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COMMENTARY

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COVID-19, systems thinking and the ecology of disease: A focus on the family

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In his successful essay *Spillover*, David Quammen explains that the potential for infectious diseases is everywhere: any change of an ecosystem that modifies the interactions among organisms may trigger novel infections.[1] This immediately recalls Ludwig von Bertalanffy General Systems Theory, where a system is described as a pattern of organized relationships among elements, and any change of the elements or their relationships may affect the whole.[2] Systems are powerful constructs and metaphors for understanding human functioning and the biopsychosocial dimensions of disease, as originally theorized by Engel.[3] Indeed, each level of such biopsychosocial dimensions can be described as a system made of subsystems and included in wider, integrated wholes.

Systems are open to change and must display adaptability to survive. This is true for cells, organisms, families, and societies. It is also true for health care institutions whose scope is that of confronting with changing profiles of morbidity in society and a globalized world.[4] With its multiple demands, the COVID-19 pandemic is a challenging *stress test* for the health care system. Under the pressure of a rapidly and widely expanding menace, the current situation confirms that all the biopsychosocial dimensions of disease are closely interconnected as parts of the same *complex* reality.[5] The basic tenets of systems thinking thus can serve as guiding principles for an accurate analysis of such complex reality and the ecology of individual lives.[6] For human beings, this includes family relations, social networks, societies, and the cultural milieu, not forgetting the nonhuman environment.

In many societies, family relations have a special role, providing reciprocal support and mediating the relationships between individuals and larger groups.[7] In turn, families are constantly influenced by the dynamic interplay of their members and by sociocultural variables. The pandemic reveals such strong ties between family processes and social dimensions. As suggested by Jay Lebow, the current situation has led to an "international experiment about family life."[8] Such an experiment regards the definition and selection of close contacts with whom to maintain constant interactions, the chance (or not) to use virtual connections, family strategies for coping with co-occurring problems, such as work loss, pre-existing relational problems (domestic violence, caregiving for people with medical conditions or mental health issues), and loss of social resources. How to preserve and re-create family rituals in these circumstances that have a remarkable impact on daily habits and special ceremonies—including funerals—is another relevant theme.[9] There is also accumulating evidence that this pandemic, such as other global crisis, is having a more severe impact on fragile and underserved groups, shedding new light on inequalities and social injustice.[10] The pandemic sheds new light also on other pre-existing problems of specific populations, such as the long-lasting limitations in the social participation of people living with disabilities in many countries. For instance, our study on a sample of Italian patients undergoing neurorehabilitation programs revealed that such patients—somehow—were "already in lockdown."[11]

1 | INFECTIOUS DISEASES AND CURRENT HEALTH CARE POLICIES

The burden of acute infectious diseases has not been the center of attention in the last years, as most of the studies in the fields of medicine and psychology have been devoted to chronic diseases. This has comprehensible reasons, since the progressive refinement of medical treatment and prevention has drastically reduced the death rates for acute infections—at least in most western societies—directing the attention to populations aging with chronic conditions.[12] The study of families coping with illness has also been focused mainly on chronic diseases, although Rolland's Family Systems-Illness Model provides a thorough description of the impact of different medical conditions on close relationships, including infectious diseases.[13]

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However, through the progressive discouragement of long-term hospitalization, prevailing health care policies are mostly focused on dealing with chronicity, relying on the crucial role of informal caregiving within the family for disease management.[13] The new coronavirus has burst upon the scene, scattering the cards on the table. With its features of ease of transmission, wide-range variability in clinical presentations, and uncertain trajectories in terms of individual disease and general pandemic, the new coronavirus is imposing a multiple threat to family life and health.[14] This new menace is forcing families to adapt to unexpected circumstances, to try their belief systems in making sense of what is happening, and to take care of each member's safety. This is happening within the context of societies that, despite their different approach in managing risks, also share a common task of making sense of current events and finding effective solutions for a problem that has been—and still is—rapidly evolving.

The pressure on intensive care units is of particular concern for governments, caught in the trap of finding proper solutions to a crisis where the balance between health care and economy is critical. Such a political dimension has unequivocal implications, because the range of possibilities, in terms of clinical practice, are strongly defined by health care policies. For instance, with such a rapidly spreading infectious disease the family household could be no longer a safe place to be, or where to receive care. This leads to different patterns of cohabitation—or isolation—that can provoke fears and impact family life in terms of daily lives and availability of reciprocal support, not forgetting the special condition of family members living in nursing homes.[15] One of the most excruciating aspect of close relationships during this pandemic is that many people have coped with the acute phase of their illness—or have died—alone. It could be defined a condition of denied support or truncated family caregiving. Basically, many families all around the world are suffering from multiple losses: the loss of beloved ones, the loss of proximal relationships, social contacts, and financial resources.[16]

2 | IMPLICATIONS FOR RESEARCH AND PRACTICE

With respect to research, probably there is the need for multiple methods to study families coping with the current situation. A progressive trivialization of evidence-based health care has led to an exclusive prioritization of randomized controlled trials (RCTs) and an overshadowing of other sources of knowledge, and this is particularly evident in the event of an emergency.[17] RCTs are obviously the gold standard for research evidence when it is possible to isolate—at least to some extent—a targeted variable, but they are less useful when the object of scrutiny is made of a complex set of dynamically intertwined variables.[18] Furthermore, quantitative research is not well-suited for deeply exploring meaning-making processes in individuals, families, and social groups. Clinical expertise, and patient preferences, that were the other two of the three legs of evidence-based medicine as it was originally conceived, must regain the proper attention.[19] Qualitative research to investigate personal and relational experiences in these circumstances of collective distress, and well-established frameworks and models for observing and treating families facing distressful conditions, may be crucial resources in this new and ever-changing situation. The aforementioned Family Systems-Illness Model, within the framework of a resource-oriented approach to help families coping with relevant crisis, may serve excellently to this scope.[13,20] Other specific clinical suggestions for the situation at hand have been recently proposed.[21,22]

A core tenet of systems thinking is that adaptive systems find their optimal balance between coherence and flexibility, between integration and segregation, which means letting certain degrees of autonomy for their elements.[2] Indeed, this is true for families—with their need for balancing togetherness with separateness—but also for goal setting in health care systems, which must behave as *complex adaptive systems* if they are called to face problems that are constantly changing and extensively disseminated.[4] This ties tightly clinical practice with the political level. Practice is embedded in the context of society and, in turn, any clinical decision making can have social or political implications. Thus, as proposed by Watson and colleagues, family therapists and researchers who study family processes have an ethical responsibility that stands at the crossroad among cultural values, social determinants of health and collective trauma.[10] Relevant examples of acting and working within this framework, and with the involvement of multiple institutions, have been documented for the treatment of under-resourced families in California.[23]

Family studies and interventions must cultivate and strengthen their connections with complex strategies where every single act is based upon the awareness of multilevel biopsychosocial implications. As Sturmberg puts it, the health service level, the policy level, and the biomedical level are constantly interconnected in a dynamic system, and any change at one level can have consequences—even if not always apparent—on the others.[5] Within this framework, the role of families in mediating the relationship between the individual and society—including health care systems—is well-established, even if not always and properly emphasized.[24,25] It is fundamental to investigate how this pandemic is affecting family lives and how family relations still can be precious sources of resilience, connecting the nodal point of close relationships with individual vulnerabilities and the big picture of society.

CONFLICT OF INTEREST

The author declares no conflict of interest.

DATA AVAILABILTY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study, which is not based upon new experimental research.

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