Then there are also requirements for distances from other pharmacy. A lot of states have restrictions that a telepharmacy location cannot open within a set distance of an existing pharmacy. Now, there are also restrictions on the location of the consulting pharmacist. How far away or how close must the consulting pharmacist be and can they practice interstate? Similar issues to what we've seen in lots of workforce issues about interstate licensing.

Even before the public health emergency, healthcare workforce issues were a hot topic everywhere. Of course, pharmacy services are facing those same issues. But in rural areas, workforce issues are particularly acute. As I've explained, rural towns often have only one pharmacy serving the community, often dependent on a single pharmacist owner to maintain the business. Because pharmacy workforce issues and shortages are more common in rural areas, recruiting and replacing those pharmacists has been difficult. This frequently means that when the pharmacist leaves practice, the pharmacy closes. In fact, several of the pharmacy surveyed in interview projects that we've conducted over the years, found that this so-called succession issue is a major concern.

But it's not all bad news for small pharmacies. I showed this slide a little while ago when I was talking about the impact of the great recession, but what may be more interesting is the decline in chain pharmacies starting around 2019. We're not really sure if there was anything particularly magical about 2019, but

in a really relatively span of time, a couple of very different things happened. First, a couple of large pharmacy chains, including CVS, announced large scale store closures. But there aren't many CVS or any CVS stores in small rural locations.

The issue in many rural locations, i.e. the red and green lights on this chart, was that several large retailers closed their operations entirely. For example, there was a regional retail chain named ShopCo, kind of like a smaller regional Walmart, that in 2019 announced it was closing department stores in 360 locations. These were largely rural locations. ShopCo had a metropolitan presence, but it was largely known in the Midwest for serving rural, smaller communities. Many of those stores that they closed also contained a pharmacy. Thus, the pharmacy closure had little or nothing to do with the pharmacy's performance itself.

But the chain closures actually created some opportunities in some rural areas. There was a December 2021 Kaiser Health news article that highlighted new independent pharmacies opening in rural communities where large pharmacy change once existed. Pharmacists in several rural towns in Iowa, Montana, and Idaho filled the voids left in these small towns as large store chains of pharmacies and pharmacy retail chains closed their stores. In fact, at least one pharmacist indicated that he had sold his practice to ShopCo and closed up his shop and then went to work for Shopco. Then when ShopCo left, he reopened his shop and took up business again.

Finally, the last year or so, we've seen a lot of legislative activity. In 2021, over 200 bills were introduced in 43 states addressing practice expansion and payment issues for pharmacists. The legislation includes bills allowing pharmacists to prescribe medications, order diagnostic tests, and receive payments for pharmacist-provided services beyond filling prescriptions. The legislation wasn't limited to the states, however. Note that the recently signed Inflation Reduction Act includes a number of provisions that will alter part of the Part D landscape, but virtually all of those provisions are directed at lowering prescription drug costs for Medicare consumers. The impact of those provisions on pharmacies isn't known at this time.

Much of the pharmacy services provided under Covid-19 were conducted under the framework of the public health emergency, and there's been concern that a lot of public services or a lot of services or service access to pharmacies will be lost when the PHE ends. Earlier this year, a bill was introduced in Congress to establish a federal reimbursement mechanism for pharmacist services under Medicare Part B. The purpose is to ensure patients continue to have access to essential pandemic and pandemic-related care services provided by pharmacists, including services to keep communities safe from future public health crises.

Recognition of the important role played by pharmacists is extending beyond the work of policy nerds like us. A 2020 report from the Association of American

Medical Colleges or AAMC, showed that 63.4% of surveyed primary care providers expect pharmacists to have a greater role in delivering primary care services. They also found that 77% of surveyed patients agree or strongly agree that the pharmacist is an essential member of the care team. Discussions of special consideration or reimbursement mechanisms for pharmacies in rural or underserved areas frequently raise the example of the critical access hospital.

The concept of Critical Access Pharmacy or CAP has been bandied around for some time. But in 2019, the state of Illinois actually adopted the concept. A CAP is defined as an Illinois-based brick and mortar pharmacy whose owners have an ownership or controlling interest in fewer than 10 pharmacies and is located in a county with fewer than 50,000 residents, or is located in an area designated as a medically underserved area or MUA by the Health Resources and Services Administration, or HRSA. Brick and mortar pharmacy is defined as a pharmacy that's open to the public, much as we see here, where participants present at the pharmacy to fill prescriptions and the majority of the pharmacy's business is not mail order-based.

Qualifying pharmacies receive quarterly payments from the state based on the number of prescriptions they fill that are reimbursed by the state's Medicaid program. In its first year of operation, the state dispersed around $9.7 million in payments to hundreds of critical access pharmacies in Illinois. The funding for the program is limited and its scope is pretty narrow. But of course, the pharmacies that have benefited from the program have claimed that it's a real lifeline. At this time, it's unknown if other states or the federal government are seriously entertaining similar programs.

That pretty much sums up what we know or where we are right now. This is actually an old slide that I did several years ago. We've done at least six more pharmacy-oriented policy briefs since I did this slide. But what I say on here still holds true. There's plenty of room for more work. Obviously, we will continue to monitor the landscape and look for opportunities to expand and apply our knowledge of rural pharmacy, and of course, we welcome suggestions and input from our colleagues at FRHP, other health research centers, and anybody else that's tuned in today. We'd be happy to try and answer any questions that you have at this time. Thank you.

Per Ostmo: Thanks, Fred. The first question, if you can go back towards the beginning of the slideshow, there was a list of services that pharmacies offer outside of just dispensing medication. There we go. Now, as this relates to telepharmacy, telepharmacies still need a brick and mortar store, but they're operated by a pharmacy tech instead of a pharmacist. If that's a situation a resident is in where their brick and mortar store is operated by a pharmacy tech, which of these services are going to be affected then? What is that resident going to be missing out?

Fred Ullrich: Obviously, they will be missing out on a face-to-face consultation directly with the pharmacist. That's still possible via the telehealth setup. When we talk

about telepharmacy, it's the same as anything with telehealth, I can use that term and people immediately develop this idea of what telepharmacy is. There are at least a dozen different models of how this actually works and how it's actually done. Based on our experience here in Iowa, it means that you go see the pharmacy tech, you present your prescription, the pharmacy tech counts out the pills, does the packaging and so on, and then invite you to step over to basically what amounts to a phone booth. Then in the phone booth, you have this two-way video conversation with an honest to God pharmacist.

Now in that case, virtually none of this is missed except for possibly the vaccinations that I don't think is actually even on this list. I can talk to my pharmacist, I can say, this is what this drug's doing, here are the other drugs that I'm doing. In theory, the pharmacy tech has already gone through the interactions. They've looked at the other things that you're getting. I can talk to the pharmacist about those concerns. A pharmacy tech is not a pharmacist, but I can ask them questions about medications and they can, within the scope of their license or certification, respond to those. I can step in the phone booth, I can talk to the pharmacist about other issues that I might have. As far as I've got a thing here, should I see a doctor about that? I'm not sure that that falls within the rubric of telepharmacy, but an awful lot of other conversations can't happen in that regard.

Per Ostmo: Theoretically, a telepharmacy brick and mortar store would require a pharmacist to be on-call essentially during business hours?

Fred Ullrich: That's right. Because I'm not sure if it's all state laws, but most state laws require before any prescription is handed out, you'd be offered an honest to God, face-to-face via live or video consultation with a pharmacist before you can actually receive the medication. I know that's the case in Iowa. I'm pretty sure it's the case most everywhere. There has to be that consultation.

Per Ostmo: Okay, thank you.

Keith Mueller: Or at least the offer.

Fred Ullrich: I'm sorry?

Keith Mueller: Or at least the offer.

Fred Ullrich: At least the offer, yes.

Keith Mueller: Just like when we go to Walgreens and they say, do you want to talk to a pharmacist? And 90% of the time, if we're just picking up a chronic med, we say no. But they have to be able to have the pharmacist there to answer any questions.

Per Ostmo: Okay, perfect. We do have a manageable sized audience, so if anyone in the audience would like to raise their hand and ask a question, I can ask you to unmute. We're going to pause for a moment and allow anyone who wants to raise their hand to do so. Okay. Joy, I'm going to unmute you or ask you to unmute, I should say.

Joy Dahlen: Hi, I have a question for you guys. Do you have any advice on creating pharmacy services in these rural areas? Maybe a certain process that has been done that you guys know of or steps that pharmacies can take in rural areas to help increase and close those deserts?

Fred Ullrich: Well, if we did, I think we'd be making a lot of money.

Keith Mueller: Yeah, we have nothing specific. It falls under the same general consideration as a lot of other providers in terms of building and maintaining a sufficient client base that someone would be interested in investing in if you had to put in telehealth capability or if you had to invest in hiring the technician. It does come back to how you interact with the local client base in the business terminology in the community.

Fred Ullrich: We also know that there are lots of places where pharmacies have closed or where there may possibly never have been a pharmacy, but there's a significant enough population that a local pharmacy in the area will take up delivery service. That's something we don't talk about because quite frankly, the data really does not exist. But we know from some of the survey work that we've done that there are a number of pharmacies that will provide delivery services to smaller communities that don't have a pharmacy service available locally. But as far as setting something up or establishing something, we don't have any of it.

Joy Dahlen: Okay. Thank you.

Fred Ullrich: Thank you.

Per Ostmo: All right. Conner Armstrong, go ahead and unmute yourself.

Conner Armstron...: Hello. I was just wondering, for the telepharmacies and the restrictions with location to other pharmacies, is it within a certain number of miles from another pharmacy or a population of an urban area, or how's that worked? Then also, can techs be licensed? I suppose it maybe depends on the state, but to give vaccines and stuff at those remote outposts?

Fred Ullrich: For the most part, you almost answered your own question right there. Remember, pharmacy licensure, pharmacy rules, regulations, what have you, are all handled at the state level. Clearly there's some federal regulations that come down on top of that like schedule three drugs and so on. But for the most part, pharmacies are guided by their own state pharmacy boards and

regulations. As I said, we know that roughly half of the states in the United States have some sort of rule or law governing how pharmacies operate, and they are all different. In some states, the tech can only be so far away. The tech can only be 60 miles away from the supervising pharmacist. I'm not sure what the justification is, but that's one of the rules. In other places, they can be within 200 miles. There are staffing ratios, as I said, so a single pharmacist can only oversee one or two techs. The regulations are all over the board.

As to what techs can do, again, that's a state-based rule about what they will allow anybody to do and there are different certification programs in place for techs. A state can define what a certified or qualified technician has gotten for training and or experience, and those rules are also all over the board. Does that answer your question, Conner?

Conner Armstron...: Yeah, I think so. Thank you.

Per Ostmo: All right. We're going to leave it open for questions for a few minutes longer. Fred, can you go to the second to last slide?

Fred Ullrich: Sure. Oh yeah, getting there.

Per Ostmo: One more. One more.

Fred Ullrich: One more.

Per Ostmo: There we go. All right. Before we go, we're going to leave a little bit more time for questions, but I'd like to remind everyone that you can sign up for Gateway's research alerts. These are some examples here of what you would be notified on. We send emails whenever new rural health research is published by the Rural Health Research Centers. So if you subscribe, you'll get information whenever new research on pharmacies is published by RUPRI. We also send alerts about upcoming webinars, and our subscribers will be notified later this week when the recording, slide deck, and transcript for this webinar becomes available.

All right, and we have a question. Tyler Hemsley, go ahead and unmute yourself please.

Tyler Hemsley: Thank you. Quick question regarding the research and potential partnerships or funding opportunities that are available. I work with a small non-profit organization here in Idaho, and you mentioned some of the innovation within the context of pharmacy that Idaho rural pharmacies had kind of risen to fill some of those population gaps. Happy to hear about that and we've been part of some of that work. Are you all interested or as you pursue further research in collaboration with some of these rural states and rural areas and projects that have been undertaken so far?

Keith Mueller: Always interested in collaboration. That's how we operate. That's how we do our work. Our history in the pharmacy world is one in which we've collaborated a lot over the years with the University of North Carolina, especially in the early years of our investigation. We've collaborated with some of the pharmacy associations and some of the state pharmacy offices, so it's sort of in our DNA to collaborate.

Fred Ullrich: If you'd like to send us some contact information, we'll keep you on our list, Tyler. We have a number of initiatives that we're pondering for future research, and as Keith indicated, we're always looking for rural friends.

Tyler Hemsley: All right. Happy to hear that. I'll shoot you an email here shortly. Thank you.

Fred Ullrich: Very good. Thank you, sir.