Episode 260- Dr. Alan Delmerico: Geospatial Analysis: "Where" Matters

[00:00:08] Welcome to inSocialWork, the podcast series of the University at Buffalo School of Social Work at www.inSocialWork.org. We're glad you could join us today. The purpose of inSocialWork is to engage practitioners and researchers in lifelong learning and to promote research to practice and practice to research. We educate. We connect. We care. We're inSocialWork.

[00:00:37] Hi from Buffalo! This inSocialWork episode is about the importance of space. One of the particular joys of our space in Western New York is the annual return of spring migratory birds in late March. Our old friends like Eastern Bluebirds, Robins, Song Sparrows, Red-Winged Blackbirds, the spectacular Great Blue Heron, Meadowlarks and Purple Finches are all coming back to brighten our annual transition from winter to spring. Oh and to make baby birds. I'm Peter Sobota. Don't be intimidated by this episode's title. If you've ever used Google Maps you're on your way to getting your head around understanding the impact of geographical and economic influences on issues important to helping professionals, researchers and those their efforts have served. In this episode our guestDr. Alan Delmerico, a health geographer and economist, describes how he is gathering data and using it to help researchers and practitioners account for the interaction between people and their geospatial contexts, social workers think person in environment, and how these interactions shape outcomes and help inform interventions that assist in promoting improved health care promotion, accessibility and prevention efforts. Dr. Delmerico discusses what geospatial technologies are and how they work. How they assist in quantifying relationships and help analyze and understand the impact of person and context on interactions perceptions and the behavior of clients and service recipients. Alan Delmerico Ph.D. is a community health behavior scientist at the Institute for Community Health Promotion Center for Health and Social Research at SUNY Buffalo State. Dr. Delmerico was interviewed in February of 2019 by our own Robert Keefe Ph.D. associate professor here at the UB School of Social Work.

[00:02:26] Well Al, thanks so much for joining us. I know you've been doing a lot of work in GIS for quite a number of years now. Can you give our listeners an idea of what your current research is and what you're focusing on in that research?

[00:02:38] Sure. So I'm a health geographer by training with additional training in economics and geographers are very naturally, look at the world through spatial relationships between people and their environments or between people and other people within those environments as a way to see the world. And as an additional dimension that helps us to understand the nature of the phenomenon that we observe, sometimes about nature but also about people and as a human social oriented geographer I have a real vested interest in trying to elucidate the nature of some of those relationships and how they impact health phenomena, especially around health behaviors. So my interest in that and in health in particular are very broad, but I've spent a lot of my career over the last 15 years focused on mental health and substance use. And my workplace, the Institute for Community Health Promotion at Buffalo State, we have an extensive history of doing applied and translational research around those two areas and in particular around the prevention of alcohol and substance use and mental health promotion. And my sort of niche within that that I've developed over time, I'm a much more of a quantitative type of scientist as opposed to one who's more interested in qualitative types of topics, not that they're not both equally important. But my goal really in a lot of the work that I've done is in working with human service providers is trying to make data more accessible and more easily used and more supportive for decision making. So that's taken a variety of different forms depending on the project. But oftentimes it falls into the serving up of archival needs assessment types of data or analytical types of reports looking for gaps in services and where you might have misalignment of where programs are delivering services to populations and where you may have unmet need. And that's really important I think from a systems perspective to be able to understand how to do that work better and to potentially find

additional resources to do more of that work in a time when we have relatively scarce resources to support our prevention and treatment systems in substance use and mental health. I also have a lot of interest in looking at bigger picture population level outcomes and how to serve up that information to guide systems level evaluation. Are we getting to the types of outcomes that we would expect given the inputs that we put in to the system for delivering a certain number of units of prevention or treatment? Do we see that the commensurate impacts that we expect that maybe the literature might tell us we should expect from delivering model programs or evidence based programs, do we actually see that in our community when we look at the system as a whole. So I have a real interest in a broad set of research but it tends to fall into a couple of those types of categories. I'll mention one more thing before we move on, which is National Institute of Health funded project with some collaborators at the UB Research Institute on Addictions, where we're looking longitudinally at the exposures in childhood and on violence and victimization among the respondents who are still in late adolescence. And our contribution really as part of this research team is to try to better understand the nature of adolescent activity space and how exposures within that activity space can help to understand what the exogenous influences are on some of those outcomes related to violence and victimization, weapon caring behavior, alcohol and substance use behaviors, beyond just the individual level factors that these responses have been measured longitudinally. And I think that interaction effect that is so critically important that it's not just about the person but it's about the person nested within their environment and our ability to understand that relationship is really important.

[00:06:28] And as social workers we're very concerned and our focus has always been heavily on the fit of the person within the person's environment. And I think your points are very relevant to our social work listeners, particularly your point about service needs as being important to social work practitioners. Can you give us an idea of what geospatial technologies are, how they work and so forth?

[00:06:49] Sure. At the core of it the geospatial technologies tend to be centered around what are known as geographic information systems and these are computer human interfaces that we use for analyzing and visualizing spatial data. And they have come a long way over the probably 50 years worth of development and they're very accessible and most people probably don't even realize that they're using what are effectively GIS based systems every day on their smartphones. If you pull up Google Maps and you identify a location and you plot directions from your current location, driving directions or walking directions or potentially using public transportation. You're effectively using a geographic information system to access spatial data and to pose queries to that system and get results that then might inform your decision making, be it about travel or about assets that might be in your environment, might be assets like human service agencies or pharmacies or might be a hot new restaurant that you want to go to that's in your neighborhood. But all of those types of information, they're spatial information. We have information about point locations and space from street addresses and we can plot those relative to one another within a coordinates space and a GIS is really the fundamental system that allows us to do that. Now the ones that geographers tend to use that are on desktop computer systems are products like ArcGIS which is manufactured by a developer called ESRI. But there's lots of open source versions as well. The challenge is there tends to be a pretty steep learning curve for using those types of systems meaningfully and there's always a danger in a sort of blackbox style approach to any of that work where if you are naive to the nature of what you're doing within a computer system you may be able to work through a graphical user interface wizard to do a geospatial process, but you may not have an understanding of what you're doing and whether your results mean anything. And that's why I think it's critically important for geographers to try and engage with other fields and try to add that expertise to research teams so that information can be more readily used and used appropriately for research and practice. So beyond the GIS based system many of our listeners have probably heard of what's known as GPS, or Global Positioning System. Colloquially we might call the systems we use in the car to get

around Tom Toms or Garments and things like that is GPS devices. And really most smart phones, probably all smartphones have GPS based functionality. And as technology has advanced over the last few years we've seen a huge explosion in GPS enabled wearables that go beyond just a smartphone in the pocket, but to watches and other devices that allow us to do really complex point based data collection about a person's activity space as well as activity within that activity space since many of these devices are oriented around physical activity and things of that nature. But the access to those technologies allow us as researchers and potentially in practice as well a tremendous opportunity to understand people's interactions with their environment, their perceptions of that environment and in turn their effects on their behaviors and perceptions as well. In addition to the health outcomes we might be ultimately concerned about. So spatial data are really all around us, whether non geographers really I think recognise that but they're really voluminous and they are so imbedded within the way in which people live their lives now through the widespread use of smartphones and other technologies, so geographers like myself I think have a real vested interest in trying to make those technologies and the beat in which they support more integrated with research and practice outside of the traditional fields where they're used in geography and urban planning and epidemiology that access to those types of data have tremendous value that is underutilized at the moment within fields like social work. So I have a lot of interest in trying to find ways to make those data more accessible and to serve them up in ways that are really meaningful for people involved in research and practice.

[00:10:55] You know I really appreciate the point given how data are available around us and available for use. Can you speak about how these technologies and lines of inquiry, how they line up for social work and research and practice?

[00:11:09] Sure. So many mental health related phenomena, for example we know that there are population level drivers antecedents, whatever you might want to call them, that tend to suggest population level outcomes. We know a lot about individuals as well. We know within the individuals the indigenous factors that tend to result in different types of mental health related outcomes. What we need to do better and what we need to understand better and what geospatial technologies can help us to understand better are the interactions between individuals and their context and some of the nuances to those relationships that we don't presently understand well that could help to not only drive what our research agenda is and what we know about how those interactions shape health outcomes but also to hopefully indicate ways in which we might produce interventions that reduce some of the effects of those health outcomes. And this can be for mental health, it could be for other physical health related conditions that are ever present in the minds of health professionals. It could be obesity, it could be the opioid epidemic or it could be postpartum depression. We need to have a deeper understanding of what those relationships between individuals and their environment and how those interactions can contribute to the outcomes that we see and that we want to ideally prevent or make better that understanding those relationships is something that I think geospatial technologies can do really well but we need to build systems that we can integrate those data meaningfully into our research as well as into practice and those areas are still in progress, I would say. And so that's an area that I'm particularly interested in. It's really I think ripe for development and that broader research agenda that looks at socioecological factors, many social determinants of health have substantial impacts at the population level on individuals and their health outcomes. What we need to understand better are ways in which we can have interventions both at an individual and population level that can ameliorate some of the challenges because of those social ecological factors and that's really ripe for investigation.

[00:13:13] I think you're absolutely right. And in the area as you mentioned the postpartum depression we've only begun to start looking at a lot of the social determinants that effect the depression of particular groups of mothers, particularly mothers of color who have been largely under-researched in that area of postpartum depression. Can you describe how this understanding

might help us resolve some of the challenges that social workers face in general?

[00:13:36] Sure. Social workers really know community and they know people but oftentimes they don't systematically integrate those two factors using especially quantitative data. And for a variety of reasons. That's not a knock on the field it's a challenge that is not specific to social work either. But it's an opportunity I think for growth and ways to enhance the impact of service delivery and for research agendas to really understand the nature of those multilevel interactions between people in the environments in which they're embedded. But there's a lot of ways in which these types of technologies and the integration of geospatial data for decision support might be really useful for social work as a field. Just thinking about the effectiveness of service delivery based on retention. You may have people who drop out of service very systematically or very heterogeneously in space. So knowing where those issues in retention are could have dramatic impacts on the way in which we perceive the effectiveness of service delivery. And those things may vary with specific social determinants of health. One of the factors that oftentimes is mentioned is the real driver of people's ability to go about doing things that they may have been asked to do by clinicians or social workers is access to reliable transportation. That can be critically important for somebody who's struggling to get their life on track. And if let's say you had previously had a car that was reliable and that car is now not working and you're relying on public transportation, rides from friends or family, your world is very different. Not only do you have all of the other things that might be stressors or challenges for you, but you're also now facing doubling down on that because you have no reliable transportation and every bus ride you have to take takes two to three times as long as if you had been driving your vehicle there. If you've got to take your kids to daycare or to grandma's house or somewhere else you're now challenged by dragging them along on the bus to go to those locations or go to an appointment. The factors that are really outside of the control of the individual can be I think critically important to understand systematically using data that might be available. Linking people to transportation systems and to better understand how in taking the retention example, if you have the population of people who have been involved in service delivery who now have dropped out of that service delivery and they're located in a place that has limited transportation access in order to access services, that would be really useful for the system to know and potentially respond to. And these are the types of things that are hard to respond to with only anecdotal or qualitative information. I think that's a good starting point to understand the nature of the challenges. But to build I think a case for what the response should be in a system level, oftentimes we need to include more quantitative data as well. And that's a piece that I think the integration of geospatial technologies and information can really help with.

[00:16:23] And I think a lot of, thinking as a social worker myself, I know that a lot of people do drop out of services because of very concrete reasons. It is an issue of transportation or child care or something that may actually not be directly or specifically related to the reasons why they're entering services or seeking service. Often when we as social workers are trying to document reasons why clients are dropping out, and of course so much of the funding that we get in agencies depends on client retention. Many of the reasons why they're dropping out are not particularly clinical in nature at all. So it's not that the kind of noncompliant, it's that a client may have just a logistics issue in accessing the service and maintaining their access to service. I think these are all very key point for our listeners to be able to grapple with and be able to document as they apply for ongoing funding for services and whatnot.

[00:17:11] Absolutely.

[00:17:11] Can you give us an idea of what's the next step for you? What's the next step in your research?

[00:17:16] Well so you certainly know, we're part of a research team that's looking at applying for

some National Institutes of Health funding to do some trials looking at app based interactions with groups of moms around postpartum depression. So that's certainly one area of research that you and I are both very interested in. From my perspective on that work it's largely around how to use app based interaction to potentially gather geospatial data about the individuals and the environments in which they're exposed to and to be able to survey them about what their perceptions of those environments are and the way in which those environmental exposures may influence their perceptions, behaviors and outcomes. So that's I think critical interest for me as a scientist but I've also been involved in sort of on the other side, not in a community based type of interaction, but in more traditional clinical based care delivery working with some collaborators at the University of Rochester Medical Center in trying to better understand in a similar way with thinking about serving up data meaningfully to social workers in how we better engage within a clinical care environment. How do we better engage physicians and their support staff as well as patients directly in understanding the nature of their environment, how to access geospatial information about assets that may be available to them in their community as well as understanding from an administrative and research perspective what are the influences that are currently not investigated or understood well enough about the context that may influence the patterns we see in patient behavior and outcomes. And so I think that's critically important to impact the efficiency of clinical care delivery, get better outcomes, improve the patient satisfaction with their interactions with the health care system. So instead of getting a pamphlet when you leave your doctor's office after a five minute interaction with your clinician that you have a more robust interaction that is specific to you and the environment in which you're embedded that helps clinicians understand the nature of your unique embeddedness within a physical environment and the assets and challenges you may face because of that environment but also helps to potentially empower you as the patient as a person to be able to better access what may be available to you within your environment with the help of clinical care staff. And I think that that's an area that's ripe for investigation and development and something that helps geographers have a lot to potentially contribute to. Last thing I'll mention about that is that my office, the Institute for Community Health Promotion at Buffalo State were very heavily involved in translational research, especially around collective impact approaches and really trying to help systems better respond and better collaborate to respond to the challenges that we are collectively faced with. We do a lot of work with prevention and treatment systems here in Erie County and again serving up data and analyses that help to support decision making for the system. But that's something that it's not a unique need to that field and it's one that I think has a much broader potential application in many other areas. Getting people to, and by people I mean individuals that are health professionals broadly defined that do human service related types of activities. Getting them to be engaged and to talk to one another regularly to try to develop of opportunities and to really work towards common goals. And I think that there's a lot of opportunity to do that and to have it improve the way in which service delivery happens as well as the types of outcomes that we get working together.

[00:20:48] And these are all very key and important issues for social workers to consider. The collaboration with other professionals who can help us as social workers to understand the communities in which our service recipients live, the types of variables that impact the client's ability to access services and what we as social workers can do collaboratively with other professionals such as geographers to remedy those problems. I think these are all very key and important issues for social workers to consider. So Dr. Alan Delmerico, thank you very much for joining us today on our podcast. We greatly appreciate your time and expertise in our discussion. Thank you.

[00:21:26] Thank you. It's been my pleasure.

[00:21:27] You've been listening to Dr. Alan Delmerico discuss geospatial analysis on inSocialWork.

[00:21:42] Hi I'm Nancy Smyth, Professor and Dean of the University at Buffalo School of Social Work. Thanks for listening to our podcast. We look forward to your continued support of the series. For more information about who we are as a school, our history, our online and on the ground degree and continuing education programs, we invite you to visit our Web site at www.socialwork.buffalo.edu. And while you're there check out our technology and social work resource center. You'll find that under the Community Resources menu.