# Systems change evaluation and network analysis

May 2, 2022

2:00pm-3:00pm ET

Webinar Transcript

Russell Cole

Thanks so much, Lexi. So, thanks everyone for coming. It's been a few months since our last innovation and impact grantee OTA webinar. We're really excited today to talk with everyone about systems change evaluation and network analysis.

I want to spend a moment on housekeeping. Everyone should have been muted on entry. We're going to keep lines muted today to minimize any issues with feedback and echoes. If you have any questions, please submit it into the chat at the bottom of the WebEx screen. We do have team members who are watching that. We're also going to have a Q&A session at the end. We're going to try to address any tech issues that come up immediately via the chat, and we'll save those substantive questions and that content until the end. So, Lexi has already recorded today's meeting so you can share it with any of your team members who can't attend. So let's begin, and I'll turn to this agenda right now.

This is a rough outline of how we're going to spend our time together today. I'll do five minutes or so doing introductions and setting the stage for today's talk, and then my colleague, Drew Koleros, is going to present some information on measuring changing complex systems. That will establish a framework for this topic and some key terms that are going to guide our presentation. He's also going to facilitate a MURAL activity, as a way for you all to think about possibilities of measuring aspects of systems of change evaluation as part of your IIN project work.

After that activity, I'll do a brief introduction on social network analysis, some approaches commonly used to measure and describe the aspects of communication that's necessary for many system change evaluation projects. I'll also try to bring this together as it relates to the IIN grant program before we open it up for Q&A at the end. Next slide, drew.

So let's meet today's speakers. So Drew Koleros is a senior researcher here at Mathematica, with over 15 years of experience in designing and delivering mixed methods evaluations and program monitoring, evaluation and learning for social and economic development projects. He brings particular experience and expertise in using theory-based approaches that integrate complex concepts and systems thinking into programming

evaluation design processes. Folks, please mute yourselves if you've come off mute already.

I'm Russell Cole, the PI on the email TA contract for Mathematica, and I'm a TA liaison for a handful of IIN grantees. I've done systems change evaluation and network analysis on a handful of projects here at Mathematica, most recently working on a project focused on integrating child welfare and substance use treatment system as part of the Children Bureau's ongoing Regional Partnership Grant Program. Next slide, Drew.

So here is what we're hoping to do today: We only have an hour, and I'm mindful of the time, so the goal here is really to do introduction and illustration. We're not expecting to fully describe how to do a perfect systems change evaluation. What we are hopeful that this presentation is going to plant some seeds for some ideas and spur some interest, and that you'll get some access to additional resources for some more detail.

We're going to first introduce systems change and system change evaluation today. We'll try to establish some common language to guide our presentation, so we'll often use different terms. We're going to spend the majority of our time talking about ways to think about and frame systems change evaluation activities. Having a framework is really important to structure a defensible measurement analysis and recording plan for systems change work. And I know that some of the grantees here have asked for a bit of introduction to social network analysis, and we're going to do that here too.

The goal really is to try to give enough information to enable everyone to see how they can disseminate a story about systems change processes, one that's driven by data that you collected on key systems change constructs of interest. We're also going to try to talk about how systems change evaluation can help you showcase the merit of your IIN grant approach to describe its promise and limitations appropriately. Next slide, please.

So, quick note on expectations, the main goal of your grant is to create and refine one or more promising innovative interventions through the collaborative work that you're doing with a multidisciplinary network of partners. That being said, we know that some of the grantees see that the work that they're doing across their network of partners as important, as transformational and that this is a story that they want to tell. So that's why we thought that doing this introduction to systems thinking and systems change evaluation processes might be useful to help folks think about documenting change process and results for dissemination of the system.

Just to be really clear, formally reporting the work that we're talking about today is not a grant requirement. You certainly are expected to develop

innovative interventions and showcase problems; that's a requirement. And you may be doing pieces of what we're talking about today as part of your learning agenda and your dissemination plan, so it's great that there's parts of this work that are already in hand. What we're trying to do today here is to help you to see a way to package this information into more formal and more structured and fill in gaps, if that's what you'd like to do. So that's really all from me for right now. I'm going to turn things over to Drew for the next half or so kind of get into this stuff.

Drew Koleros

Great. Thanks so much, Russ. I'm really looking forward to being here with all of you. When Russ said we're doing an hour webinar on systems change evaluation, this is quite a broad church. Let's focus in on how we can do this in the best way for this set of grantees, because there's a lot of different perspectives in systems change, which we'll get into a little bit today.

So, before we get stuck into these methods and principles for measuring change in complex systems, I thought we would just start off by saying why are we all here talking about systems change. And for me, and a lot of other folks, there's this kind of nagging question that brought us to the world of systems change. It's reflecting on why is it that the depth and breadth of support that we've providing to social sectors, including the public health sector, is in many cases, not leading to the optimal health outcomes for all. So, you have complex problems like high rates of teen pregnancy among some populations, even though some sub-populations even though the trend in general is moving right in the right direction, or the fact that STIs are suddenly persisting in our best efforts in these.

So, for folks who are trying to grapple a little bit with why are we finding these complex problems just stuck here, systems change is starting to attract the attention of dealing with the root causes of problems. And I have this little picture here of an aquarium, and I like to use this whenever I'm talk about systems change, because I think it's a nice example.

Imagine that I have this aquarium here, and one day I find that all of the fish in the aquarium have died. I want to address that problem. Well, my solution to that problem wouldn't be just to buy more fish and put them back in the tank, because, presumably, whatever killed the first round of fish is going to kill the next round of fish as well, so I have to start thinking about, well, what is causing these fish to die? Maybe it's the temperature of the water. Maybe it's the acidity or the PH in the water. Maybe there's some sort of other bacteria or something else that's allowing these fish to die, because if I just keep buying more fish, the same problem is going to continue to persist. And that's sort of an inherent example that we all can kind of relate to, and although systems change is kind of the big fad and all the mode right now, that's really what we're talking about, is

understanding the root causes that are holding a problem in place. So it provides us with a lens for understanding some of these complex problems, not just in the aquarium but some of the other problems we were just talking about. But it also gives us an approach to start to address these problems and then a frame for evaluating them.

But before I start getting into solving complex problems within these systems, let's step back and define a few terms. And I want to recognize that you've received a lot of resources already on systems thinking and systems change effort, and I want to acknowledge all of the great work you've had so far an what you'll be building on in the future. For the purpose of today's webinar on measuring some of these changes, we're going to provide a few definitions that make sense for this particular exercise. And one of the biggest challenges with systems changes, because systems are everywhere, different folks define systems in different ways. So, whether you're a computer scientist like Tom Holland, a physicist like Barabasi, a fellow evaluator like Emily Gates, or a social scientist like Donella meadows, based on your lens and frame of the world, you define system in different ways.

I'm going to list up here one definition Donella, which is really one of the big systems thinking gurus in the field and advance a lot of our thinking about systems change within the social sector. She defines a system as an interconnected set of elements that is coherently organized in a way that achieves something, some function or purpose. And that systems' function or purpose is achieved through the actions and interactions of the different systems elements. So, the respiratory system is comprised of many different elements that act and interact and work together to allow you to breathe. The different instruments in an orchestra are the different elements that work together to produce beautiful music. And the components of a supply chain come together to create a function or purpose of delivering a good and service to a consumer or, from the business perspective, allowing that business to grow and gain its market share.

So, across all of these different systems, we're seeing the multiple different components come together to achieve something bigger, some broader function or purpose. And across all these different types of systems, well start to see some common characteristics of systems. So all these systems exist in an environment or a context. They all have boundaries, but that's a little bit more complex than it seems, and we're going to get into that in just a minute. And they're made up of multiple elements of different pipes, and these different pipes or elements could be tangible or they could be intangible. We could be talking about people, institutions, policies. We could also be thinking about attitude and beliefs and mindsets. So it's the understanding of these different elements within the system, and the

actions and interactions of all of these different elements together, so the cause and effect relationship between all of these different elements within the system.

So, in that context, systems change is the process that we use to alter a system, by shifting its function and purpose from a current state to a future more desirable state through purposeful intervention. And as you can see on this graphic, that's oftentimes where you intervene or enter into a system isn't the same place where you measure change or the outcome in that system, because of both actions and interactions, those relationships between all of those different elements within those boundaries. That seems pretty simple.

But when you start to really get into those factors, that's when we start to really understand how do intervene within systems, because how we intervene to change a system is dependent on many interrelated factors. The first one is where we draw the boundaries on that system. So if you've ever heard of the butterfly effect, where a butterfly flaps its wings in South America and causes a tornado in Eastern Europe, that's a definition of what we're talk about on systems and boundaries. In general, there are no boundaries on the system. Boundaries are a construct that we need to put on them. They're necessary but they're arbitrary. So all systems are interconnected and that's how that butterfly effect analogy comes aboard. But in order to really understand how we're going to intervene and where we're going to intervene, we do need to set a boundary on that system. So, boundaries is one.

The second is thinking about the system dynamics, how the system is organized, and, specifically, how well we understand the cause and effect relationships between those system elements or those system components, those actions and interactions of all of those different elements. And how well we understand those system dynamics also has a bearing on how we might intervene, and then the interplay between how well we understand those system dynamics, as well as where we set the boundaries on the system really define how we might intervene.

People with different perspectives will define the system differently, and they'll have different perspectives on how we might intervene in that system as well. So, I'm going to walk you through an example now to try to show this a bit more visually. If we're thinking about the relationship between two system elements risk behavior and health outcomes, we might have a stronger understanding of the cause-and-effect relationship if we set the boundaries around those two system elements. So, we might have a higher degree of certainty. But if we intervene in this system, how we might be able to change or alter risk behavior in order to effect a health outcome.

But what happens if we draw the boundaries on that system a little bit wider to include the relationships between all of the elements around, for instance, living conditions and risk behavior. So that could be physical environment, housing transportation, social environment, like peer networks, community influences, the service environment in terms of access and quality to different types of services, and the economic and work environment.

When we start to draw the systems boundaries a bit more widely and start to now think about the actions and interactions and relationships between all of these different system elements and risk behaviors, we have a little more uncertainty. But if we intervene at one part of the system, for instance, around shifts in social norms or social networks, how that's going to act and interact with all of those other system factors to influence risk behavior, which we might ultimately be wanting to shift to address changes in health outcomes.

What happens if we set the system boundaries even more widely, taking into account inequities, such as social inequities or institutional inequities? Now we start to see that there's many more relationships, many more variables, and it's more and more difficult to understand and predict how all of these different system elements are going to act and interact within this wider environment over time, not to mention that many different interventions might be happening with different types of system elements, and the sequencing and the timing and the density and intensity of all of these interventions could affect how the other elements act and interact with each other to influence that risk behavior.

So, when you have these different types of systems, where there's high uncertainty about how to intervene and how things are going to change over time, and there's really not a lot of agreement on the best way to intervene to get those different -- to change the system in the way that we want with different people, with different perspectives, whether you're a grass roots advocate or a grass policy intervener, might have different understanding of how you might intervene in that system.

So these types of system dynamics are often called complex dynamics or complexity, and we see that complex systems arise in these types of situations, where you have high uncertainty on how to intervene and disagreement among different type office social actors on how best to intervene to cause a change.

So, in the social sector, systems thinking not only gives us a way to understand how these elements act and interact with each other, but it's also a way of thinking about complexity or complex problems, which

brings me back to the question that I started with. Why is it that the depth and breadth of all of the support is not leading to the ultimate health outcome that we want for all?

Well, now that we're all systems thinking gurus here and systems change experts, let's think a little bit more about how systems change people approach this and, particularly, how we might try to measure some of the changes in these systems. So, if we're trying to understand why a problem is stuck and we can't move the needle, we have to map out that system. We need to set the boundaries on the system that we're talking about. Before we can intervene, we need to understand what is the system that we're intervening in. So, putting those boundaries on the system helps us understand the types of interventions and programs being implemented that are meant to shift the systems function or purpose. From a measurement perspective, it's critical that we set those boundaries so we understand all the different system elements and the relationships and actions between them.

Once we understand the system elements that we're trying to intervene, particularly from a measurement perspective, we have to understand how we want to measure change. What are the different types of changes that we want? Oftentimes the systems changes that we care about the most are so far in the future that it's difficult to know they could take five, seven, or even ten years before you start to see changes, in inequities and health outcomes for instance. So we have to start thinking about what are some ways that we might be able to measure changes along this pathway towards systems change.

One framework that we think is particularly relevant for the work that you're doing and is starting to gain a lot of traction around social sector thinkers who are engaging in systems work is the fixed conditions of systems change, which was recently put out in a publication by FSG. It's called the Water of Systems Change Written by Kania, Kramer And Peter Senge. They talk six conditions that are at three different level. The first is structural changes -- policies, practices, and resource flows -- and these structural changes are more observable changes, so things that you can actually see and observe within a wider system. Also referred to as more of the explicit changes.

The second level is relational changes. Relational changes are sometimes referred to as more of the semi-explicit changes, so a little less observable, changes in relationships or connection, changes in power dynamics. And then the last are transformational changes or implicit changes, things that are harder to observe and harder to measure, changes in deeply held beliefs and assumptions that prevent systems from changing.

I'm going to spend a few minutes talking through each one of these elements to give you a bit more of a definition of each one and why they set us up to understand why systems are changing, and then at the end of this, we're going to do a little bit of an exercise, thinking about different ways that we can measure these conditions of systems change using a MURAL-board activity.

So, the first one are shifts in policy. Policy changes are changes in government, institutional organizational rules, regulations, and priorities that guide an entity's own, or other actions. So this could be an administrative policy. This could be a new workplace policy within an organization. This could be a municipal or a state-wide policy. So things shift in a policy, whether that's at an organizational or institutional or system-wide level that's starting to indicate moving us towards the system change that we want to see.

Changes in practices within the different elements of the system; so new activities, coalitions, networks or other entities that are starting to shift what they do and how they do things to address the change that we're trying to work towards together. This could be through procedures, guidelines, or informal shared habits that comprise the work that they're doing.

And then the third condition on this first level of structural changes is resource flows. And usually when you say resource flows, people think directly about money, and that is one way to think about it. So increase in funding or resources to a particular issue that's aimed at changing a system. But it can also be changes in people, human resources, knowledge and information. so how information flows within a system, how different actors are gaining different types of information or other assets, such as infrastructure that are being allocated or redistributed differently than they were before to address the change in the overall system that we want to see.

We also talk about relationships and connections as the first level of change within the semi-explicit changes or relational changes. This could just not only be new connections but the quality of connections, building trust between groups, between different actors in the system, particularly those with differing histories or viewpoints. So, centering the work of communities that are most impacted by and inequity and making sure that their voice is lifted up and heard in a policy debate than in the past, which relates to changes in power dynamics or the distribution, the decision-making power authority, and both formal and informal influence among individuals or organizations within a system.

So, not just who has a seat at the table to make a decision but what are the even decisions that are being discussed at the table. Who has a role in setting the agenda? Who's setting the narrative around some of this work, the different relationships between these actors in, particularly, groups that have historically been marginalized and discriminated, and making sure that their voices and work is centered in this as well.

And then the last are mental models or the more transformational changes. These are implicit, harder to measure. But a key condition on our pathway toward systems change has a thought on deeply held beliefs and function, by taking progressive ways of operating, the narratives that we have that dictate how we think, what we do, and how we talk. When you start to see individual organizations, leaders, starting to shift the way that they understand and talk about a problem, you start to see changes in these mental models. And all of these six conditions start to provide us a bit more of a framework to understand within the boundaries of the systems that we set, how things are starting to change.

So, once we've mapped out our system, we understand all of the different elements, we've started to map out some of the relationship between them, and we start to think through these six conditions of systems change, we can start to think about different ways to measure these. And what I've put together here is a list of nine methods or data collections sources and different type office methods that one might use to start to measure system-level changes, and different data sources have different abilities to measure different types of systems changes.

So, the first is program and administrative data, particularly good at looking at structural changes. So, for instance, understanding whether a new policy has been implemented or relational changes like an MOU or a formal agreement or a partnership, types of information that you can get from your program partners or other administrative data that's giving you a sense of whether policies are changing, practices are changing, new relationships or connections are being built.

The second is team form and interviews and focus groups. So, some of the big participatory researchers in our field, like Robert Chambers, will always say, if you want to know what's changing, you ask people themselves. And that's really the tenet here, is a well-designed key inform interview or a well-structured and moderated focus group with different types of systems stakeholders together can help us understand all three different levels, structural, relational or transformational changes, so talking to people about new practices or new activities, understanding how trust is being built between different systems stakeholders, understanding how power dynamics are being shifted. By talking to the different groups and understanding how those processes are happening are all different

things that you can do to start to document whether some of these condition of systems change are occurring.

The third are document reviews, secondary analysis, and literature reviews. So, these are the types of analyses that can help us understand whether we're starting to see new behavioral changes, for instance, in different types of populations, or new connections or new service delivery mechanisms being established, thinking about all of the resources that exist already and the different types of documents that are out there that could be used, extracted, help to understand whether we're starting to see shifts in narrative or all of these other changes that we've been talking about.

Another way to think about that is through environmental or landscape scan, so rapid analysis of the different factors that might be surrounding an organization or a particular problem and trying to get a sense about which are the key factors that seem to be important, and how those are changing over time, in addition to the system mapping approaches. So, I talk a little bit about system mapping a minute ago in terms of setting the boundaries for systems.

And I know that you have an upcoming webinar in system mapping, I believe in August, which will give you some more in-depth information on the different types of system mapping approaches. But in the same way that you can map out the different actors in a system or the actions or interactions between the different system elements at the beginning, to understand the current state, repeating those types of systems mapping exercises over time can help you start to understand if changes are happening, and if you're starting to see new connections between actors, or the influence of a certain actor is starting to shift, or power between different actors is starting to shift over time. A more quantitative and specific way to get at this is through social network analysis, which we'll be talking about a little bit more in the rest of this webinar, so I won't be getting into that too much.

Political economy analysis or power analysis, specifically understanding who holds and shares power in a situation, who has a stake, who has something to lose, the winners and losers in a situation, and understanding how different actors who have whole power over and power with start to engage and interact in different ways, whether that’s through new decision-making structures, new ways to hold each other accountable, different ways to drive transparency or accountability between different types of different actors. So, political economy analysis can help to service some of these changes over time.

Also using participatory approaches, like appreciative inquiry or other reflective practices could help this work with different system stakeholders or system actors and create some space for people to get outside of the busyness of the day-to-day and reflect on some of the wider changes that are happening within a system, help you to understand how narratives might be changing. So how working with different groups or listening to these different populations or centering the experiences of communities that are most impacted by some of the inequities, understanding we have to reframe the problem a little bit more or think about new different solutions than we did previously, and thinking about what we've learned and how we might be able to move the future, based on what we learned, to think about different ways that we can move from some of the more explicit to some of the more implicit changes in these conditions.

And then a lot are thinking through media tracking or social media analytics. This is a good way to understand how people are talking about an issue, the narratives or the words or the hashtags that people are using within the media, within social media like Twitter and other analyses, or other social media platforms for instance. The way that people are framing or talking about a problem, are we starting to see a different understanding of that problem over time could help us particularly understand a little bit more of those transformational changes.

So, I've just given you a rapid overview of these nine different methods, and we want to do an exercise to allow you to think a little bit more deeply, particularly around the three first methods here. So, I'm not going to talk about social network analysis, because Russ is going to get into that one in a little bit more detail. But we're going to set up a MURAL exercise now, which is an online virtual collaboration tool to help you start to think a little bit more about three of these key methods, programs and administrative data, key informant interviews and focus groups, and document reviews, secondary analysis, and literature reviews. And what we would like you to do in this MURAL board activity is reflect a little bit on what data you have now and what data you could collect this year if you wanted to start to document and inform a systems change evaluation. If you wanted to start to think about measuring some of these six conditions, the systems change, what are some of the data that you have now, and what are data that you could collect in these three different buckets?

Russ is going to drop a link in the chat for the MURAL board, and for people who aren't as familiar with MURAL, we use MURAL a lot in our facilitation exercises because this is very intuitive and user friendly. But the idea is that it looks like a big sticky board in a virtual space. So you can click into any empty sticky note and begin typing. If you see an empty

space, if you double click on that empty space, you can add your own sticky note, and you can zoom in and out of the board, and there are two different ways to do that. So you can use the cursor on your mouth. If you just scroll the mouse by, you can zoom in and out by scrolling it on mouse, or you can hold the spacebar while you move, and click and drag. And on the bottom right-hand corner of the MURAL board there's a little control panel here, which you can use to also scroll around the board to zoom in and out and navigate around the board.

So, with that, I'm going to stop sharing the screen and allow folks to go into the MURAL board and spend a little time picking through each of these conditions. We're going to start with the first, thinking about program and administrative data. So, the first set of buckets is what data you have now that might help you understand how systems are changing and what data you could collect this year. So, I clicked the six conditions of systems change up here in the upper right-hand corner if you want a reminder refresh of what those are, and at the bottom right here is a bank of top ones or like.

So, as you start to read what other people are starting to add to MURAL board, if you see a source or piece of information that you have or that you could use, feel free to drag that over and drop that onto the board as well so we can start to see where there's more energy around different types of methods. So we'll start off by thinking about the program and administrative data, start to add some of the data that you're collecting now that could help you understand where the policies are changing, practices are changing, relationships are changes, any of those system condition that we talked about, and what data you might be able to collect feasibly in the next year.

And as you're looking through the board, as you're adding on some information here, I'll just let you know that, later on this year, we'll be putting together a resource on measuring systems change, and we want to make sure that that resource is as fit for purpose of the work, all of the good work that you're doing as possible, so we're going to use all of the ideas and experiences that come out of this MURAL board exercises to help us to populate -- excuse me, to help us inform that resource that we'll be working on.

So, let's take a few minutes and think about this first level, and familiarize yourself with the MURAL board and the different ways that it works.

Russell Cole

And while folks are entering information, in addition, I'll just mention, beyond summarizing the information that we get from your contributions to this board in that forthcoming brief, we also plan on sharing with everyone the actual MURAL board from today's webinar, as well as a

copy of the slides. So please know that you'll get all this information back in your hands in the near future.

Drew Koleros

Important to point that out. Starting to see some great ideas popping up in the board. Network meeting attendance list, I think that's an excellent piece of data to start to track not only the frequency and intensity of people coming together but the different types of stakeholders, and that that's change over time. It seems like it's a mundane and routine piece of information, but such a key piece of information to help us understand how relationships are changing, how connections are changing, how different perspectives are starting to enter into the conversation, so I'll definitely click on that one as well as a resource I use quite a lot in my work as well.

All right, I see that people are starting to shift to other parts of the board as well, and feel free to go around the board and use anything as you want. But we'll start to shift the focus a little bit more, at least in the screen share, so the second piece around key informant interviews and focus groups. So who are you talking to now? Who could you talk to to help you understand a little bit more? Who have you talked to help you understand a little bit more about whether practices are changing, policies are changing, resource flows are changing, how people are thinking about an issue, framing an issue, who people are collaborating with, how that collaboration is going?

Really exciting to see that people are doing a lot of this work already, so feedback from you. It's been really exciting to see that people are censoring the work in the groups that we're trying to change the system for and making sure that their voices and their experiences are coming back in to how you're working on this, so that's great to see as well, getting use as well.

And just to say that a lot of these things, we focused on these first few here because I think that people often feel that they have to do something super robust and rigorous and comprehensive to do this kind of systems-change work. But, really a lot of the day to day that you're doing can inform, and providing that framework around the six conditions of systems change that we did is really helping you to structure different ways that you can start to document these things using a lot of the routine data that you could be collecting from other reasons. So you might be doing surveys of stakeholders or others for other purposes, and a lot that information could be used to also help you document some of the conditions of systems change happening on our journey toward addressing some of the outcomes that we wish to do through this work, so it's great to see that.

All right, and let's start to move down to the last one. This one is really to get you thinking a little bit more about what are the existing data out there, whether these are pieces of information that exist for different types of datasets that you might be able to exploit and go through to help you understand, in general, what are some of the narratives around this issue or what are some of the key connections between different groups, what are some of the major policies that are dictating some of the work of the different systems stakeholders.

Evaluation reports and other work is a really great data source, so oftentimes evaluations has to be too biased as an evaluator, but I think that evaluations do a great job of setting that wider context, and looking at those evaluations from different perspectives as well can help. Policy analysis is another great example. So, sometimes these not just policies like big P policies of municipal or state level, but even understanding how organizations might have changed their policy around referral mechanisms, different things like that can help you understand a little bit more about the different policies and the way that these are showing up in different organizations.

So, we're going to leave this link live. You'll have that link from the chat, and we'll keep it open for a couple days. Feel free to keep going and consult that. Then we'll type all of this up and share it with you. But for the interest of time, I'm going to go back to our presentation here, and then move to the second portion, which is an introduction to social network analysis.

Russell Cole

Thanks so much, Drew. I'm looking at our time. We've definitely got a lot of content to get through, so I'll do a very quick introduction and demonstration of network analysis, because it's such a powerful method for describing the status and structure of relationships within the system.

So what is social network analysis? I like this top simple definition. It's an approach for measuring and mapping relationships. Network analysis allows us to examine how the configuration networks influences how individuals and groups or organizations or systems as a whole function. So, oftentimes, we think about visual presentations of social networks and these visuals nodes or varuses represent the individuals or organizations and the links, and the edges between those nodes represent the relationships or the interactions between individuals. And the collection of node and links is a network; that's an interacting system you see. Beyond a visual presentation, social network data can also be presented as matrices or summarized in descriptive statistics to enable researchers to quantify the networks or relationships.

So, why are we diving so deeply to network analysis here? These networks are relevant for systems evaluation. These network data can be useful for describing the boundaries of a system, the relationships and the agents within a system. It allows you to see how those relationships evolve over time and how folks interact with different types of relationships. Next slide, Drew.

Here an illustration of a social network diagram from a systems change evaluation about supporting evidence-based home visiting I used to work on. Like the IIN project, in this project, organizations or grantees receive federal funds to work with partner agencies. But in this project, it was to select, implement, and support evidence-based home visiting models for their [inaudible] populations.

So, here, I'm showing a simple network of 11 organizations. They're deidentified in this figure. The grantee that received the funds is shown as a black node. Other organizations that are implementing agencies or referral partners and funders, they're shown in grey. The edges are ties between these organizations, show a particular type of collaborative relationship. And here I'm showing the strategic planning network. This is where grantees and partners described who they talked to about program development and overarching planning work.

So, the diagram suggests that most of the organizations are talking with each other about strategic planning. It actually shows that the grantee, that black dot in the center, seems to be really central to the interaction. Nearly everyone is saying that they're talking to the grantee about this future plan. I don't really want to get too far with this right now. I just want wet your palate of initial administration of social network analysis, since today is more about highlighting, and not getting too deep. Next slide, Drew.

You just saw a visual of a network. But the network itself can be considered quantitative data. There's this underlying matrix. It's a collection of data in the rows and columns that shows how all of the organizations in that network are connected to each other. When we're doing social network analysis, there's a huge number of statistics that can we can draw on to describe that network. For example, there are some that are shown here. The network size is the number of nodes in the diagram. How many orgs are in your partnership, that's the size. Isolates, that's the number of organizations that are completely disconnected from the network. So, for a given type of relationship, are there any organizations that don't have any communication or relationships with other organizations? If those organizations are important, and presumably they are, that might signal a potential problem with the potential performance of the system.

Density, this is a statistics that's hardly the degree to which nodes are connected to each other within the network. It's one of the most commonly reported statistics that folks use to understand the overall amount of communication within a given network. If there aren't a lot of lines in the diagram, that's going to be reflected as a low-density statistic, and, again, this might represent a potential limitation in the performance of the network. This is really just scratching the surface. This a lot more familiar statistic that can be used to answer lots of different types of question about the performance of the network or the structure of the network. But people like me like these statistics because they allow you to do comparisons and look at how different statistics vary across different types of relationship networks, or looking at how networks change over time. Let's look at another example to try to highlight this.

I'm going to talk now about a different systems change project we worked on here at Mathematica a few years ago, oh, a decade ago, more than a few year ago. This is called the Integration Initiative. It was seeking to bring about systems changes or geographic boundaries around stakeholder groups, around disciplinaries. This is an actual network that shows the collaboration network among organizations that worked together in Detroit at the start of a project. Unlike the previous graph, now the lines between organizations represent the strength of their collaboration, with thinner lines representing weak infrequent communication and thicker lines representing more frequent, more substantive conversation.

Depending on your project's goals, you might want to have a more detailed measure of how frequently or the quality of the interaction among network members. That is feasible. It could be done in this project. When I look at this graph, I see lots of interaction. There's lots of connections. It's a pretty high density statistic, though I will say that many of them are pretty weak. And one organization seems relatively less connected to the other organizations in the network, that one in the bottom in blue, I guess. Thanks for showing us, Drew.

So, in the study, we actually were able to collect pre and post-network data to enable us to see how those interactions changed over time. So, take a quick look again at that bottom of the graph. Drew, if you could just move forward on the slide, yeah, we can see a snapshot of how this network looked 18 months later, after the grant was funded. You can see that there's more lines and that the strength of the lines has increased substantially. That organization at the bottom that was somewhat disconnected has many more connections with other organizations at this point.

If we look at the network statistics, the density, that's the total proportion in the system, it's increased by 13 percentage points. The idea here is to

show you that, with network data, it's possible to quantify change in something that's very hard to conceptualize, like relationships. This is really helpful for reporting dissemination. Again, this is really just scratching the surface, just trying to showcase the potential of this approach rather than hand holding you through this work. But in the spirit of keeping things at a high level, let's move on.

So, let's talk about where these data come from. There's lots of different ways of doing it. This slide gives you a really course sense of how it can be done. First, you need to think about what your unit of analysis is going to be. Often in these systems change evaluations, it's most useful to think about organizations or departments within large organizations that are connected in a system change evaluation to think about interorganizational networks rather than interpersonal networks. I'm assuming that that's how you're thinking about things. You'll want to start with an initial list of the organizations, the initial boundary of the system, which you might already know from some real work that you've already done for your IIN grants.

You'll want to identify a knowledgeable person within that organization to serve as a respondent for that org. The idea is that they are going to be able to talk about their organization, their relationships that they have with other organizations and your partnership, and so it's important to get the right person who really knows about the interorganizational relationships. Then you're going to collect data about that, about the relationships. Maybe you'll do a survey. Maybe you'll do an interview. The key idea is to try to get the data on the types of relationships that are important to your work, who was involved in that relationship. Maybe it's planning. Maybe it's innovation development. Maybe it's about evaluation of data collection, the stuff that's shown here. This is an illustration of the process by which you can collect those relationship data that undergirds a social network analysis. Next slide.

In case you're wondering what this might look like in a survey, here is an example item from the home visiting project I was talk about earlier. The introduction to the question acknowledges that is organizations within the partnership work on different activities together. This question is specifically about strategic planning or other program development activities. The way it would look in the actual survey is that there would be this list or this roster of all of the other organizations that are in the partnership. Those are the folks that are in the system. They would be shown like that green highlight in the down arrow on the bottom of the slide.

As a respondent to the survey, you would indicate yes or no to whether you're engaged in the strategic planning activity with any of the other organizations. That would be a way to show how your organization is

connected to the other organizations in the network. And when the survey is administered to everyone in the partnership, you'd end up with the network data that you could then visualize and quantify. There's a lot more too it, but hopefully this is enough to plant the seed for what network data are, how to get them in case you want to dip your toes in this.

And you're probably saying to yourself, this is great and all, but I'm getting to the end of my grant. Even if I wanted to do it, it's too late; right? And I would say, "No." There are some limitations, but it is still definitely feasible. The example I showed you before of how the Detroit networks changed over time, that was actually collected in a single survey. The survey was administered towards the end of the grant, like where you are right now, and we asked participants to respond to two sets of network questions. Who do you have relationships with now? Who did you have relationships with at the start of the grant? And collecting these retrospective data, in addition to the current network data, allows you to show how individual relationships changed. It might also help you to show how the boundary of the network changed over time. You knew who was in the network when you started your grant, the initial application. Some new folk may have been added over time.

I'm trying to make the case that this is feasible. Like, you can do this now. There are some limitations certainly. Folks might not be the most accurate or reliable respondents about the relationships they had a few years ago. But if you're trying to coggle together this piece of your systems-change story, it is feasible, it is possible to do it now if you want to address this piece of the puzzle. Next slide, please.

So, in sum, social network analysis is a means to do some of the things that are shown here, the quantifying aspects of system boundaries and relationships. This is really just part of that systems change evaluation framework. It really helps you to understand aspects of relational changes from Drew's six conditions, but it's often the ones that folks have the least experience with, which is why we wanted to give folks a tiny bit of this information today. I've said it a number of times, we're really just scratching the surface here. If you want to dig deeper, talk to your eval team liaison who can be more of a resource and can bring together other members of our TA team who had this experience to a future call. Next slide, please.

So, what I want to try to do quickly is bring this together as it relates to the broader IIN grant project. How does systems change evaluation fit, and what's it its role in this grant? So we know that several grantees have argued that the nature of their grant is to transform the existing system and that this grant has made fundamental changes to the way that organizations and their networks work with each other. And we know that

several grantees have asked for some guidance on ways to comprehensively measure and document how the system has changed. So Drew has talk about the six conditions of systems change, how to measure them as a framework for documenting systems change, and you've given some ideas on how to measure and document the things that are shown here.

And the benefit of the approach that Drew laid out is that it's based on some really well defined categories and ides for measurement that are feasible, that are tractable, and that are embedded in in this literature base. It might help you to see how the data that you have in hand can help the story and whether there are any gaps in the story that you need to fill with other data sources. So, hopefully, this helps folks think about ways of documenting and reporting on how aspects of their system have changed over time. Next slide, please.

I do want to quickly mention something about reporting, given that this field cares a lot about whether there's evidence or effectiveness that comes out of a study or an evaluation. When we do these types of systems change evaluations, we're often measuring and reporting on tons of characteristics. What did the system look like originally? How did it change over time? How have perspectives and relationships changed? You might even have some outcome data show how folks who actually are receiving services are changing over time, things like changes in risky sexual behaviors or STIs or pregnancies.

Here is the wrinkle; in nearly all systems change evaluations we don't have data from counterfactual condition. We don't know what would have happened to the organizations in the system in the absence of the grant. We don't know how relationships might have grown or how perspectives may have changed or how goal might have evolved. We typically only measure this information among the individuals and organizations that are engaged in this work. So, as a result, systems change evaluation activities should generally be presented as descriptive evidence. Its purpose is to try to explain aspects of change but not to attribute anything as causal evidence of effectiveness.

It's certainly important information to show, but we just want to need to characterize it appropriately, and not overstate any improvements in the system as being solely attributable to the systems change process. That's not the type of research question that these evaluations are typically attempting to answer, and we should make sure that we're not misattributing the findings from these types of studies inappropriately.

I'm just going to quickly say this. It's not that if you can't do a vigorous RCT about systems change process. You certainly can design something

to do this. But for our group of grantees, I don't think anyone is doing this, so we shouldn't necessarily talk about any changes that we observe as evidence of effectiveness. Next slide, please.

So, one other thing to mention, and it's something worth highlighting as part of a systems change dissemination activity, it's really that going back to that start of the presentation. The ultimate goal of this grant is really to develop one or more innovative interventions. So. documenting those innovative interventions as something that was an output of the systems change process is hugely valuable, hugely important, and this finding can supplement the improvements in the six conditions that Drew talked about earlier as the more traditional measures of systems change.

You know, ideally, you're going to highlight the promise of one or more interventions in terms of its innovativeness, addressing its needs and gaps and accessibility. That's a big win, and it would be great to not only show that the intervention has been created but, ideally, also showing foundational information on the potential promise of the program through measurement and improvement of outcomes in its logic model, or even doing something like a small pilot evaluation. Doing what this grant asked of you to address the needs of your key priority area can be framed as a huge system change plan.

I'm mentioning this, because the expectation of this grant is a great way to further make the case about the promise of the systems change approach. You just need to make the argument that one of the expected outputs of the systems change process is exactly this development of innovative interventions. It's just connecting the dots. Make the argument in your dissemination product that your success in creating an innovative intervention is something that the systems process was trying to do. Next slide, please.

So, thanks everyone for listening. I know that we're running very close to end of our time. This is a lot, and if you need help, you're going to get it from your eval TA liaison. But I want to mention this right now, because we are running close to the end of our time. We are going to do an office hours. Drew and I are going to get on a WebEx and talk system evaluation with anyone that wants to chat. We know that some folks might want to call in and ask questions, or if you want to just listen in, there's an opportunity for folks to do that. It's going to be June 1st, at 3:00 p.m. Eastern.

Drew and others are going to be putting together a brief on systems change evaluation. It's a work in progress. It's going to lift up information from today's MURAL activity. We'll let people know when that's ready to be disseminated. And we just also wanted to also mention that we are

going to be doing a webinar on June 8th, about core components of programs. We think this is a really nice way for folks to think about your innovative programs and disaggregate them and their ingredients. We can help you with ways to report out some of the information that this systematically and concretely will be right. We'll do that in about a month.

So, I apologize, we're really at time. I just want to let people know this is our contact information. These slides will be shared, along with the MURAL board. There are plenty of resources that we've got in the next few slides that Drew can show you, and there's also a number of materials that RHNTC put together on systems change that we've got in that final slide.

So, I apologize that we've gone all the way to the end of our time today. But if anyone does have any questions, we don't have anything that has been submitted, but if anyone has any very quick questions, we can do that, otherwise, we'll plan on chatting again during the office hours in early June. Thanks, Amy.

Again, we apologize for running straight to the end. Great feedback during the MURAL activity, you all, and we look forward to continued conversations in the future.