

Dr. Tamar Rodney

Hi, I'm Tamar Rodney, and you're listening to On the Pulse, a podcast from the Johns Hopkins School of Nursing. On this podcast, we take a deep dive into the experiences of frontline providers and researchers. We explore their insights and invaluable stories of how health care works in today's world. A new research study published in the Journal of the American Medical Association shows that changing neighborhoods can lead to drastic improvements in children's asthma.

According to the study, which was conducted in Baltimore, the odds of having an asthma attack were reduced by 54% after families moved to better resourced neighborhoods. So this improvement matches what you would expect to see with taking an asthma medication. And two of the study investigators are here with us today, Dr. Craig Pollack, the Katey Ayres Endowed Professor at the Johns Hopkins School of Nursing and in the Department of Health Policy and Management of the Johns Hopkins Bloomberg School of Public Health.

He's also a practicing primary care internal medicine physician whose research focuses on social determinants of health with an emphasis on housing policies. And Dr. Elizabeth Matsui, associate chair for research in the Department of Population Health at Dell Medical School. She's also professor of population health and pediatrics, the director of the Center for Health and Environment, Education and Research, and associate director of the Health Transformation Research Institute.

Welcome to you both.

Dr. Elizabeth Matsui

Thanks for having us.

Dr. Craig Pollack

Thank you.

Dr. Tamar Rodney

So let's jump right into this. Dr. Pollack. Could you start by walking us through the basics of the studies? Tell us more about what were you researching?

Dr. Craig Pollack

Sure, I'd be glad to. So this is a study that helps us try to understand how neighborhoods matter for children with asthma. So we know there are tremendous inequities in asthma attacks across different groups of children in the United States. And so often when we're thinking about these inequities, we're thinking about them from the individual child and household perspective.

And here we're interested in looking more broadly at the neighborhood context. And to do this, we collaborated with an organization called the Baltimore Regional Housing Partnership. This organization was founded as a result of a fair housing lawsuit that argued that HUD was creating racial segregation in its approaches to housing in Baltimore. And so as part of the remedy for this, they created housing vouchers that could be used in non-poor areas and help families overcome barriers to moving.

They helped children move to neighborhoods that are characterized by lower rates of poverty, by better schools. And then the housing vouchers helps defray the costs of housing. And from 2016 to 2020, we

recruited families where children had asthma, and we asked them to enroll in a study that studied what happens to their children's asthma as the families move.

And to do this, we went to the families homes every six months. We collected really detailed survey information. We went and vacuumed their home to look for different allergens that were in the environment. We sampled the air in their homes and we looked at their breathing function to really try to understand what's happening. And in the interim, we also did questionnaires or surveys every three months.

So it was a really detailed assessment to try to understand what's happening and what's changing as they move and what's happening to their asthma symptoms.

Dr. Tamar Rodney

That's excellent. So from a bad problem we're trying to solve is and as you said, extremely detailed down to the vacuum. So tell us, what were the main results you found from the study?

Dr. Craig Pollack

So the results were really striking. So before moving, for every hundred children, there were approximately 88 severe asthma attacks per year. After moving, this was reduced to approximately 40 asthma attacks per year for every 100 children. This is over a 50% reduction in asthma attacks. We also saw reductions in asthma symptoms that were really striking. And when we looked at it, we tried to understand to what extent is this due to changing environmental triggers like mouse and cockroach allergens.

And we saw that those decreased with moving, but they weren't the key factors. Instead, it was really about changes in stress that families were experiencing related to their neighborhood environment. That seemed to be a key factor in these changes in asthma attacks and asthma symptoms.

Dr. Tamar Rodney

I'm so happy you said that, because I think reading the title of this study, you think it's just an environment with very little focus on the stress that the parents might be experiencing as well. And I'm going to shift a little bit to bring Dr. Matsui into the conversation. So, Dr. Matsui, as the leading expert on the effects of environmental exposures on asthma, what were your thoughts on these results of this research?

Dr. Elizabeth Matsui

The number one take home point is that it's less about who you are and more about where you live. And where you live broadly construed is really about environment, but in a broad sense. So I think that's a really, really important take home point and in my mind is the major take home point. So when we start to drill down, to try to understand which aspects of the environment mattered the most.

One of the key findings Craig already mentioned, which was that stress contributed a great deal to explaining the improvements in asthma that we saw when kids moved. But there still remained a large percentage of the benefit of moving on asthma that was not explained, that we couldn't sort of attribute any particular environmental exposure to. So it means there's a lot of other things going on too that we didn't measure.

So then shifting to things like indoor allergens, what I would caution people about is that I don't think this shows that the indoor allergens don't matter. We know they matter from a decade or more of work in this area. It's that the study wasn't set up or designed specifically to answer that question. And so you may ask why that is.

Well, kids who are susceptible to mouse allergen exposure are allergic or have a positive allergy test to a mouse allergen exposure. This population, only a small percentage of them were allergic to mice and only a small percentage of them were allergic to cockroaches. And then in addition to that, kids who are allergic to one thing are often allergic to multiple things.

And we saw some allergens actually increase when kids moved. So dust mite allergens, so an allergen that's found in dust. And so at the end of the day, what we could say was that for this population overall, it didn't seem like any particular allergen mattered. But that is largely because of kind of the study design, that it wasn't intended to examine things that way.

If we were to go back in time or we're able to enroll a population of kids with significant asthma who were just allergic to mice and cockroaches and not also to dust mites, we would probably get a different result at least based on what we know about those allergens. So again, a major caution that this doesn't mean that those allergens don't matter in any particular individual child or certain populations of kids.

What it does mean is that stress matters and your overall sort of neighborhood matters.

Dr. Tamar Rodney

Excellent. And thank you for repeating that line, because I wouldn't want them to ignore the things that are right in front of us that we can't change. But what would you say tells us about asthma, its specific causes, and how we could better treat asthma, knowing what we know from this study?

Dr. Elizabeth Matsui

Well, I think I would conceptualize treatment in a very broad way and think about it not solely to be kind of pharmacologic or medication management and think about it as being an approach to managing the environmental contributors. And here we know now that neighborhood is a major contributor, so we don't have systems embedded in health care systems to connect families with housing mobility programs.

I know Craig is actively doing work in that area, but there are things that clinicians, clinics and health care systems can do, which is there's a lot of interest for screening for social determinants of health. So if they can understand the housing situation, the neighborhood situation of the child, and if they're able to connect them to social support services, housing support services, then understanding that supporting families like that who are living in highly disadvantaged neighborhoods, to moving to better resourced neighborhoods if those families desire is expected to reap marked benefits in terms of their asthma.

Just knowing that I think should be a major motivator to really build on the current movement to screen for social determinants of health.

Dr. Tamar Rodney

Excellent. And you mentioned briefly about this some of the stressors that were changed. What were some of the types of stressors that were reduced in this move from one environment to the next?

Dr. Craig Pollack

So I think there is a whole range of stressors that were reduced with moving and some of the key ones were around neighborhood safety. So a larger number of caregivers said that they felt comfortable and safe walking around their neighborhood during the day, as well as comfortable and safe walking around their neighborhood at night. So that safety in the neighborhood was really a key factor in our findings.

Dr. Tamar Rodney

Thank you. And Dr. Matsui mentioned briefly about some of the changes we could make. And if I could ask you about implications for strategic changes of policies, particularly around housing and disparities. What would you think would be the implications of this in terms of how we push for policy changes?

Dr. Craig Pollack

Sure. I think it's it's a great question. And one of the things that I was thinking about as Elizabeth was talking before about health systems and what they're doing. We've been really excited to see the Baltimore Regional Housing Partnership, our collaborator on this effort, start a new program that is trying to offer clinicians the opportunity to recruit patients that they think would benefit from mobility services, the chance to receive their housing mobility services, the chance to help them move to more resourced neighborhoods with the support of their organization.

So that's a pilot that's currently ongoing, and I think we're really excited to see that kind of collaboration that exists between housing organizations as well as clinicians and health systems. I think more broadly, there's just the sense that as we think about the cost of housing policies, thinking about what are the kind of broad range of benefits that might accrue, and so calculating that potential health benefits from these types of programs, from these types of voucher programs and mobility services, I think are really important.

And I think they also have implications for how we think about neighborhoods and trying to promote neighborhood safety, neighborhood cohesion, and many of the factors that were important in our study.

Dr. Tamar Rodney

And if we could just go a little bit deeper for families who are hearing these results, but they can't move. What else could they do to mitigate some of this asthma symptoms or to lessen the stressors that we have identified?

Dr. Elizabeth Matsui

So I think there are potentially a variety of things. So I'll start with things that they can do that are separate from housing or addressing their housing situation and then talk about addressing their housing situation. So it's important to understand what their child is allergic to. So the vast majority of kids with asthma have allergic asthma and getting allergy testing to common environmental allergens can help pinpoint allergens that may be triggering their asthma that are in their home, especially if they understand what exposures there are in the home.

And there are ways to address some of those exposures in the home. In terms of the housing piece of things, understanding whether they have assisted housing or qualify for housing assistance of some kind, and hopefully being able to connect through sort of social services through their pediatrician so that those social services can help connect them with housing services is another way that they can be proactive beyond just trying to address exposures in their home environment.

And there are other common, you know, indoor exposures that I would be remiss not to bring up, which include indoor pollutants like second hand smoke exposures indoors. So those things are things they could address now while they have their eligibility for housing assistance evaluated by social services. And and I think the part about neighborhood stressors is a little bit tricky because certainly seeking social support, seeking mental health support services can be important to try to mitigate whatever neighborhood stressors there are, but there is much less research about whether those might be effective as an intervention and to deal with the stressful environment in which you live.

Dr. Craig Pollack

I would also add that I think there is ongoing research about what sort of neighborhood change is most effective at having health impacts. So what are the ways that communities can come together to plan and build green spaces as one example that might be associated with lowering crime in a community and hence have important ramifications, for example on children's asthma.

So I think that type of research about what place based strategies work is a really important complement to the work that we're doing here around mobility and helping families overcome barriers to moving.

Dr. Tamar Rodney

Your mention of greenspaces sounds fascinating, and I think it goes right into my next question about what are the next steps for this line of research or what would you like to do next?

Dr. Elizabeth Matsui

I guess I can go first and talk about the interest that we have in looking at the long term benefits on asthma. And in particular, we're interested in understanding whether asthma goes into remission when kids move. We are also interested in what happens to their lung function growth. And so what do I mean by that? So as kids grow, their lungs get bigger, they are able to blow out more air and the rate at which their lungs grow seems to potentially be increasing after they move.

So that moving might be and we want to find this out linked with faster, better growth of lung function. And so why does this matter? It matters because kids or young adults reach their peak lung function in early adulthood and then after that, and this is bad news for all of us on the podcast, we lose lung function every year at a certain predictable rate.

So the higher your peak lung function when you reach early adulthood is, the better off you are. You're less likely to get chronic obstructive pulmonary disease and your lung function is actually a predictor of mortality. So if moving increases the rate at which your lung function grows, then we would expect that those kids, when they reach early adulthood, will have a higher lung function and will be at lower risk for adult lung disease.

And so that's one particular question of great interest. And in fact, we have ongoing funding to examine the long term effects of moving on asthma. And this matters because we don't have any medications that alter the natural history of asthma. So this would really, I think, be a game changer not only in that it would put an exclamation point on the importance of where people live, but it would be a game changer in that it means that we can alter sort of the natural history of asthma and improve outcomes.

And we don't have that as part of what we can use in terms of asthma management.

Dr. Craig Pollack

To add on to what Elizabeth was saying, in addition to studying these children long term as they move and we see what happens to them and see what happens their lung function, which is so critical. I think another really key gap in the literature is how do we think about bringing some of these tools to practice? How does health systems and physicians, when we're working with patients better screen for social determinants and better connect them to resources and making sure that the resources are out there for them?

I think one of the real concerns about screening people for problems with their housing is that there's maybe not enough that we can do. We sometimes feel powerless as clinicians to address it, despite some of the important measures that Elizabeth mentioned. And so I think that these kind of implementation questions and these types of building a coalition to kind of make sure that there are resources there for the families that we're working with are really critical next steps.

Dr. Tamar Rodney

What I'm hearing you highlight here is actually the timing is critical because it means that kids could have a better quality of life. Would that be a fair statement?

Dr. Elizabeth Matsui

I think the idea is, yes, intervening during a vulnerable time when lung maturation or development is still ongoing means that there's much greater potential for longer term benefits.

Dr. Tamar Rodney

And then to Dr. Pollack, I mean, I am getting the impact of this from this side, because I hear what you're saying and I see the things that we could do, but how do we get policymakers to really understand the implications of studies like this?

Dr. Craig Pollack

That's a great question, and I hope that through podcasts like this and through other ways of trying to make sure that people hear about this research and learn more about what's going on, that will help make the case that policymakers should consider this type of health benefit as they're as they're making policy decisions.

Dr. Tamar Rodney

Thank you. And we get to use information like this to advocate as clinicians and care providers for our patients as well. But this has been fascinating. Thank you both for joining us today. This research is fascinating, to say the least, and certainly shines a light on how several factors like housing, income,

safety and neighborhoods play a role in our health and possibly even a bigger role than we probably would attribute to those before. This study, I would say has relevance and not just neighborhoods, but those across the country. And we hope it can inform important policies to better improve asthma in the future. So Craig and Elizabeth, thank you very much.

Dr. Elizabeth Matsui

Thanks for having us.

Dr. Craig Pollack

I appreciate it.

Dr. Tamar Rodney

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