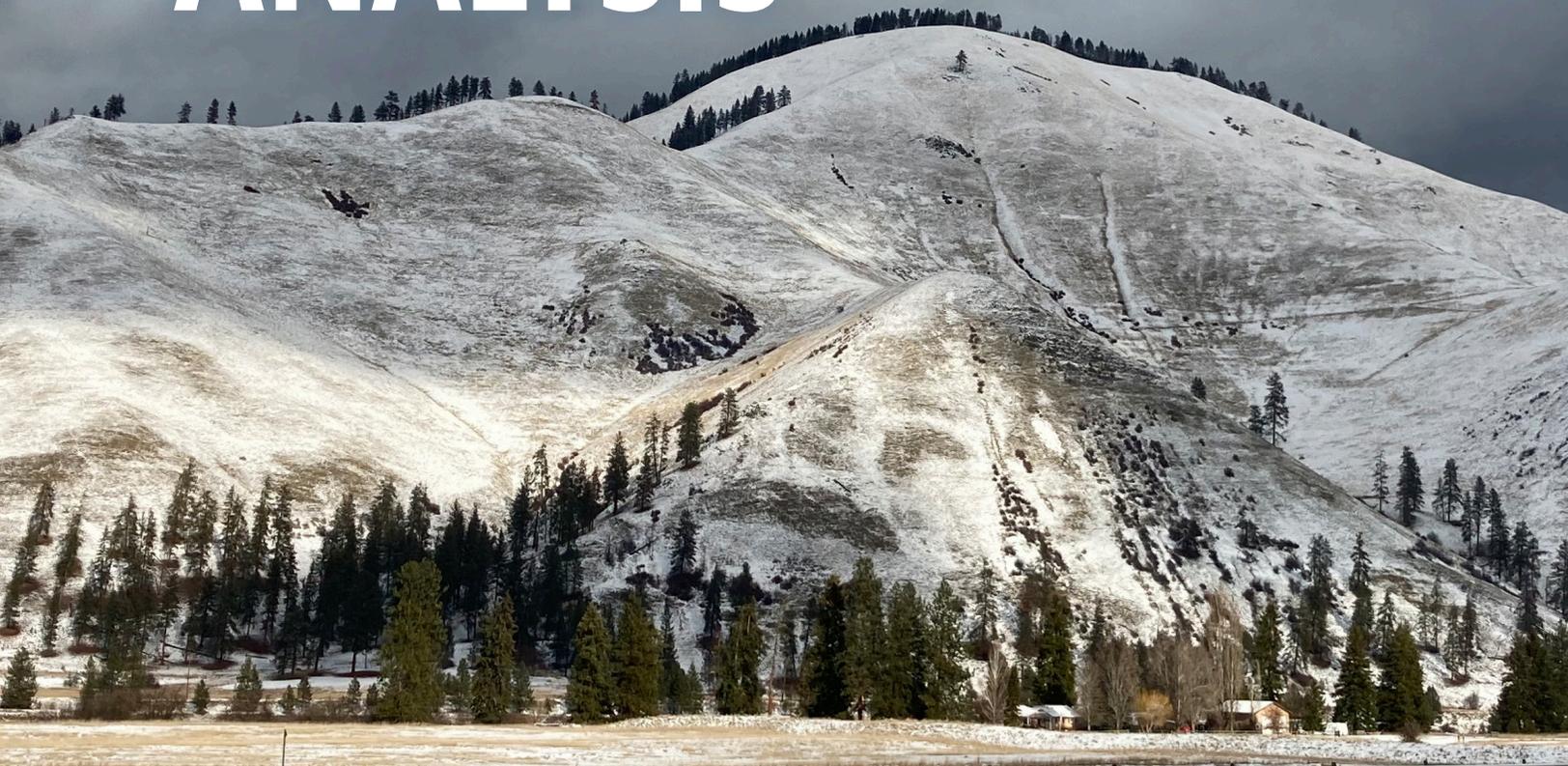


Zero to Five
Mineral County
Collaborative

January 2021

SOCIAL NETWORK ANALYSIS



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Executive Summary

Background

The Zero to Five Mineral County Collaborative (which became the Family Connections Collaborative) was established in December 2018. The Family Connections Collaborative is a subgroup of the Healthy Communities Coalition. The University of Montana Center for Children, Families, and Workforce Development partnered with local Zero to Five Collaboratives to conduct a social network analysis (SNA) October 19, 2020 – December 4, 2020, utilizing the PARTNER (Program to Analyze, Record, and Track Networks to Enhance Relationships) Tool [1]. The research team invited 34 organizations and 5 parent/community members in the Mineral County Healthy Communities Coalition to participate in the survey. Of the 34 organizations in the network, 22 (65%) respondents completed the survey and 2 partially completed the survey, totaling 24 respondents (71%).

Network Composition

The Mineral County Healthy Communities Coalition includes organizations from seven sectors, with Health & Health Care (33%) as the sector with the highest representation. Members are from Mineral, Missoula, and Sanders County.

Partnerships

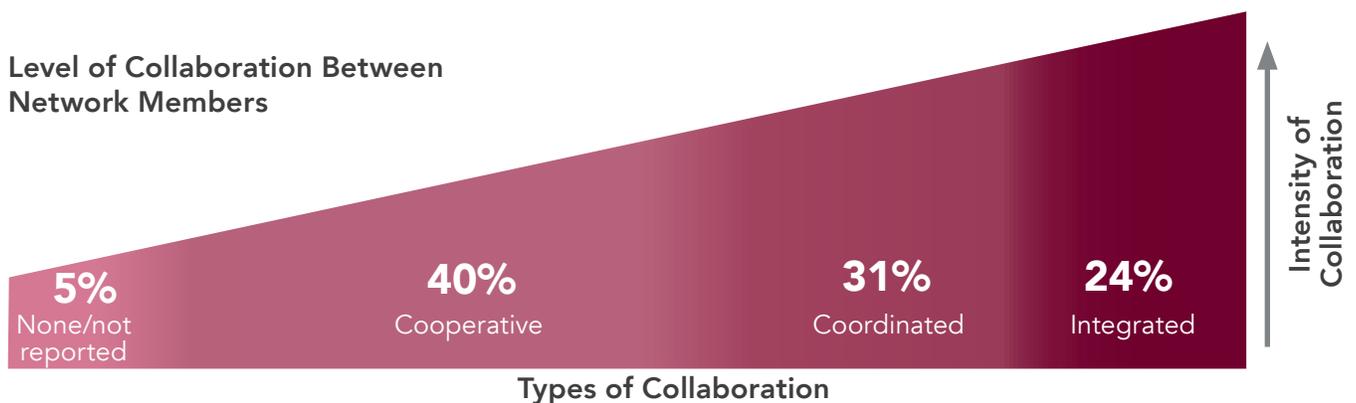
Network members reported the partnerships they have with other organizations in the network. For this social network analysis, “partnership” is defined as the relationship between member organizations that worked together on an early childhood project in the last year. Nineteen organizations reported 128 partnerships across the Mineral County Healthy Communities Coalition.

Close to a quarter (23%) of respondents credited relationships to the Mineral County Healthy Communities Coalition.

Levels of Collaboration

Network members classified their relationships with other members as cooperative, coordinated, or integrated. Cooperative activities involve lower levels of collaboration (e.g., exchanging information), and integrated activities are the highest form of collaboration (e.g., shared programming, joint proposal).

Level of Collaboration Between Network Members



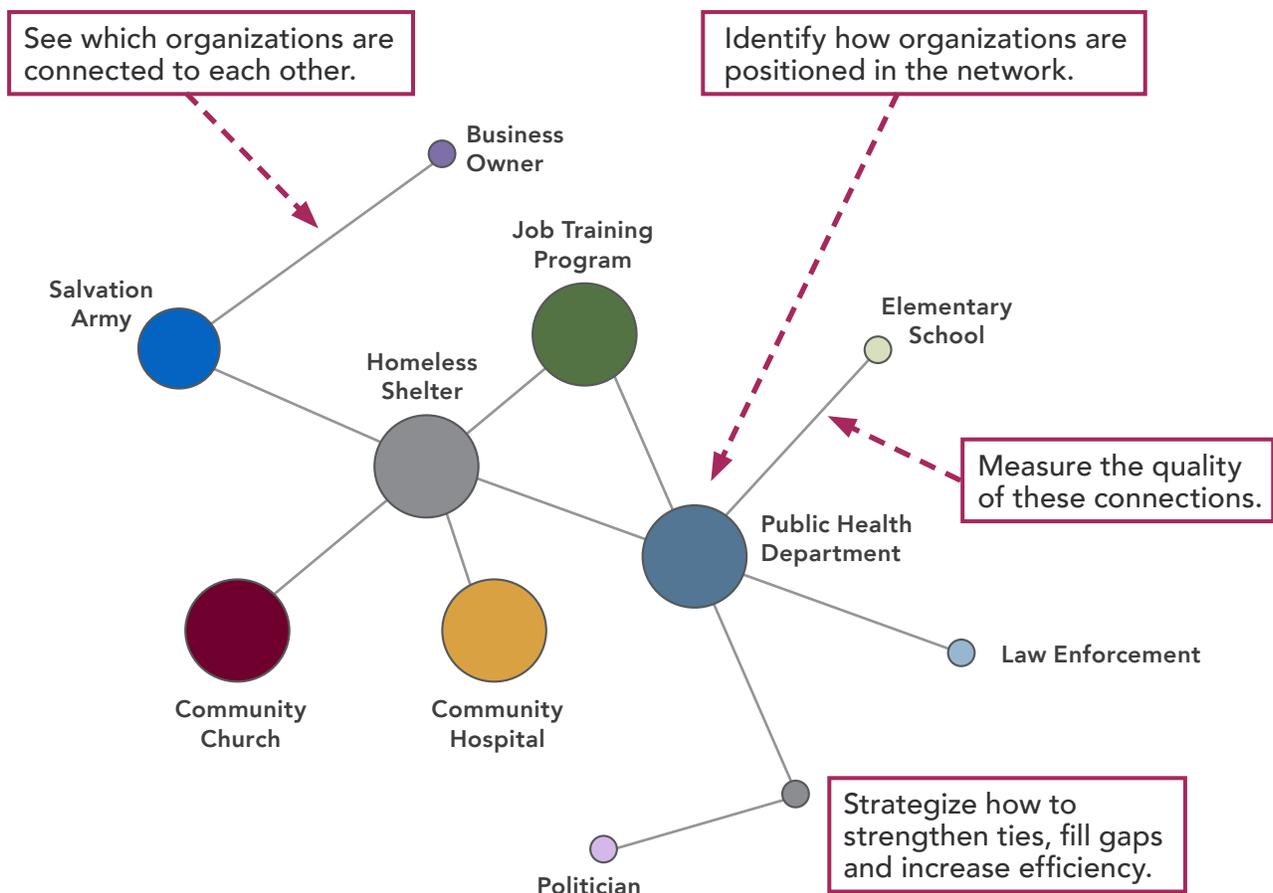
Network Impact on Members

Network members reported that participation in the Collaborative helped their organization share information with other organizations (75%), make meaningful connections with other organizations (71%), and positively impact children and families (71%).

What is Social Network Analysis?

Coalitions and collaboratives are frequently established to bring together partners from both the public and private sectors to address complex health and social issues [2]. Even though collaboration is key to improving community health, there is often little emphasis placed on measuring how collaborative networks build capacity and evolve [3].

Social network analysis (SNA) is a research methodology that measures how organizations participate in a network and the quantity and quality of relationships between partners [4]. SNA can help networks identify ways to improve how partners work together to achieve desired outcomes. SNA can inform strategies to strengthen relationships, leverage resources, and monitor change in networks over time.



KEY



Image adapted from Visible Network Labs
<https://visiblenetworklabs.com/>

Zero to Five Mineral County Collaborative Social Network Analysis

Background

The Mineral County Healthy Communities Coalition has been working to enhance community health since 2012. The Coalition seeks to minimize duplication and leverage resources across various programs promoting health and well-being. The Coalition started as the Best Beginnings Early Childhood Coalition and in 2014 became the Healthy Communities Coalition expanding the focus to address a broader range of community health issues.

The Zero to Five Mineral County Collaborative (which became the Family Connections Collaborative) was established in the Fall of 2018. The Family Connections Collaborative is a subgroup of the Healthy Communities Coalition and includes the Parents as Teachers Home Visiting program, Zero to Five, and Early Childhood Coalition. The subgroup leads all the early childhood initiatives in the county. In the Fall of 2020, the Healthy Communities Coalition participated in a social network analysis (SNA) study.

Methods

The Center for Children, Families, and Workforce Development conducted the SNA survey from October 19, 2020 to December 4, 2020, utilizing the PARTNER (Program to Analyze, Record, and Track Networks to Enhance Relationships) Tool [1]. Network members reported when they had a partnership with another organization in the network. For this social network analysis, “partnership” is defined as the relationship between member organizations that worked together on an early childhood project in the last year. The network and organizational level measures included:

- **Density:** the number of relationships reported as a fraction of the total number of possible relationships across the entire network.
- **Value:** the average of all members’ ratings on their partners’ value to the network in three areas *level of power and influence, level of involvement, and resource contribution* (all items were rated on a scale of 1 “not at all” to 4 “a great deal”).
- **Level of Collaboration:** the proportion of all relationships reported as *cooperative, coordinated, and integrated*.
- **Attribution:** the proportion of all relationships attributed to the Zero to Five Collaborative.
- **Degree of Centrality:** the number of connections an organization has to others as a proportion of all possible connections.

Survey Respondents

The research team invited 39 organizations and 5 parent/community members in the Mineral County Healthy Communities Coalition to participate in the survey. Of the 34 organizations in the network, 22 (65%) respondents completed the survey and 2 partially completed the survey, totaling 24 respondents (71%).

Additional information on the methodology is in Appendix A.

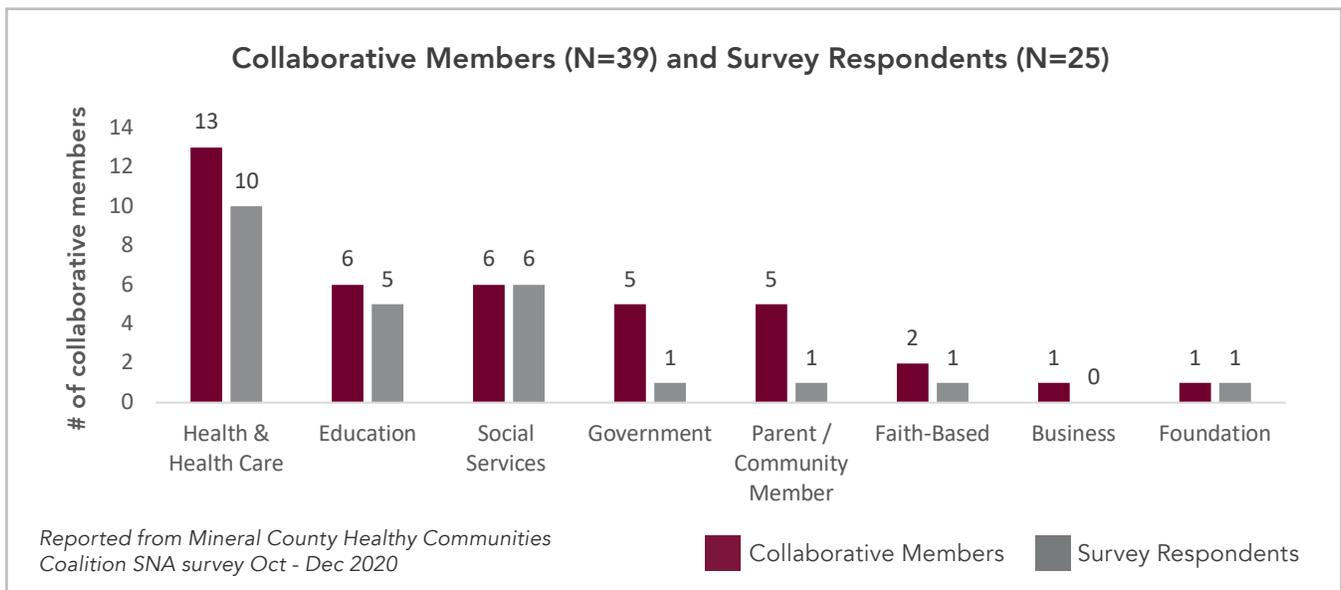


Results

Network Composition

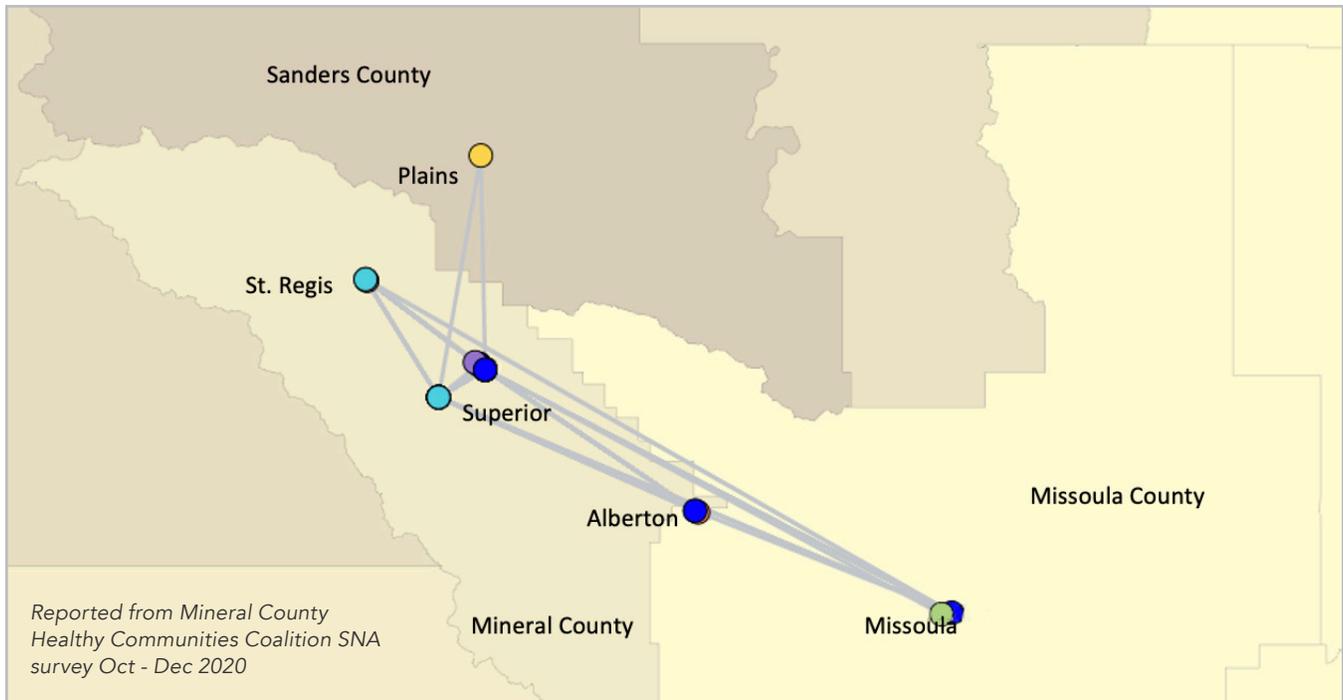
The Mineral County Community Coalition includes organizations from seven sectors, Social Services, Education, Health & Health Care, Government, and Business. Parents and community members not affiliated with an organization also participate in the Collaborative. In Figure 1, the maroon bars show the number of collaborative members by sector, and the grey bars show how many network members from each sector completed the survey. As illustrated in Figure 1, the distribution of survey respondents in our sample resembles most of the sectors that comprise the collaborative, aside from the Government sector and Parent/Community Members, which had limited participation. The sectors with the highest representation in the Collaborative include Health and Health Care, followed by Education and Social Services (Figure 1).

Figure 1. Coalition Members and Survey Respondents by Sector



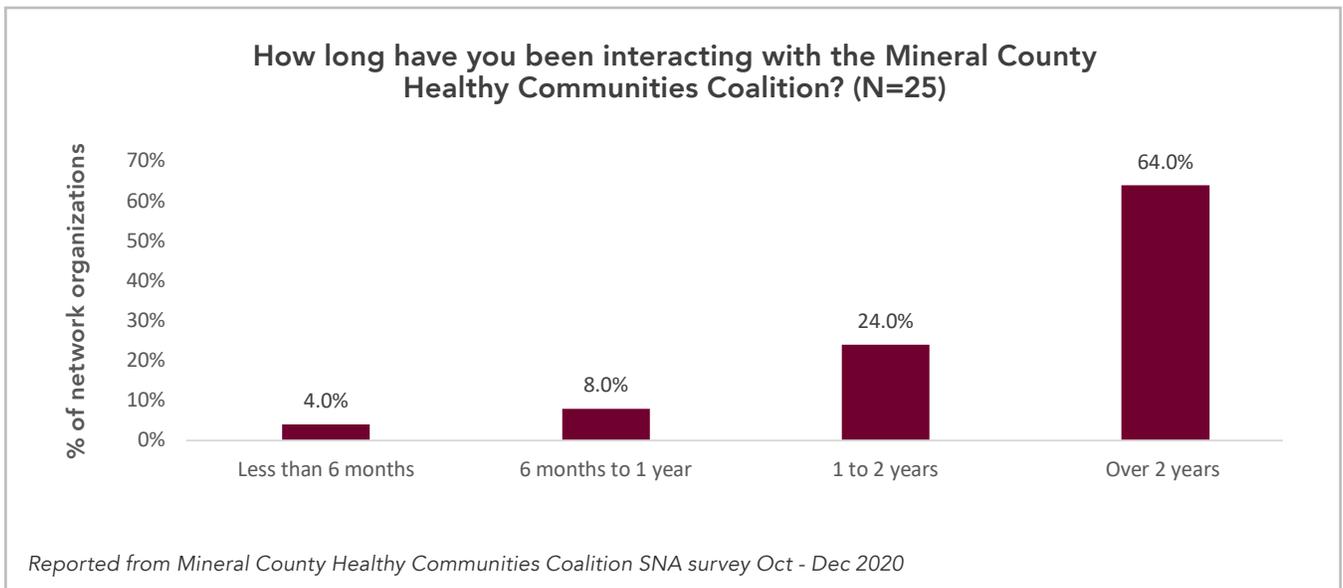
The Mineral County Healthy Communities Coalition includes members from across the county with representatives from Superior, Alberton, St. Regis, and neighboring counties Sanders and Missoula County. In the GIS network map in Figure 2, the circles represent organizations that participate in the Mineral County Healthy Communities Coalition. The lines show relationships between organizations.

Figure 2. Geographic Location of the Mineral County Healthy Communities Coalition Members



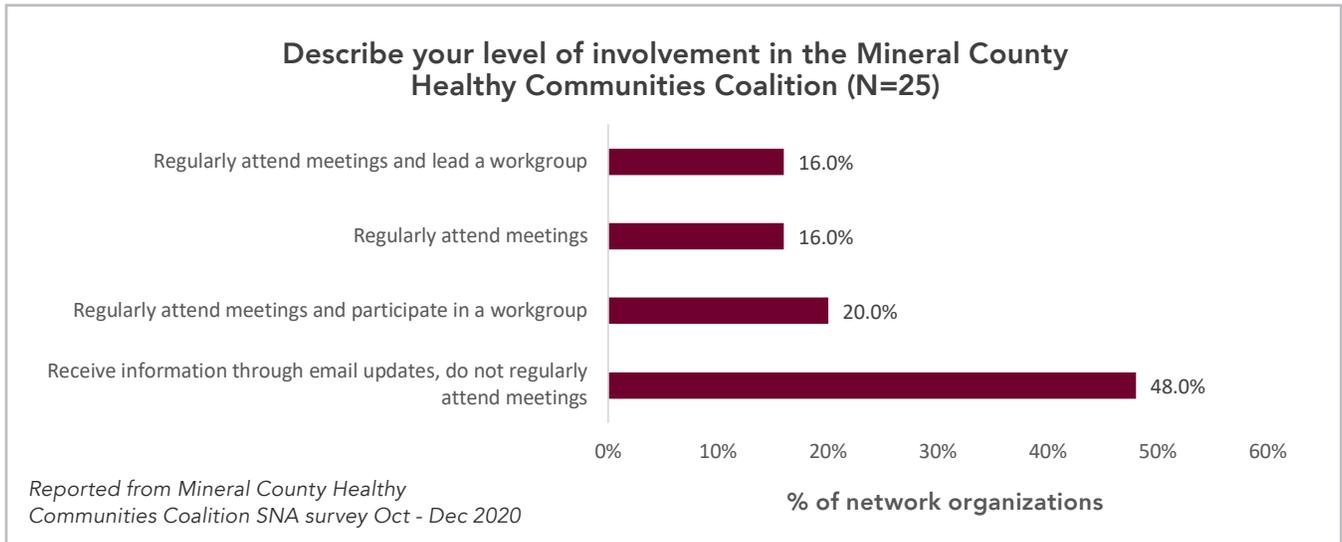
Network members reported how long they have been interacting with the Mineral County Healthy Communities Coalition. Most respondents (64%) have been involved for over two years (Figure 3).

Figure 3. Length of Involvement in the Mineral County Healthy Communities Coalition



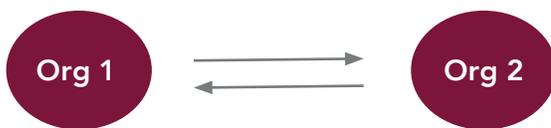
Network members can participate in a variety of ways in the Mineral County Healthy Communities Coalition. The least intensive form of participation involves staying connected through email updates from the Local Coordinator. Other options to participate include attending meetings, participating in a workgroup, and leading a workgroup. In the Mineral County Healthy Communities Coalition, 48% of members receive information through email updates and do not attend meetings, and 20% regularly attend meetings and participate in a workgroup (Figure 4).

Figure 4. Levels of Involvement in the Mineral County Healthy Communities Coalition



Quantity and Quality of Connections Between Members

Network members reported the partnerships they have with other organizations in the network. For this social network analysis, “partnership” is defined as the relationship between member organizations that worked together on an early childhood project in the last year. The survey instrument asked respondents to select organizations with whom their organization has a partnership. Nineteen organizations reported 128 partnerships across the Mineral County Healthy Communities Coalition. In the image below, each arrow represents a reported partnership.



About a quarter (23%) of respondents credited relationships to the Mineral County Healthy Communities Coalition, and 67% of respondents credited the Coalition for strengthening pre-existing relationships (Table 1).

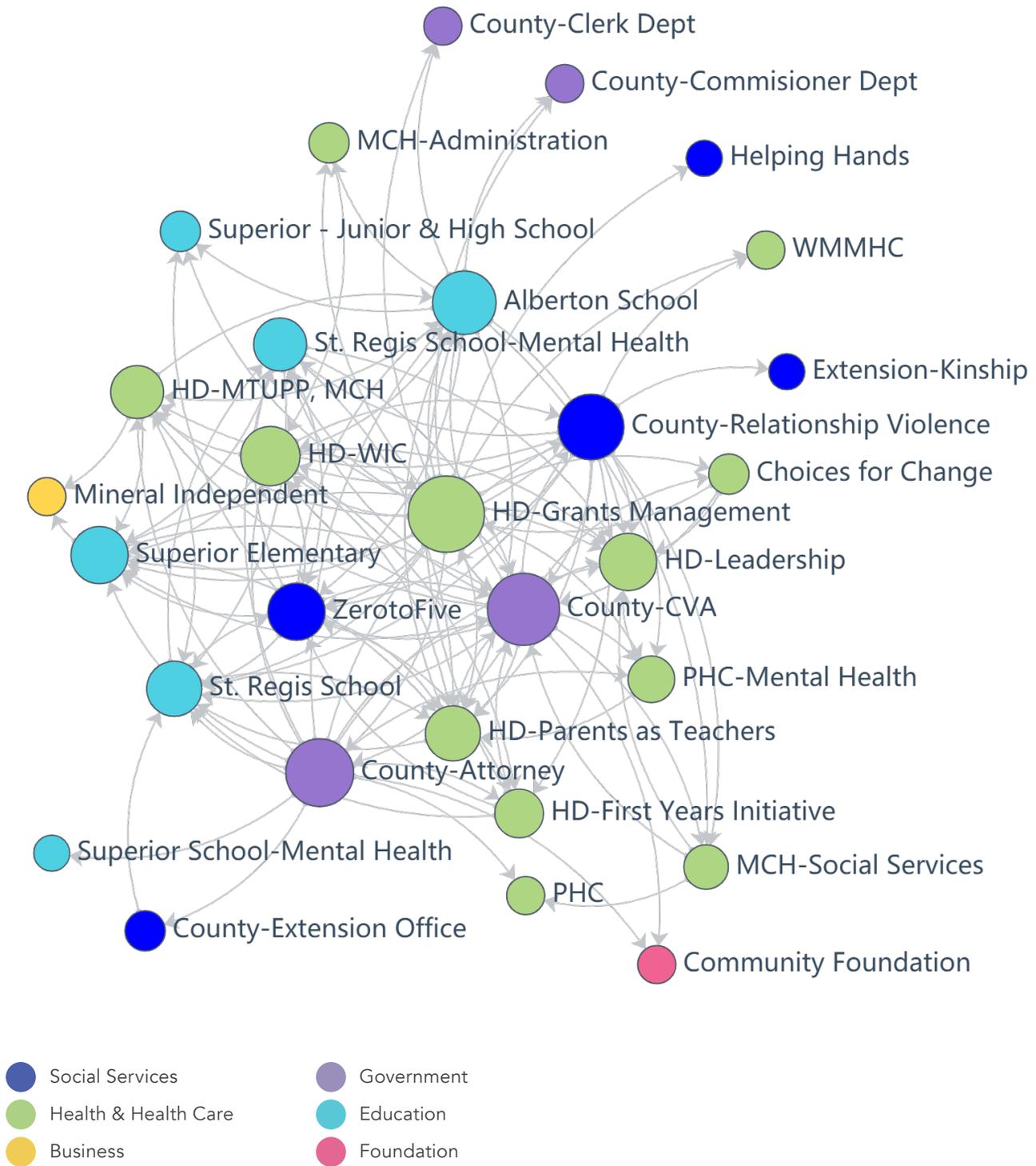
Close to a quarter (23%) of respondents credited relationships to the Mineral County Healthy Communities Coalition.

Table 1. Relationship Development

Describe how your relationships with each of these partners started (N=128)	n (%)
Through the Collaborative meetings, trainings, or other activities	29 (22.7)
Our relationship was not initiated through the Collaborative, but the Collaborative made our relationship stronger	86 (67.2)
Other	8 (6.3)
Don't know	2 (1.6)
No response	3 (2.3)

The network map (Figure 5) includes colored circles that each correspond to one member of the network. The lines show relationships between network members. Circle colors denote the organization's sector, and circle sizes denote the number of connections the organization has to other organizations in the network. Circle size increases to indicate increasing levels of organizational integration in the network.

Figure 5. Mineral County Healthy Communities Coalition Network Map



Reported from Mineral County Healthy Communities Coalition SNA survey Oct - Dec 2020

Degree Centrality

The degree of centrality measures an organization's position in a network. It provides information on how many connections the organization has to other partners [6]. Organizations with high degrees of centrality maintain many ties across the network, and those with few ties have lower degrees of centrality [6]. Centrality provides information on each member's role in the functioning of the network. It shows if one or two organizations are the primary points of coordination or if most organizations hold similar positions [7].

The network's functioning appears to be supported by several organizations with moderate degrees of centrality. Mineral County Health Department-Grants Management has the highest degree of centrality at 63%. The four other Health Department programs in the network have moderate degrees of centrality ranging from 27% - 37%. Several communities across the county have organizations with moderate degrees of centrality, Missoula County Relationship Violence Services (45%), Alberton School (42%), and St. Regis School (30%).

Density

Density provides information about the overall cohesion of the network. It captures where connections are present between network members [3]. Network density compares the number of actual ties in a network with the total number of possible ties [7].

The network has a density score of 11%. The low-density score reflects a sparsely connected network, meaning not all organizations in the network are closely connected to all others [8]. The network has significant breadth with a diverse set of partners from across the county and neighboring counties. While breadth can lead to various perspectives and contributions to the network, it can also create challenges in building close ties between partners with significant organizational differences [7].

Value

Value measures include power/influence, level of involvement, and resource contribution. These represent different ways organizations bring value to the network. For this social network analysis, "partnership" is defined as the relationship between member organizations that worked together on an early childhood project in the last year. The survey instrument asked respondents to select organizations with whom their organization has a partnership, and to evaluate that partner on their power/influence, level of involvement and resource contribution. Network members rated partners' on their value to the network in these three areas from 1=not at all, 2=a small amount, 3=a fair amount, 4=a great deal. Table 2 shows the mean network value score across the three value measures.

Table 2. All Members' Perception of Value Mineral County Healthy Communities Coalition

Value Measures	Definition	Partnerships	Value Score
Power/Influence	This partner holds a prominent position in the community by being powerful, having influence, success as a change agent, and showing leadership.	128	3.4
Level of Involvement	This partner is strongly committed and active in the partnership and gets things done.	127	3.5
Resource Contribution	This partner brings resources to the relationship like funding, information, or other resources.	126	3.3



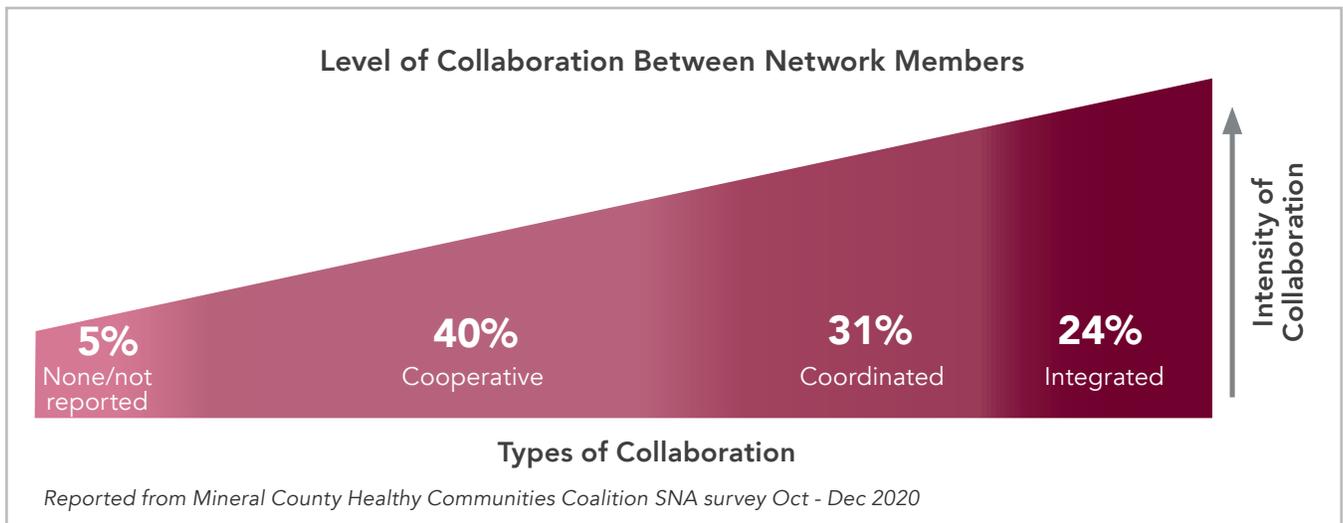
Levels of Collaboration

Network members classified their relationships with partners as cooperative, coordinated, or integrated [1].

Cooperative	Coordinated	Integrated
Involve exchanging information, attending meetings together, and offering resources to partners.	Include cooperative activities in addition to intentional efforts to enhance each other's capacity for the mutual benefit of programs.	In addition to cooperative and coordinated activities, this is the act of using commonalities to create a unified center of knowledge and programming that supports work in related content areas.

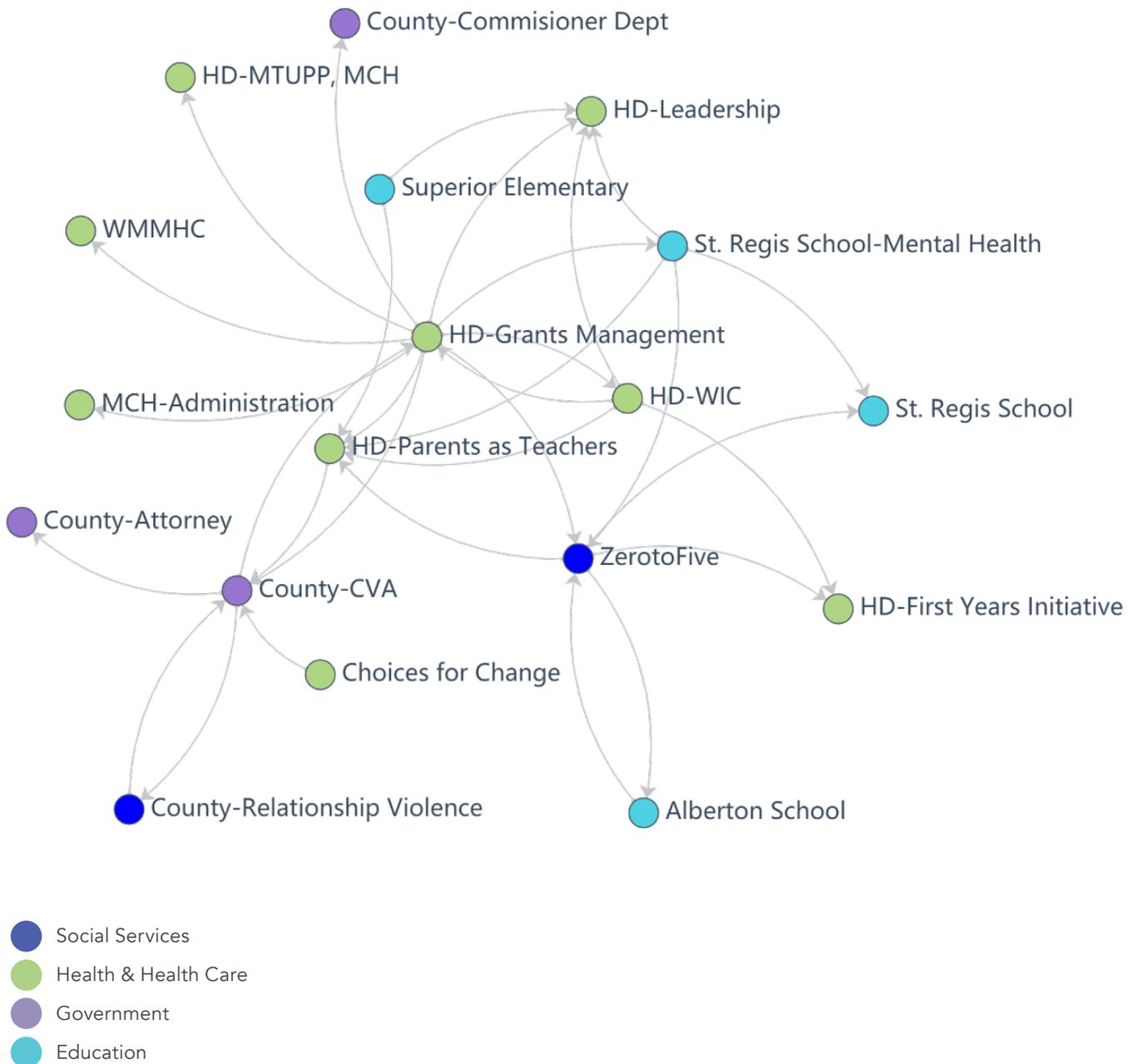
Network members classified most relationship activities as cooperative (40%), followed by coordinated (31%) and integrated (24%) (Figure 6). The Mineral County Healthy Communities Coalition has a strong history of collaboration, as shown in the high percentage of relationship activities that are coordinated and integrated.

Figure 6. Level of Collaboration Between Network Members



The network map below shows the partners with integrated relationship activities (24%), the most intensive type of collaboration (Figure 7).

Figure 7. Integrated Relationship Activities between Network Members



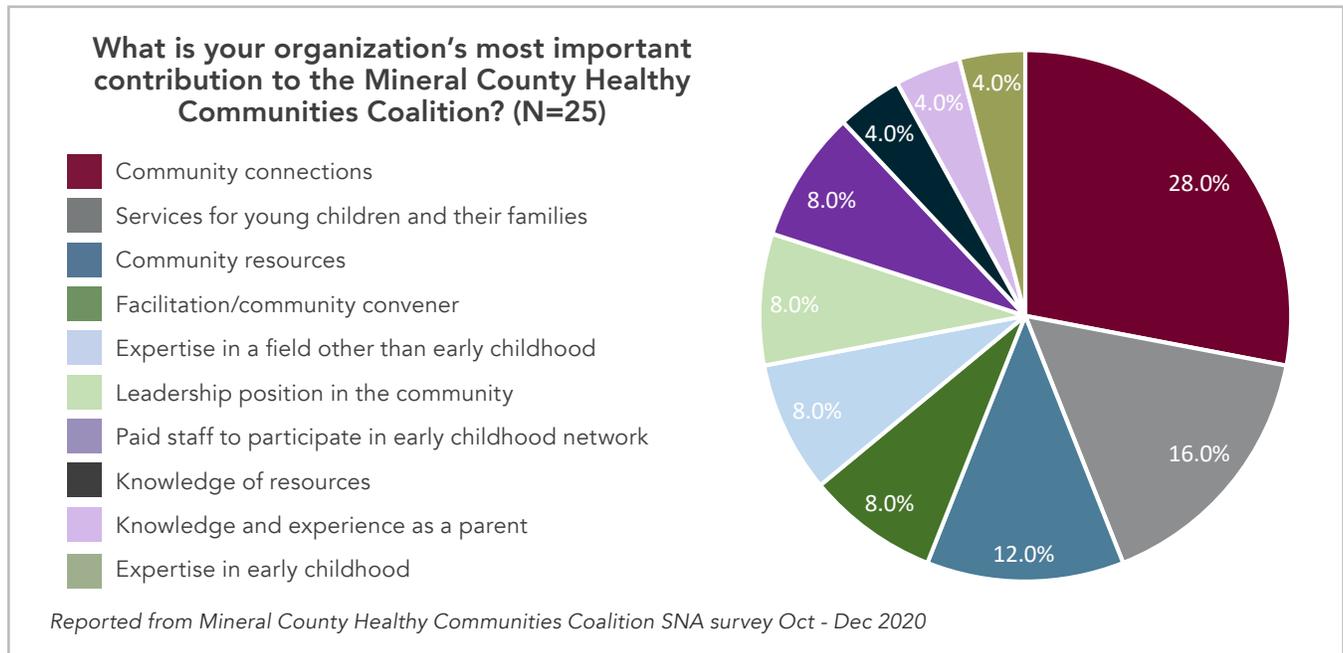
Reported from Mineral County Healthy Communities Coalition SNA survey Oct - Dec 2020

Resource Contribution

Network members reported the resources their organization contributes to the Collaborative. Respondents most frequently named community connections (84%), services for children and their families (64%), and knowledge of resources (60%). The resources that the fewest organizations can contribute include in-kind resources (8%) and public policy advocacy (8%).

Figure 8 illustrates the contributions that organizations reported to be the most important for the Collaborative; respondents named community connections (28%), services for young children and their families (16%), and community resources (12%) (Figure 8).

Figure 8. Most Important Contribution to the Mineral County Healthy Communities Coalition

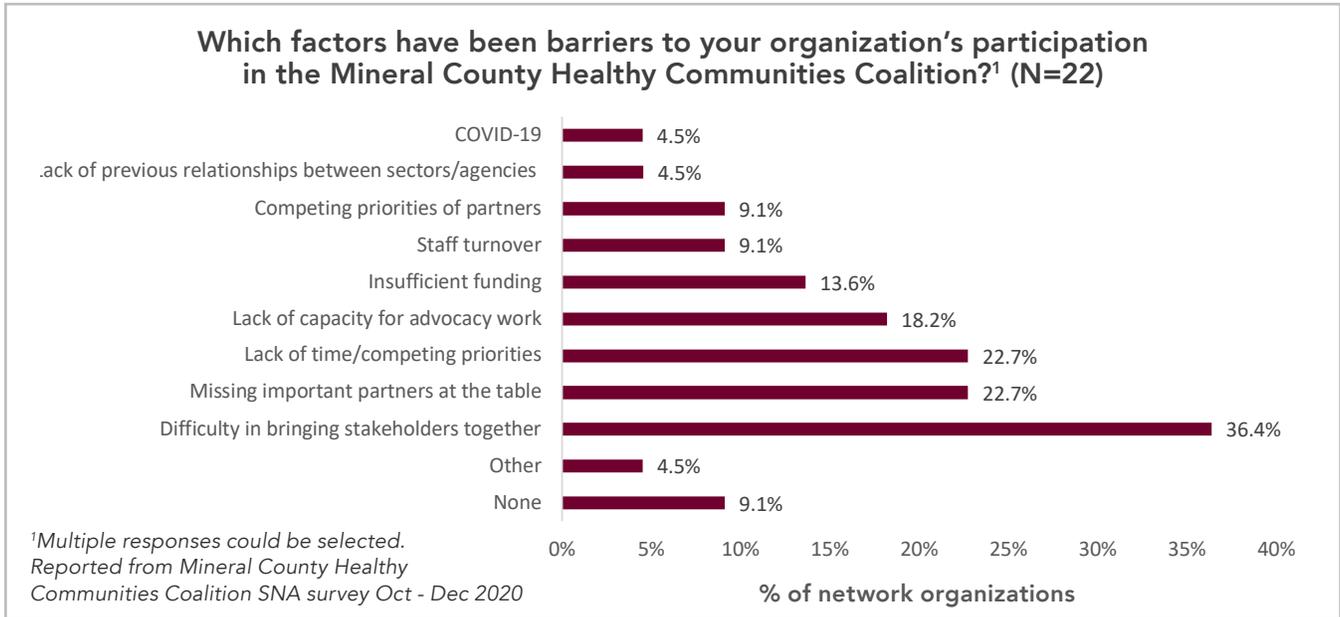


Facilitators and Barriers to Network Participation

Network members reported barriers to their organization's participation in the Coalition; a third of respondents (36%) reported that bringing stakeholders together presents the greatest barrier. Network members also reported missing important partners at the table (23%) and lack of time/competing priorities (23%) as barriers to participation (Figure 9).



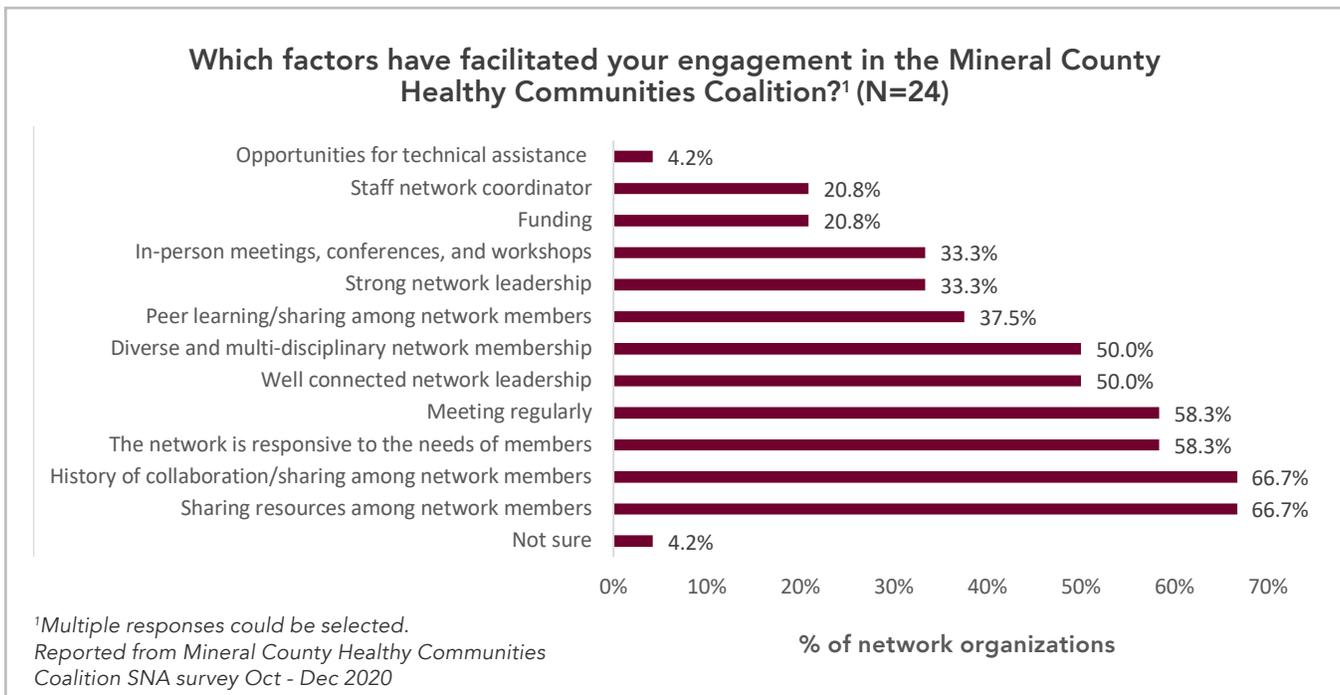
Figure 9. Barriers to Participation in Mineral County Healthy Communities Coalition



Network members reported factors that facilitate their organization's participation in the Coalition. Respondents named sharing resources among network members (67%), history of collaboration/sharing among network members (67%), the network is responsive to the needs of members (58%), and meeting regularly (58%) as the top facilitators (Figure 10).

"[The Coalition] has strength through diversity of participation, streamlining of multiple meetings into a focused, well organized and broad-based functional group, and the ability to broaden the reach of health and safety promotion in the community."
— Network Member

Figure 10. Facilitators to Participation in the Mineral County Healthy Communities Coalition

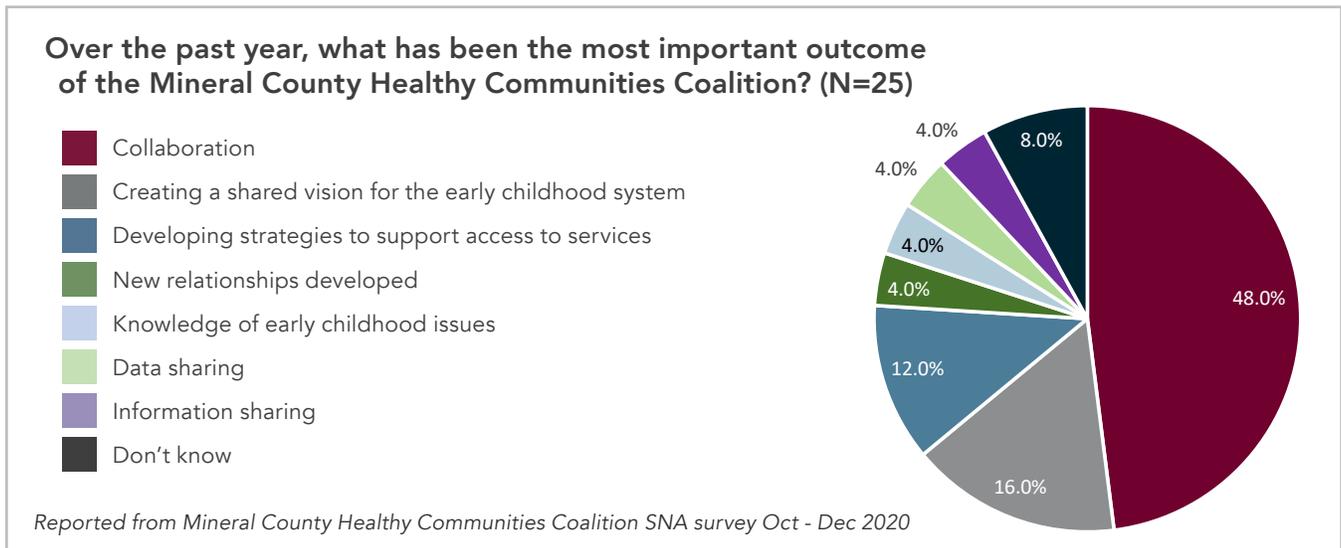


Outcomes of the Network

Network members reported the most important outcome from the Mineral County Healthy Communities Coalition in the past year. Respondents most frequently named collaboration (48%), creating a shared vision for the early childhood system (16%), developing strategies to support access to services (12%) (Figure 11).

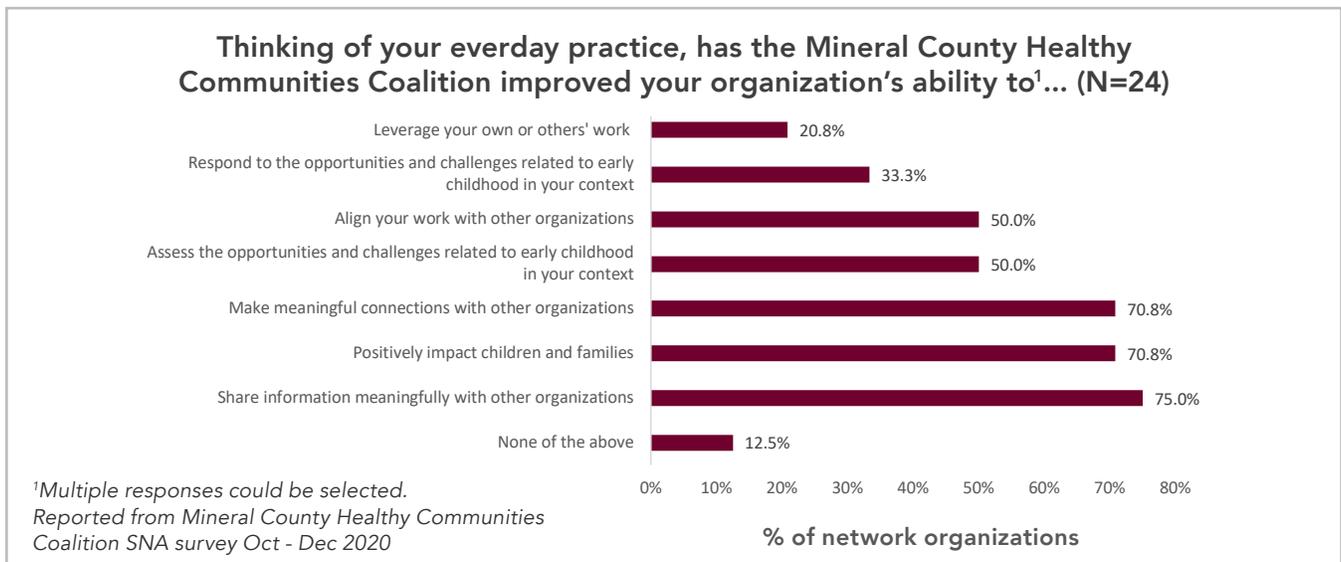
“HCC creates a safe, welcoming space for diverse community stakeholders to come together to share information, resources, and challenges. The meetings are structured and directed, goals are identified, and tasks assigned. HCC gets things done. It makes the best use of our time, resources, and experience to make our community strong. HCC meetings provide needed support and inspiration to isolated providers struggling to meet needs with few resources. It is a whole lotta fun, too. — Network Member

Figure 11. Outcomes of the Mineral County Healthy Communities Coalition



Network members reported that participation in the Collaborative helped their organization share information with other organizations (75%), make meaningful connections with other organizations (71%), and positively impact children and families (71%) (Figure 12).

Figure 12. Network Impact on the Mineral County Healthy Communities Coalition Members



Discussion

The Mineral County Healthy Communities Coalition has a history of collaboration across a wide range of health areas. Most members (64%) have been involved for over 2 years, with a quarter of relationships reported as integrated, the highest form of collaboration. As networks evolve, they often shift to a decentralized structure – where multiple organizations support the functioning of the network [4]. This structure contributes to sustainability as the density of connections and coordination of activities becomes shared across several organizations rather than maintained by one partner [9]. In the Mineral County Healthy Communities Coalition, several organizations have moderate degrees of centrality. The Health Department Grants Management program has the highest degree of centrality (61%), with the other Health Department programs also integrated in the network. In a network with such diverse membership and broad focus, we expect the level of engagement of partners to ebb and flow. When projects and initiatives align with an organization, involvement might increase, and when the focus areas are less relevant to day-to-day work the organization can shift to a less active role. The formation of focused subgroups like the Family Connections Collaborative, engages a set of partners to propel the work forward while maintaining ties to the greater network. This structure prevents overburdening partners in all activities while maintaining a link to their diverse perspectives and resources.

The overall network density score is low. This result likely reflects the Coalition's diverse composition of members, broad focus, and geographic distribution of partners. While breadth can lead to differing perspectives and contributions to a network, it can also create challenges in building close ties between partners with significant organizational differences [7]. The network has members from towns across the county and neighboring counties. The geographic distance between towns makes it difficult to build relationships across the network, likely contributing to the low density. Despite the overall low density, a group of organizations at the center of the network maintain a high density of connections. These organizations represent various sectors, including Health & Health Care, Education, Local Government, and Social Services. The rest of the organizations sit on the periphery of the network, with only a few ties to other partners.

We recommend Coalition leadership review the network map with particular attention to the organizations positioned on the periphery. These organizations might have important knowledge, resources, and services to benefit network activities. Strengthening their connections across the network builds cohesion and contributes to more efficient coordination and resource distribution [10]. For example, inviting a partner with limited ties to present about their organization to the Coalition. This gives network members a chance to learn more about this partner and creates opportunities for future collaboration. Another example involves connecting a local faith-based organization with a subgroup. The subgroup leader might not be aware of the social and environmental support the faith-based organization provides to families in the community. The faith-based organization has unique resources such as community space and volunteers that can support the activities of the subgroup. These connections provide network members with a purposeful way to participate and will contribute to increased density.

Conclusion

Visible Network Labs outlines four phases in the Lifecycle of a Sustainable Network [11]. Phase 1 and Phase 2 involve creating relationships and connecting members on the network's periphery. In Phase 3, the network creates more ties to tighten connections. In Phase 4, the network breaks into subgroups to support sustainable engagement over time [11]. The results of this SNA suggest that the Healthy Communities Coalition is in Phase 4 of network growth. The Coalition creates subgroups as necessary to support specific initiatives. The Family Connections Collaborative engages a set of partners to focus on early childhood. Increasing connections with organizations on the periphery of the network will enhance efficiency and resource distribution across the diverse set of partners. The dynamics of a network impact its overall effectiveness and ability to achieve desired outcomes [12]. The SNA has provided a baseline assessment of network characteristics for the Mineral County Healthy Communities Coalition. We recommend the continued collection of network data to understand the evolution and impact of these connections on the early childhood system in Mineral County.

Collaboration is an important prerequisite to community-level social change and ensuring that social service, health, education, and other service providers coordinate prevention services and cooperatively work toward the same goals. Montana's state and local systems of care are at varying stages of collaboration with many still competing against one another for limited funding, personnel, volunteers, space, and similar resources. The Zero to Five initiative encourages collaboration among local early childhood providers to promote positive change and improve the identification and sharing of limited resources. By creating more collaborative and efficient local early childhood infrastructures with less competition and more collaboration, communities can improve their capacity to reduce many common social determinants of health.

References

1. Varda DM. PARTNER (Program to Analyze Record and Track Networks to Enhance Relationships) Tool. Visible Network Labs
2. Varda DM, Chandra A, Stern SA, Lurie N. Core dimensions of connectivity in public health collaboratives. *J Public Health Manag Pract* 2008;**14**(5):E1-7 doi: 10.1097/01.PHH.0000333889.60517.46.
3. Provan KG, Nakama L, Veazie MA, Teufel-Shone NI, Huddleston C. Building community capacity around chronic disease services through a collaborative interorganizational network. *Health Educ Behav* 2003;**30**(6):646-62 doi: 10.1177/1090198103255366.
4. Varda DM. Data-driven management strategies in public health collaboratives. *J Public Health Manag Pract* 2011;**17**(2):122-32 doi: 10.1097/PHH.0b013e3181ede995.
5. Headwaters Foundation. Zero to Five. <https://www.headwatersmt.org/funding/strategic-initiative/zero-to-five/>.
6. Provan KG, Veazie MA, Staten LK, Teufel-Shone NI. The Use of Network Analysis to Strengthen Community Partnerships. *Public administration review* 2005;**65**(5):603-13 doi: 10.1111/j.1540-6210.2005.00487.x.
7. Retrum JH, Chapman CL, Varda DM. Implications of network structure on public health collaboratives. *Health Educ Behav* 2013;**40**(1 Suppl):13S-23S doi: 10.1177/1090198113492759.
8. Petrescu-Prahova M, Belza B, Leith K, Allen P, Coe NB, Anderson LA. Using Social Network Analysis to Assess Mentorship and Collaboration in a Public Health Network. *Prev Chronic Dis* 2015;**12**:E130 doi: 10.5888/pcd12.150103.
9. Luque J, Tyson DM, Lee JH, et al. Using Social Network Analysis to Evaluate Community Capacity Building of a Regional Community Cancer Network. *J Community Psychol* 2010;**38**(5):656-68 doi: 10.1002/jcop.20386.
10. Radcliff E, Hale N, Browder J, Cartledge C. Building Community Partnerships: Using Social Network Analysis to Strengthen Service Networks Supporting a South Carolina Program for Pregnant and Parenting Teens. *J Community Health* 2018;**43**(2):273-79 doi: 10.1007/s10900-017-0417-5.
11. Visible Network Labs. The Lifecycle of a Sustainable Network. <https://visiblenetworklabs.com/2019/10/25/the-lifecycle-of-a-sustainable-network/>.
12. Butterfoss F, Goodman R, Wandersman A. Community coalitions for prevention and health promotion: Factors predicting satisfaction, participation, and planning. *Health Education Quarterly* 1996;**23**(1):65 doi: 10.1177/109019819602300105.

Appendix A

Methodology

Instrument

The research team adapted the PARTNER validated tool for this study. The PARTNER tool is designed for public health Collaboratives and collects information on the quantity and quality of partnerships and non-relational questions about overall network functioning [2].

Participants

The research team conducted a whole network study that collected information from all members of the Zero to Five Collaborative. The Local Collaborative Coordinator provided the research team with a list of Collaborative members. Organizations with multiple Collaborative members chose one person to represent the organization, or the research team broke out the organization by programs. The representative answering the survey responded on behalf of their organization or program, not as an individual. The research team sent parents and community members a separate survey through Qualtrics that did not include the relational questions to maintain confidentiality.

Survey Administration

The research team distributed the survey from October 19, 2020 to December 4, 2020 through the PARTNER platform and Qualtrics. The first page of the survey obtained informed consent. The survey remained open for six weeks, and participants received email reminders weekly. Mid-way through the recruitment period, the research team mailed a letter and called participants that had not completed the survey. This study received approval from the University of Montana Institutional Review Board.

Data Analysis

The research team utilized the PARTNER platform to conduct descriptive analyses, including visual maps of the network. The research team considered a relationship to be present if one of the network members reported it as present. This allowed us to capture some data about network members who did not respond or provided incomplete data using other network members' answers.

Limitations

The surveys were completed by one person on behalf of an organization and might not represent the organization. The response rate was 71%, with some partial responses. SNA surveys are long, especially for organizations with many partners, which can contribute to survey fatigue. Missing data impacts the network measures and does not represent the complete network. The research team administered the survey during the COVID-19 pandemic and in the final months of the 2020 United States election. Agencies involved in public health collaboratives are often a part of the COVID-19 response in their communities. Elections bring an increase in email, mail, and phone calls to individuals. These two factors might have impacted the survey response rate.

Appendix B

Glossary

Attribution: the proportion of all relationships attributed to the Zero to Five Collaborative.

Breadth: the proportion of different types of organizations that are members of the network.

Business: organized efforts and activities to produce and sell goods and services for profit.

Cooperative Relationship Activities: involve exchanging information, attending meetings together, and offering resources to partners.

Coordinated Relationship Activities: include cooperative activities in addition to intentional efforts to enhance each other's capacity for the mutual benefit of programs.

Degree of Centrality: the number of connections an organization has to others as a proportion of all possible connections.

Density: the number of relationships reported as a fraction of the total number of possible relationships across the entire network.

Education: provide systematic instruction, including at a preschool, school, or university.

Faith-Based Organization: an organization that is based in a particular faith.

Government: governing body of a community or state.

Health & Health Care: promotes and protects the health of people and the communities and the organized provision of medical care (including mental health care) to individuals or a community.

Integrated Relationship Activities: in addition to cooperative and coordinated activities, this is the act of using commonalities to create a unified center of knowledge and programming that supports work in related content areas.

Level of Collaboration: the proportion of all relationships reported as cooperative, coordinated, and integrated.

Parent / Community Member: network members that are not affiliated with an organization.

Partnership: a member had worked with another organization on an early childhood project in the last year.

Social Network Analysis: a research methodology that measures how organizations participate in a network and the quantity and quality of relationships between partners.

Social Services: services to promote social well-being including financial support, job training, child care, and public assistance.

Value: the average of all members' ratings on their partners value to the network in three areas level of power and influence, level of involvement, and resource contribution (all items were rated on a scale of 1 "not at all" to 4 "a great deal").