

The Integration of Mental Health and Social Care Services in Emergency Situations. The Case of the 2016 Earthquake in the Marche Region

By Sabrina Moretti, Francesco Sacchetti[±] & Pietro Serafini[°]*

In the field of healthcare, the tendency to seek organizational models based on the integration of all social and healthcare services emerges, as demonstrated by the WHO guidelines. In the Italian healthcare system, this has led to the creation of local integration systems that involve the definition of protocols and formal relationships between centers that provide social and healthcare services. Catastrophic events, such as earthquakes or floods, cause rapid and unexpected changes that undermine the planned structure of the inter-organizational structure. Existing network configurations must quickly adapt to the new situation. Our work presents the results of a study involving ASUR (Azienda Sanitaria Unica Regionale) Marche in the province of Ascoli Piceno, which was hit by the 2016 earthquake, and the University of Urbino Carlo Bo, aimed at studying the evolution of the structure of the inter-organisational network linking the centres involved in providing social welfare services in the field of mental health, as a consequence of the seismic event.

Keywords: *Mental health services, social care integration, Emergency response, Social Network Analysis (SNA), Disaster resilience, Italian healthcare system*

Introduction

The ability to realize specific objectives for complex organizations, such as social and healthcare centers, relies on the collaboration and coordination of a certain number of subjects and units that differ in their cognitive orientations, the knowledge and languages they use, their technical specializations, and the values that guide their actions (Shortell & Kaluzny 2000). In the specific case of mental health, there is a need to provide a wide range of social and healthcare services, with specialized centers delivering both residential and outpatient treatment, with continuity.

To monitor the level of integration of social and health care and ensure the high performance of service provision, it is essential to study the relationships between the different actors, especially since they can become critical due to the intensity and complexity of interdependencies. As such, the study of the relational structure can become an advantageous tool, enabling the identification of those coordination mechanisms established at an operational level that have not been designed or foreseen. Detecting these mechanisms can help to develop a greater awareness of the characteristics of cooperation between social actors (Clemente 2013).

*Associate Professor, University of Urbino, Italy.

[±]Associate Professor, University of Urbino, Italy.

[°]Data Analyst, AST Ancona, Italy.

The relational approach, based mainly on Social Network Analysis (SNA), allows us to focus on the structure of the emergent links between the various actors involved in organizational action. Studies that follow this approach draw on the assumption that the behavior of actors also depends on the opportunities and constraints made available by the structure of relationships (Freeman 1979, Granovetter 1985). SNA can help detect changes in the structure of interorganizational networks that occur due to unexpected events.

What happens when an unexpected, catastrophic event occurs? Organizations must redefine their roles within interorganizational systems, renegotiating collaborations in a context that changes suddenly and unexpectedly. Sudden, unanticipated changes triggered by the disastrous event can undermine the planned structure of interorganizational relationships. Existing network configurations must quickly adapt to this new situation. Consequently, there is a need to engage in unplanned actions and rethink how the network is managed. The groups of centers that must respond to the emergency are not established in advance, but are formed rapidly, according to the experiences that develop in the first moments of the event (Denning 2006).

Starting from these premises, this article seeks to answer related questions. How does the structure of relationships change immediately after a catastrophe (here we refer to a seismic event)? What happens when the emergency phase ends? Is the structure of relationships maintained, or does it return to the pre-emergency configuration? Which conditions determine greater resilience for service delivery centers?

To answer these questions, this study focuses on the interorganizational network of centers providing social and mental health welfare services in the province of Ascoli Piceno, in the Marche region of Italy. Specifically, we examine changes in the structure of this network after a destructive earthquake hit the province in 2016.

Literature Review

The literature contains several uses of SNA to study mental health and social organizational network structures (Kapucu & Demiroz 2017). In these applications, we find some approaches that interpret the concept of network integration differently. The operationalization methods of SNA depend on contextual factors, including the nature of the centers involved and the specific objectives of the respective analyses, making it difficult to find a shared and standardizable solution.

For this reason, various solutions have been proposed in mental health services to address the challenge of “measuring” the extent of network integration.

First, the conceptual meaning of network integration is based on dyadic integration, that is, the degree of connection between two organizations. In our case, this is measurable in terms of the intensity of exchanging patients, information, and resources. The greater the number of exchanges, both in frequency and type, the better the level of integration (Raeymaeckers & Kenis 2015, Pomare et al. 2018).

Network integration is determined by a comprehensive view of all dyadic relationships (Provan & Lemaire 2012, Altalib et al. 2019). For this reason, the first indicator that is considered to understand integration is “density”, which is based on

the proportion of existing ties compared to all possible ones (Provan & Sebastian 1998). At the same time, it has been demonstrated that the ability to ensure the effectiveness of collaboration between nodes that provide complementary and necessary services, avoiding the dispersion of energy and resources, requires centralized coordination (Raeymaeckers & Kenis 2015). According to Provan and Kenis (2008), however, if the number of nodes is high, it is difficult – if not impossible – to adopt a form of shared governance; as such, the need emerges to have one or more centers that can coordinate activities. Networks should therefore be “centralized”. For this reason, network integration has come to be evaluated by considering both the level of interconnection between organizations and the extent to which they are integrated and coordinated through a central authority (Morrissey et al. 1994). In addition to density measurement, it is therefore necessary to calculate the values of network centralization and node centrality (Freeman 1979).

Nevertheless, in the social and health care systems domain, many organizations have different organizational cultures (Tomelleri & Lusardi 2017), creating great difficulty in administering and coordinating them through a single center. These systems consist of groups of homophilous organizations that share objectives, values, work practices, and skills. Moreover, node differentiation is important in social and health care systems, as it allows users to receive various, complementary services. Consequently, however, a conflict can emerge between the goals of full care coverage, which would require node differentiation, and care integration, which would require coordination (Nicaise 2013). High differentiation is usually accompanied by low centralization, as it is challenging to coordinate centrally activities that span different organizational cultures (Bazzoli et al. 1998). For this reason, integrating services can be a priority, which relies on understanding the level of connection between heterophile groups. Thus, the problem of how to identify groups arises. Scholars have adopted two strategies. The first one identifies each group by exploring relational characteristics, applying methods based on SNA, such as the classification and analysis of overlapping cliques (Provan & Sebastian 1998) and the detection of structurally equivalent positions (Morrissey et al. 1994, Davis et al. 2012).

The second strategy identifies groups through a “reasoned choice”, creating classes of nodes based on individual organizations’ attributes, especially those attributes that distinguish the different types of service provided (Lorant et al. 2017, Nicaise et al. 2013). We can essentially label this process as “qualitative”, since the definition of equivalent groups is based on a series of information collected through documents and discursive interviews.

SNA has also been applied to disaster studies (Varda et al. 2009), particularly to evaluate the efficiency of interorganizational communication during and after catastrophic events (Tierney 2019, Perrow 1999, Kapucu 2006, Robinson et al. 2006, Comfort & Haase 2006). Sociological research has mainly focused on the dynamics of the social networks mobilized to provide relief and assistance to populations affected by disasters (Varda et al. 2009). Still, no studies analyze the disruptions a disaster can cause in formalized and pre-existing interorganizational networks.

The study of the evolution of the interorganizational health-care system in Ascoli Piceno aims to contribute to expanding knowledge of the transformation

processes of interorganizational networks by seeking to understand how these networks react to unexpected events and what conditions favor or inhibit health-care integration.

The Social and Mental Health System of Ascoli Piceno

This article aims to analyze the impact a disastrous event, such as an earthquake, has had on an interorganizational network providing social and mental health services. It does so by comparing the network's social and healthcare integration level between: 1. the pre-earthquake period, 2. the emergency period, immediately following the earthquake, and 3. the period after the emergency. We aim to help increase understanding of the transformation processes of interorganizational networks by exploring how these networks react to unexpected events and identifying the conditions that favor or inhibit integration.

The results may help comprehend the processes regulating the relationship between structure and agency by investigating how institutional pressures, contingent conditions, and the reactions of social actors develop and interact.

Social and healthcare services in mental health are provided by the Healthcare System, which is both public and private, and by territorial administrative social institutions called Social Territorial Areas (ATS, acronym of *Ambiti Territoriali Sociali*). ATSs are part of local Municipalities. The public healthcare service is divided into two distinct organizational nuclei, each of which has several centers: the Department of Mental Health (DSM, acronym of *Dipartimento di Salute Mentale*) and the Complex Tutelary Care Unit (UCCT, acronym of *Unità Complessa Cure Tutelari*). Both are divided into two territorial districts: the coastal one and the inland one.

The DSM provides all services relating to diagnosing and treating mental illnesses, including hospital and community services. Each district is coordinated by a unit called the Mental Health Center (CSM, acronym of *Centro di Salute Mentale*).

The centers that are part of the UCCT provide rehabilitation services for individuals with mental health impairments, as well as social, professional, and scholastic integration.

In addition to these two groups, four ATSs are responsible for planning and coordinating social services. The ATSs have much less homogeneous organizational structures than the health centers, without central coordination, as they belong to different municipalities.

Between 24 August and 31 October 2016, a series of seismic shocks hit a part of the province of Ascoli Piceno, particularly the predominantly mountainous internal area, spanning a terrain of approximately 25,000 residents. Many buildings were damaged, causing part of the population to move towards the coastal area. The earthquake hit the inland health district and three ATSs. Some centers were forced to move to other buildings, due to the damage caused by the earthquake, though they continued their activity.

Following the 2016 seismic event, a temporary operational unit was set up to deal with the emergency, named "Equipe sisma" (earthquake team). It was active from March 2017 until February 2018. The personnel of the Equipe combined units

of staff from the DSM and the UCCT, with the addition of five units of fixed-term staff, who finished their service when the team disbanded.

Methods

This study compares the network structures configured in three-time intervals: 2015, 2017, and 2019. These correspond respectively to the period before the earthquake, the period immediately after the quake, and the period after the emergency. This comparative study uses the tools of Social Network Analysis (SNA). SNA allows us to represent an interorganizational network through a graph, a mathematical object composed of nodes connected by lines, called “edges”. In this study, the nodes represent the centers that provide social and healthcare services in mental health.

Nodes Identification

The centers were identified based on data provided by the Psychiatric Services Information System (SISP) database. This database contains coded units corresponding to the various centers belonging to the DSM or to private structures affiliated with the public health system, which offer residential services for people with mental disorders. Subsequently, other centers providing mental health and social services were added: the UCCT centers, the four ATs of the province of Ascoli Piceno, and two centers that deal with pathological addictions that are part of the public health system. Furthermore, from interviews with the center managers, three other private affiliated centers were identified that collaborate mainly with the UCCT. Overall, this resulted in 43 centers, which constitute the network nodes.

Ties Operationalization

Subsequently, we defined two types of interorganizational tie, which connect the various centers, based on the studies found in literature (Lorant et al. 2017, Nicaise et al. 2013, Davis et al. 2012, Lemieux et al. 2005, Altalib et al. 2019, Pomare et al. 2018):

- 1) sending and/or receiving referrals;
- 2) participation in regular meetings between the staff working in the centers.

To operationalize the first type of tie, data from the SISP database were used. These data records all the services provided by the centers belonging to the DSM and affiliated private centers. A tie is recorded between two centers if they have provided services to the same patient. To identify user referrals involving the centers that do not appear in the SISP, semi-structured interviews were carried out with the heads of the centers of the DSM, UCCT, and ATs, in which they were asked to indicate the centers with which they shared patients. When discrepancies emerged, the study integrated archive data, which was considered more reliable than the interviews.

Data used to operationalize the second type of tie – i.e., those concerning participation in regular meetings – was collected exclusively through interviews with the managers of the centers, who were asked: 1) for a list of centers with which they meet regularly; 2) how long meetings lasted, on average; and 3) the number of meetings in a year. Only ties declared by both nodes were included (see Morrissey et al. 1997, Nicaise et al. 2013). A weight was attributed to each tie, represented by the number of annual meetings estimated by the interviewees. When these estimates did not coincide, an average of the two was recorded.

Network Construction

The data collected refers to the years 2015, 2017, and 2019. To evaluate the level of network integration and any variations caused by the earthquake emergency (and in its wake), a multiplex network was analyzed, formed by multiple links. For this network, an edge was added to two nodes only if they were linked both by the exchange of users and by the presence of regular meetings. The multiplex link reflects a greater commitment between the structures – an effective collaboration and sharing of activities – therefore, it can be used to quantify the level of integration. Indeed, a mere referral from a center may not represent a meaningful inter-agency relationship; this may also indicate a lack of coordination between the agencies involved or an uncoordinated care approach, also known as “dumping.” Combining referral data with information on regular meetings defines stronger relationships, therefore implying a greater commitment to the working relationship and concrete collaboration between the different centers (Morrissey et al. 1997, Provan & Mildraw 2001, Nicaise et al. 2013, Lorant et al. 2017).

Interviews

In order to understand how social actors react to sudden changes and how their actions contribute to the development of network structures, qualitative interviews were conducted with the managers of the various centers, asking how they experienced and reacted to the dramatic events of the earthquake (Fuhse & Mützel 2011).

A total of 17 interviews were conducted. Each subject was asked to fill out – in dialogue with the interviewer – two relational questionnaires: one on taking charge and one on regular scheduled meetings. Each questionnaire collected information for the years 2015, 2017, and 2019, as previously specified. At the end of the questionnaire, a semi-structured interview was carried out with respondents, enabling greater detail on certain relational aspects and clarity regarding the organization’s context during the emergency. These interviews allowed us to gain a deeper understanding of the collaborative dynamics between the centers and enrich the structural analysis of the multiplex network, offering contextual information that would not have been easily captured with purely quantitative methods.

Interviewees described how the crisis accelerated or hindered cooperation, leading to new strategic alliances or highlighting pre-existing weaknesses in the support system. This allowed us to identify the evolutionary trajectories of the

network in the pre-earthquake, emergency, and post-emergency periods, providing a dynamic perspective on the processes of institutional integration and adaptation.

Finally, the qualitative data collected through the semi-structured interviews triangulated the quantitative results, contributing to a more solid interpretation of interorganizational relationships. This approach helped validate the information from the questionnaires, identifying potential discrepancies and offering a more complete view of the interactions between the centers.

Results

To evaluate the network's integration level and any variations before and after the earthquake, the multiplex network was analyzed – that is, the network formed by multiple ties. As mentioned above, for each pair of nodes, a link was added only if they are connected by user referrals and regular meetings (Figures 1, 2, and 3). The weight of each edge is determined by the number of meetings held in a year. It is assumed that the strength of the relationships is determined by the frequency of meetings – which increases in mutual knowledge and trust – rather than by the referral and exchange of patients.

From the comparison of the multiplex networks, no major differences emerged between the three years. The most marked difference concerns the value of the weighted average degree¹, but it does not appear to be statistically significant (Table 1).

Table 1. *Multiplex Network. Values calculated with Gephi Software*

	2015	2017	2019
Density	0,107	0,107	0,110
Weighted average degree	83,256	85,349	88,093
Number of edges	97	97	99

¹The weighted degree of a node is the sum of the weights of the edges incident with the node (Zhang et al. 2000).

Figure 1. *Multiplex Graph, Year 2015, processed with Gephi Software. The Value of the weighted Degree Determines the Size of the Nodes*

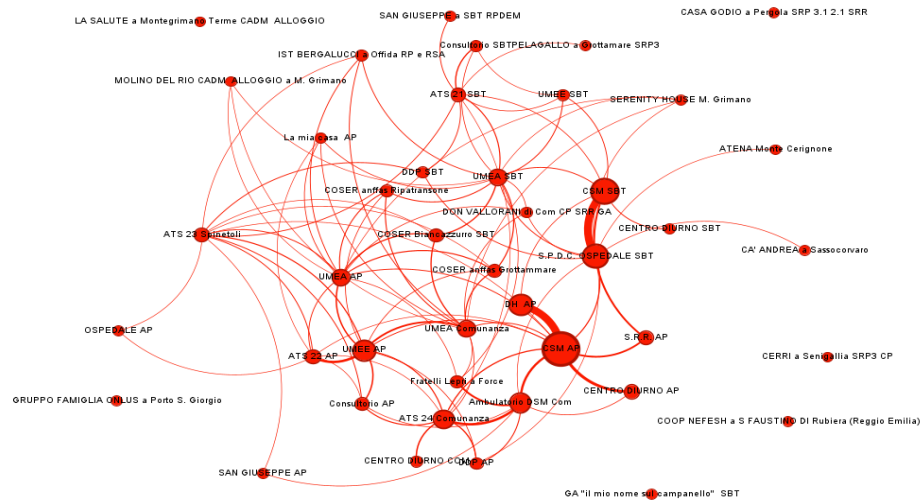


Figure 2. *Multiplex Graph, Year 2017, processed with Gephi Software. The Value of the weighted Degree Determines the Size of the Nodes*

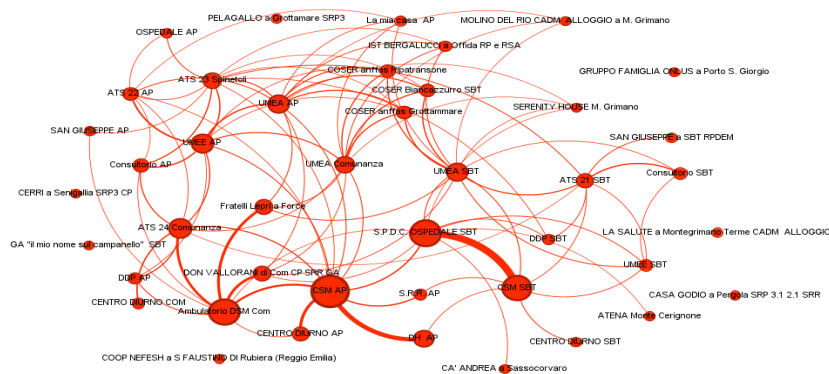
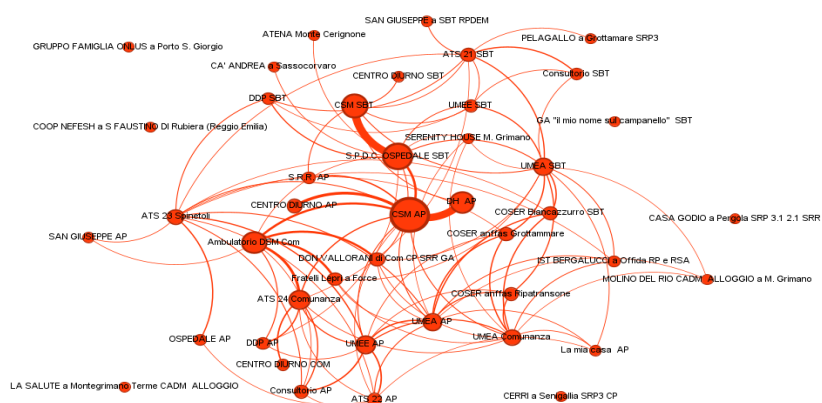


Figure 3. *Multiplex Graph, Year 2019, processed with Gephi Software. The Value of the weighted Degree Determines the Size of the Nodes*



To detect the degree of social and healthcare integration, the study adopted the strategy used by Nicaise et al. (2013), based on evaluating connections between groups of homophilous organizations. In particular, the relationship between the cohesion and internal centralization of each group, as well as the inter-group density, was analyzed, since the degree of integration depends on the level of connection between internally centralized heterogeneous groups.

From this analysis, it is possible to identify three main groups of centers that offer services for people with mental health problems. The first group includes the DSM facilities, which offer all services related to the diagnosis and treatment of mental illnesses.

The second group comprises the centers of the UCCT, which provide services for the rehabilitation and social and scholastic integration of patients who have been in difficulty and/or have disabilities. Like the DSM, it is a part of the health system, but it is aimed at a more varied user base: not only those with psychiatric problems, but all those people who live with forms of disability.

Finally, the third group comprises ATs, organizational articulations belonging to territorial authorities, generally associations of municipalities, which plan and coordinate social services. The four ATs in the Ascoli Piceno province have organizational structures that are much less homogeneous than the centers of the health system: they do not have central coordination, as they belong to different bodies.

The DSM Network

The DSM network comprises a central nucleus of centers belonging to the public health system and seventeen private residential centers that accept patients with mental health problems, some of which are located outside of the province of Ascoli Piceno, and, in one case, even outside the Marche region. The private centers constitute the network's periphery, and many do not have strong ties with the other nodes, that is characterized by both the exchange of patients and regular meetings between the staff. Most of these accept patients but do not regularly interact with the public health service's centers. This situation has remained constant for all three years. In total, the nodes of the network are 29.

The centralization value² is relatively high, both in 2015 (0.31) and in 2019 (0.32), while it decreases in 2017 (0.21): this means that there is centralized coordination concerning shared activities, while this weakens in the emergency period. In the latter, there is a slightly more marked tendency to establish direct relationships between the centers, with less mediation by the coordinating nodes. The most central nodes, with the largest numbers of connections, are the two Mental Health Centers (CSM) and the hospital center (SPDC, acronym of Servizio Psichiatrico di Diagnosi e Cura) (Table 2). The two CSMs constitute the two territorial coordination points, as they have strong links with the centers located in their territorial area: the CSM of Ascoli Piceno with the centers located in Ascoli Piceno and the CSM of San Benedetto del Tronto with the centers located in the coastal area. The value of the simple degree of the SPDC is higher than the values of the

²The centralization index describes the extent to which a network's cohesion is organized around particular focal points (Scott, 2000).

two CSMs, while that of the weighted degree is lower. This means that it has less regular but more widespread relations, which is doubtless also tied to the fact that it is the only hospital facility in the entire province.

Table 2. *Centrality Values of the DSM Network Nodes, calculated with the UCINET Software*

	2015			2017			2019		
Struttura	Simple degree	Weighted degree	Normalized degree	Simple degree	Weighted degree	Normalized degree	Simple degree	Weighted degree	Normalized degree
CSM AP	5	460	35,39	5	355	27,31	5	485	37,31
CSM SBT	4	312	24	4	277	21,31	4	282	21,69
S.P.D.C. OSPEDALE SBT	7	283	21,77	7	294	22,62	7	332	25,54

The UCCT Network

The UCCT network is made up of a total of 10 centers, which are part of the complex network including three UMEA (Multidisciplinary Unit for Adulthood, acronym of Unità Multidisciplinare Età Adulta) centers – located in San Benedetto del Tronto, Ascoli Piceno and Comunanza – two UMEE (Multidisciplinary Unit for Children, acronym of Unità Multidisciplinare Età) centers, two clinics in Ascoli Piceno and San Benedetto del Tronto, and three private centers that are affiliated with the National Association of Families and People with Cognitive Disabilities and Neurodevelopmental Disorders (ANFASS). The density value of the UCCT network equates to 0.45, which remains constant over time. This network is smaller than the DSM network. A high density corresponds to a modest centralization (0.15 in 2015, 0.14 in 2017, and 0.14 in 2019). These values depend on the fact that the number of nodes is small and that there are direct links between the centers in the same territorial area.

The ATS network

The ATS network – responsible for managing social interventions in the territory – has a very different configuration from the health service networks, consisting of merely four nodes. First of all, it can be observed that the centralization values are close to 0 in all the periods considered (0.06 in 2015, 0.05 in 2017, and 0.012 in 2019). This is down to the lack of a coordination framework, since each has its own organizational structure connected to the local authority to which it belongs. There is, therefore, a certain level of heterogeneity concerning organizational management.

Intra- and Inter-cluster Density

As seen above, the ability to integrate services can be evaluated by quantifying the level of connection between heterogeneous groups concerning the nature of services offered and the broader organizational culture. To achieve this, it is important to analyze the relationship between the density within the groups and the density between them. The groups that we consider homogeneous are those of the DSM, the UCCT, and the ATSS. The nodes that represent private structures were not considered in this analysis, both because they are characterized by a different organizational culture concerning public structures and because they are located on the network's periphery.

As mentioned, the level of integration is understood as the capacity for inter-group connection, especially between healthcare services and social assistance. For this purpose, the relationship between internal group density³ – measured by calculating the weighted average of networks – and the density *between* groups – measured through the “density by group” function provided by UCINET – is taken as an indicator of integration. The results of this calculation are presented in Table 3 (Nicaise et al. 2013).

Table 3. *Multiplex Network. Values calculated with UCINET*

	Intra-cluster density- Average tie strength		
Structures	2015	2017	2019
DSM group	71	58,18	77
UCCT group	20,83	17,17	18,3
ATS group	6,25	6,25	3,75

	Inter-cluster density - Average tie strength		
Structures	2015	2017	2019
DSM - UCCT	10,43	10,5	10,5
DSM - ATS	17,25	19,63	21,25
UCCT - ATS	18,33	19	15,92

The data shows that the ATSS have a much lower internal density than the inter-group density, while, on the contrary, the DSM has a much higher intra-group density. This makes it evident that the ATSS do not constitute a homogeneous group; each node has specific organizational practices and rules linked to the local context, and it is autonomous from the other ATSS from a management point of view, as there is no coordination center.

From a longitudinal perspective, what emerges is that, between 2015 and 2017, the internal density of both the DSM and the UCCT groups decreases. The relationship between the DSM and the UCCT remains constant over the three years considered, while the relationship between the DSM and the ATSS strengthens in

³The “inter-cluster density” calculates the density between two groups by dividing the total number of ties between the groups by the maximum possible number of ties.

2017 and again in 2019, and the one between the UCCT and the ATSS is consolidated in 2017, but it subsequently weakens in 2019.

In conclusion, in the period immediately following the earthquake, the relationships between the centers of the healthcare and social welfare systems intensify and become more widespread. This intensity was consolidated between the DSM and the ATSS in 2019, while it significantly decreased between UCCT and ATSSs.

Suppose we verify the role of each node within the network by analyzing the centrality values of the most active nodes (Table 4). In that case, it becomes evident that, on average, betweenness⁴ decreases in 2017 because the relationships are more widespread.

Table 4. *Multiplex Network. Values calculated with Gephi Software*

	Normalized Betweenness			Weighted degree				
Structures	2015	2017	2019	2015	2017	2019	Increase 2017 from 2015	Increase 2019 from 2015
S.P.D.C.SBT	12,50%	11,70%	12,60%	305	325	378	6,56%	23,93%
ATS 21 SBT	12,80%	8,70%	12,00%	87	100	86	14,94%	-1,15%
UMEA SBT	13,60%	11,70%	12,70%	145	169	166	16,55%	14,48%
ATS 23 Spinetoli	12,50%	11,70%	12,60%	90	123	119	36,67%	32,22%
Comunanza DSM clinic	4,10%	5,60%	3,60%	209	320	275	53,11%	31,58%
UMEA AP	5,50%	5,40%	5,40%	150	180	163	20,00%	8,67%
CSM AP	9,90%	10,10%	11,20%	524	428	559	-18,32%	6,68%
CSM SBT	7,30%	6,40%	6,90%	340	304	308	-10,59%	-9,41%
ATS22	2,30%	2,28%	2,29%	101	77	59	-23,76%	-41,58%
ATS24	7,64%	7,02%	7,36%	197	199	199	1,02%	1,02%

The analysis of the nodes' weighted degree highlights a general increase in 2017, with the notable exception of the two CSMs, which instead likely lost their coordination function during the crisis. A significant increase in both weighted degree and betweenness is recorded for the Comunanza clinic. This small center, which has very few staff units and is located in a mountainous and marginal area of the province, adopted a "bridging" role during the emergency, which it then partly subsequently afterwards, in 2019.

The CSM in Ascoli Piceno decreased contact with the other centers during the emergency. This perhaps depended on the fact that, in 2015 and 2019, the CSM coordinated the DSM centers: as a result, the relationships within the DSM were enacted through the CSM. This function was partly lost during the emergency phase, when interactions developed more directly. The interviews revealed a temporary

⁴Betweenness expresses the extent to which a node is "between" the various other nodes in the graph: a node with high betweenness assumes the role of "intermediation" (Freeman, 1979).

operational unit, named “Equipe sisma” (earthquake team), was set up to deal with the emergency. It was active from March 2017 until February 2018. The personnel of the Equipe combined units of staff from the DSM and the UCCT, with the addition of five units of fixed-term staff, who finished their service when the team disbanded.

The differences observed could therefore be attributable, principally, to the organizational structure of the Equipe during and after the seismic event. This emergency team established situations managed simultaneously by DSM and UMEA personnel in the locations linked to earthquake response (morgues, collection centers, temporary structures for the displaced, etc.). In this context, prior bureaucratic rules that regulated interorganizational relationships under the coordination of central units were no longer followed, and this determined greater face-to-face interaction between all the operators belonging to the various DSM and UCCT centers.

«The working group was composed of colleagues from both facilities. Critical situations – for instance, relating to a lack of accommodation or deaths in the family – were also addressed thanks to the presence of personnel acquired through emergency funds allocated after the earthquake. During the emergency period, the presence of groups of colleagues collectively made it possible to address the needs of the patients in a more effective and targeted way [the personnel moved where necessary]; this arose in a contingent manner due to the precariousness of the situation created by the earthquake» (UMEA AP Manager).

The interviews also testify that, after the end of the emergency phase, the CSM in Ascoli Piceno interacted less frequently with other centers, especially with the UCCTs, despite their closer relationship before the earthquake. The head of the CSM of Ascoli Piceno observed a general decline in the mountain area hit by the earthquake, due to the transfer of patients towards the coastal area. Despite this, during the earthquake period, interactions with the UCCT centers remained constant, thanks to a compensation effect whereby the coastal centers also took care of patients from the mountain areas who had been forced to abandon their damaged or destroyed homes. In this sense, the organizational structure showed positive resilience, demonstrating its ability to offset the new emergency-specific configuration.

ATS 22 in Ascoli Piceno saw a decrease in the number and intensity of relationships immediately after the earthquake and even more so after the end of the emergency, in contrast to the general trend. This ATS includes the municipalities that were most directly affected by the earthquake. As a result, due to the disaster, they lost part of their functionality, leading to a reduction in activities and, consequently, in the number of their interorganizational relationships. However, even when the emergency phase ends, ATS 22 demonstrates a continued loss of part of its ability to connect with other centers, especially the UCCT with which it had a closer relationship before the earthquake.

On the contrary, ATS 23 in the town of Spinetoli increased its relational activity, mainly with the DSM.

The differences between the two ATSs could derive from their different approaches to staff management and greater organizational autonomy. Interviews revealed that Ascoli Piceno’s ATS has only two employees, the manager and an administrative assistant, while all social workers operate as precarious collaborators, making it challenging to coordinate the activities continuously. As several studies

have attested (Tomelleri & Lusardi 2017, Fazzi 2013, Ferrario 2009), the social worker often takes on the role of facilitator of exchanges in network dynamics.

Furthermore, all the municipalities covered by ATS 22 are located around the earthquake's epicenter, so its active offices were/are no longer operational, both during and after the seismic event, because of the significant impact of the disaster. As a result, while the health facility continued to have administrative responsibility for individual patients, the territorial one did not. When patients no longer reside in the territory of a specific municipality, their administrative management is transferred to the social workers of the municipality to which they have been moved. As a result of this process, relationships with other centers in the territory are lost or absorbed by other ATSS.

Discussion

Immediately after the earthquake, the DSM centers – which ordinarily cooperate through centralized coordination – changed their interorganizational behavior by adopting more broadly distributed collaborations. As such, central coordination became less pertinent. This allows the network to become more flexible and better adapt to situations that demand rapid change and adaptation (Comfort & Haase 2006). After the emergency phase, there is a tendency to return to the previous situation.

However, the analysis of the level of integration between mental healthcare and social welfare services shows divergent behaviors. In our case study, a good level of resilience was expressed by the DSM, which successfully compensated for the critical issues that emerged in the areas most affected by the earthquake, thanks to an organic coordination structure and the presence of multiple organizations throughout the territory that belong to a single organizational entity.

On the contrary, the ATS 22 of Ascoli Piceno, which is located in the worst-affected area, was not able to maintain the level of social and healthcare integration that it had before the emergency, since it lacked organizationally defined relationships with the ATSS of the neighboring areas, due to the more autonomous nature of these centers. In addition, it works with many precarious staff members, which impedes the establishment of continuous relationships with other centers.

This study reveals an apparent paradox: contrary to a significant body of literature that associates resilience with decentralized and flexible networks (Provan & Lemaire 2012, Turrini et al. 2010), the more centralized and formalized structures—particularly the Department of Mental Health (DSM)—appeared to respond more effectively to the emergency. These organizations were able to compensate for local disruptions, maintain administrative control over patient pathways, and rapidly integrate temporary actors through the creation of the *Equipe sisma*. This finding challenges the assumption that decentralization is inherently more adaptable in crises.

One possible explanation is that the DSM's pre-existing formal structures offered coordination and institutional redundancy, allowing services to be rerouted without disrupting patient care. This form of resilience is consistent with what Comfort & Haase (2006) describe as “structured adaptability”: the ability to flex within a clear organizational framework. In contrast, the ATSS - which lacked

centralized governance and relied heavily on precarious staffing arrangements - struggled to maintain continuity, particularly in the areas hardest hit by the earthquake.

The precarity of ATS staffing had tangible effects on coordination. With many social workers employed on short-term contracts or as external collaborators, there was little institutional memory, weak relational continuity, and limited capacity to engage in sustained interorganizational efforts. This instability not only hindered collaborative planning but likely weakened the ability of the ATSs to respond equitably and promptly to the needs of displaced populations.

Situating our results in the broader literature on resilience and interorganizational coordination, we suggest that the binary distinction between centralized and decentralized governance is overly simplistic. Recent scholarship in disaster governance argues (Tierney 2019, Kapucu & Demiroz 2017) that resilience emerges from the interplay between formal systems and emergent practices. Our findings support this view, showing that temporary hybrid structures—like the *Equipe sisma*—can act as adaptive bridges between rigid hierarchies and informal collaboration.

For policymakers and service managers, several lessons emerge. First, resilience planning should not dismantle formal coordination structures in favor of complete decentralization, but rather invest in scalable models that can accommodate both order and improvisation. Second, pre-emergency investment in cross-sector relationships, interoperable information systems, and shared protocols could reduce coordination friction in times of crisis. Third, employment stability—particularly in the social care sector—is not only a labor issue but a structural condition for effective emergency response.

Conclusion

In this paper, we have tried to investigate the impact that a disastrous event can have on an interorganizational network that provides mental health and social services, through a specific case study: the 2016 earthquake in the Marche region of Italy. We have analyzed the evolution of relationships between healthcare and social welfare organizations regarding patient sharing and the frequency of regular meetings between staff affiliated with different centers. Results obtained through the use of SNA demonstrate how the structure of this network changed to adapt to new needs, as dictated by the emergency. Furthermore, the organizational structures that are typically centralized have a greater capacity to maintain a high level of integration.

Semi-structured interviews enabled us to explain the factors that determined changes in the network's structure and the level of integration.

Our findings show that the earthquake triggered a temporary decentralization of mental health services, weakening traditional coordination nodes but fostering more distributed and spontaneous collaborations. These emergent ties, facilitated by creating the "*Equipe sisma*" emergency unit, allowed for continuity of care despite structural disruption. However, once the emergency ended, the system returned to its pre-crisis configuration - suggesting that while a crisis can open windows for innovation, institutional routines remain powerful.

Theoretically, this study contributes to the literature on interorganizational networks by demonstrating that pre-existing centralized structures can offer greater resilience than previously assumed. Contrary to studies emphasizing the flexibility of decentralized networks during crises, our case suggests that robust formal coordination - when coupled with geographic spread - can buffer local failures and support continuity. This insight invites a more nuanced understanding of resilience that considers adaptability, redundancy, and institutional coherence.

Our results underscore the importance of hybrid coordination models that combine formal structures with the capacity for ad hoc collaboration during emergencies. Policymakers and service managers should consider designing “emergency interoperability protocols” that facilitate rapid integration across organizational boundaries when central nodes are compromised. Investing in pre-existing cross-sectoral familiarity (e.g., through inter-agency training or shared digital platforms) may also reduce coordination friction when a disaster strikes.

Limitations of this study include the partial availability of data from non-DSM centers, the reliance on self-reported estimates for meeting frequencies, and the absence of perspectives from frontline staff and service users. These constraints may have influenced the completeness and granularity of the network reconstruction. Future research could benefit from triangulating additional data sources and adopting a multi-level approach that includes micro-level accounts of coordination practices.

In conclusion, this study shows that interorganizational integration in mental health and social care is not only a structural issue but a dynamic process shaped by contingency, institutional design, and human agency. In emergency contexts, the resilience of these systems depends not merely on their formal architecture, but also on their ability to suspend routines and mobilize cross-cutting collaboration temporarily. By recognizing this interplay, health and social care systems can be better prepared to respond to future disruptions - without losing sight of the long-term goal: an integrated and equitable care infrastructure.

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