

Co-production: Strategic Lever for Dehospitalization and Redefinition of Organizational Structures in Healthcare

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Abstract

Objective - The explosion of the covid-19 pandemic has led to the need for all world governments to redefine the way in which they provide health services. This is particularly true for Italy, as the hospital-centric emergency response model adopted in the first pandemic wave to contain and combat the health crisis and to treat affected patients proved ineffective. The purpose of this work is to highlight how the model of co-production, based on the enhancement of territorial services and 3T strategy (*Tracing, Testing e Treating*), may be the most appropriate paradigm to address the emergency.

Methodology - Through an in-depth analysis of co-production model emerging from the scientific literature, we highlight the critical success and enabling factors that make the model applicable in healthcare in the Covid-19 emergency context and the advantages of the paradigm.

Findings - The nature of the emergency could incentivize citizens to spontaneously participate in co-production activities, provided a favorable social and legislative context. Co-production could allow to implement the 3T strategy effectively and efficiently.

Keywords: co-production, community, territory, Covid-19, citizens, 3T strategy

1. Introduction

Coronavirus SARS-CoV-2 is a respiratory virus belonging to the coronavirus (CoV) family, characterized by high transmissibility. The pandemic caused by this virus has prompted many world governments to redefine and reorganize the way in which they offer their health services, enhancing territorial services. Dealing with emergencies on the territory, not in hospitals, is the most effective solution (Bonomi Savignon et al., 2020). In Italy, where the national and regional policies adopted have mostly focused on the hospital-centric management of emergencies (Cepiku et al., 2020), the results obtained have been dramatic. Inpatient facilities have experienced a dramatic increase in demand due to the steady increase in the number of Covid-19 patients in the territory. The rapid saturation of beds, leading to a reduction in hospital services (e.g. surgery, day hospital, long-term care, etc.) has not been the only phenomena that has shown the limits of emergency healthcare policies. The failure to strengthen territorial health networks and the lack of focus on logistical issues has led to a reduction in territorial health care and a lack of resources for prevention and treatment of patients Covid-19 (OASI, 2020; Rosa et al., 2022). The Report of the Osservatorio sulle Aziende e sul Sistema Sanitario Italiano 2020 (OASI 2020) highlighted the urgent need to change healthcare policy strategies by focusing on prevention, tracking and territorial services. The OASI 2020 report adopts the recommendations of the World Health Organisation (WHO), resulting from the analysis of the best practices adopted worldwide. WHO studies recognise the three Ts (3T) strategy as the most effective strategy for containing the emergency and reducing the mortality rate. 3T strategy consists of: testing as many people as possible with swabs or serological tests; tracing the contacts of positive cases in order to test them and isolate them from the community; treating the sick with coordinated hospital and home care. Countries such as South Korea and China, for example, have succeeded through targeted prevention and tracking interventions in reducing infection rates and intervention times. Testing and tracing have indirectly increased the effectiveness of medical treatment and reduced mortality (OASI, 2020).

The process of adopting the 3T at macro level could be extremely difficult. For example, the successful implementation of the 3T strategy in Italy may take a long time due to the current healthcare context

characterized by weak and fragmented territorial monitoring and care networks and the lack of the necessary technical and human resources. Moreover, 3T implementation would require a great effort on the part of the entire National Healthcare System in reallocating territorial resources and in managing new figures of health professionals and not. Thus, these considerations lead to the need for the identification of useful paradigms to facilitate the implementation of the 3T strategy. These paradigms should, on the one hand, guide and simplify the implementation of each of the three phases of the strategy and, on the other hand, avoid the excessive use of resources (new or already allocated) and the high governance efforts by the authorities. Co-production, defined as the process of involving citizens in the production of welfare services, is one of the paradigms for addressing the major challenges of public governance. Based on the above premises and in order to address the current health emergency, the following article aims to discuss the feasibility of implementing the co-production paradigm in Italy. To this end, a critical review of existing literature is presented. In particular, starting from an in-depth analysis of the meaning of co-production, of the critical success/failure factors and of the advantages/disadvantages of the model, co-production will be analyzed in relation to the current Italian context in order to assess its effectiveness as a response to the health emergency. The critical analysis of scientific articles related to co-production does not only and exclusively include its implementation in healthcare, but also in services, this to improve insights with respect to the context of analysis. The article concludes with some discussion and reflections on the meaning of co-production in the case of the current emergency, on the advantages/disadvantages deriving from the application of the model and the conditions necessary for its full implementation.

2. Literature Review: Co-Production Definition and Analysis

2.1 Development of the Co-Production Concept

The concept related to co-production first appeared in literature in 1815. Henri Storch conceived it to highlight the necessary cooperation between producer and consumer in services. However, for over a century and a half, this concept was never developed, gaining prominence only in the 1970s. The word co-production was coined, for the first time, at the end of the 70s by Elinor Ostrom, winner of the Nobel Prize for Economics in 2009. The American political scientist, in association with the Workshop in Political Theory and Policy Analysis at Indiana University, highlighted the critical role of ordinary citizens in the creation of public security services. She argued that the best controlled communities were those capable of self-policing and that the effectiveness, of police interventions on public safety, was not a function of police input, but of the behavior of the controlled citizens. In contrast to the dominant theory of governance at the time, which foresaw a strong centralization through bureaucracy, the scholar highlighted the difficulty in producing and delivering services without the participation of the recipients. Citizens, in fact, should not be defined as clients, since the term "client" distinguishes the passivity of the subject. On the contrary, citizens constitute an active part in the conception and realization of the process of service production, through negotiation (Lipsky, 1980; Ostrom, 1996). As early as 1968, Victor Fuchs emphasized that the consumer actively participates in the definition of services, since services, in contrast to material goods, are based on a participated relationship between the consumer and the producer. Thus, in the service sector, the consumer was defined as an influential 'production factor'. In 1980, Alvin Toffler introduced a new category of consumers: the "prosumers". The prosumers play the role of consumer and producer simultaneously. Examples are home pregnancy tests or bank tellers. The consumer becomes a producer not only when participating in the specification of the service and the assessment of the quality of the service but also during the use of the service and thus in the creation of value for the customer and the provider. (Cinquegrani et al, 1994). Richard Normann, leveraging one of the Latin roots of the word consumer, namely "complete" has highlighted how consumers become creators of value, at every stage of the business process (Batalden et al, 2016). Consumers, i.e. citizens, are the main element around which the concept of co-production is developed. They, in fact, are: a source of innovation, since they know things that professionals ignore; critical success factors since they can increase the effectiveness of a service; resources in terms of time, financial, data and information; characterized by qualities and skills aimed at being shared with professionals and guarantors of progress and community development (Bovaird & Loeffler, 2013). Therefore, it is important to place the user at the center since he or she constitutes the starting point for the creation of value in a service that lives up to expectations, as well as effective and satisfying (Rindfleisch et al. 2019).

The co-production of public services has been the subject of analysis by numerous scholars in various areas of inquiry. Consequently, over time, several definitions of co-production have been proposed and even today there is no single unambiguous definition (Table 1).

Table 1. definitions of co-production

No	Authors	Definitions
1	Brudney & England (1983)	“an emerging conception of the service delivery process which envisions direct citizen involvement in the design and delivery of city services with professional service agents”
2	Ostrom (1996)	“By co-production, I mean the process through which inputs used to produce a good or service are contributed by individuals who are not “in” the same organization.”
3	Ramirez (1999)	“Value co-produced by two or more actors, with and for each other, with and for yet other actors”
4	Joshi & Moore (2004)	“Institutionalised co-production is the provision of public services (broadly defined, to include regulation) through regular, long-term relationships between state agencies and organised groups of citizens, where both make substantial resource contributions.”
5	Bovaird (2007)	“We define user and community co-production as the provision of services through regular, long-term relationships between professionalized service providers (in any sector) and service users or other members of the community, where all parties make substantial resource contributions”
6	Alford (2009)	“Co-production is any active behavior by anyone outside the government agency which: is conjoint with agency production or is independent of it but prompted by some action of the agency; is at least partly voluntary; and either intentionally creates private and/or public value, in the form of either outputs or outcomes”
7	Boyle & Harris (2009)	“Co-production means delivering public services in an equal and reciprocal relationship between professionals, people using services, their families and their neighbours. Where activities are co-produced in this way, both services and neighbourhoods become far more effective agents of change.”
8	OECD (2011)	“collaborative approaches where citizens or service users engage in partnerships with service professionals in the design and delivery of a public service”
9	Bovaird & Loeffler (2013)	“Co-production is “public services and citizens making better use of each other’s assets and resources to achieve better outcomes or improved efficiency”
10	Fledderus (2015)	“an arrangement within which both customers and producers contribute various activities at the point of public service delivery.”
11	Brandsen & Honingh (2016)	“Co-production is a relationship between a paid employee of an organization and (groups of) individual citizens that requires a direct and active contribution from these citizens to the work of the organization”
12	Nabatchi et al. (2017)	“the involvement of both users and public sector professionals in the delivery of public services”

Analysis of the various definitions reveals the main factors that characterize the co-production:

it is a collaborative approach based on regular, institutionalised, long-term relationships between state agencies and service user or other member of the community (i.e. citizens, organized groups of citizens, non profit organizations) aimed at responding effectively to citizens' demand for services and at improve the use of public and community assents and to

2.2 Categorization of Co-Production Patterns

The definition analysis shows that the creation of conditions enabling citizens to co-create is mandatory. These conditions must allow effective user-producer interaction by fostering integration between the actors through elements such as: procedures, regulations, physical artefacts, technological systems, sharing platforms, communication systems etc (Verma et al., 2012; Schiavone et al., 2020). Alford (2009) believes that governmental organizations themselves should require citizen input into the production process and thus establish the necessary conditions that can enable it. Pestoff (2012) makes explicit that governments should look for innovative methods in order to involve citizens in co-production activities. In this way, the user experiences an experience from which positive emotional, cognitive and behavioral feelings arise (Schiavone et al., 2020).

Based on the nature of the relationship between citizens and public administration Osborne et al. (2016) identified four different types of co-production in public service delivery (Table 2).

Table 2. The four types of co-production

		Locus of co-production		
		Individual service	Service system	
Nature of co-production	Involuntary	I: Co-production	III: Co-construction	Towards the co-creation (or co-destruction) of value
	Voluntary	II: Co-design	IV: Co-Innovation	

The vertical dimension of the framework incorporates the "Nature of co-production" i.e. how the authorities involve the citizen or community in the design and evaluation of services.

The horizontal dimension concerns the "Locus of co-production" i.e. the impact of the individual service or a system of services.

Each quadrant also corresponds to a different value of co-production for the citizen and the community. Quadrant I concerns CO-PRODUCTION. It represents a type of pure co-production in which the user co-produces the service experience with the service staff. This process is involuntary in that it may be unconscious on the part of the user. A fundamental characteristic is that it is impossible to avoid involvement during the process, since even resistance or rejection of an act of co-production by the user is equated with an act of direct or indirect involvement. Consequently, both parties choose whether or not to engage in this existing process to try to improve the experience, the process and the resulting results, or to ignore it and accept the indirect implications anyway. Conscious active engagement of those involved, however, brings improvement in the production process and in the quality of service delivery. Quadrant II concerns CO-DESIGN, i.e. co-production as a conscious and voluntary act. It creates value within public service delivery systems with the goal of improving the design and delivery process. It requires the active involvement of the service user in all processes, from design to evaluation, in order to improve the performance of existing public services. Quadrant III pertains to CO-CONSTRUCTION, that is, the intrinsic experience of the service user interacting with the service system to co-construct public value. On the one hand, the service user's personal life experience will influence how they relate to the service, thus bringing expectations or abilities to the service experience. While the lived experience within the entire service system will impact the 'personal experience of the service user. Finally, Quadrant IV is about CO-INNOVATION. It focuses on the voluntary and informed involvement of the service user in order to improve the existing service and introduce new forms of public service delivery. There is a high level of attention on how the production of the service takes place within the system itself and on the possibility of introducing new tools and methodologies useful for improving the quality of services.

The co-production contributes to the:

IQ-IIQ: external, social, impact and effectiveness of public services in real time;

IIIQ: sense of well-being that results from this realtime activity;

IVQ: facilitation of the evolution of individual and community capacity to respond independently to social needs in the future.

The involuntary nature of co-production should not be understood as a total absence of systems and policies for collaboration or regulation of relations between authorities and citizens. Only the activation of forms of co-production is involuntary. In fact, if they generate value, they must be institutionalized and regulated in order to be sustainable. Obviously, efforts to implement a co-production relationship on a voluntary basis will require greater commitment and a less spontaneous process of introduction. This observation can also be applied to the locus of co-production. Co-production for the individual service will require far less governance effort than implementing co-production across a system of services. This is because the number of actors involved in the relationship tends to increase with the complexity of the relationship and the number of services to be integrated. However, Osborne et al. (2016) highlighted that as levels of difficulty increase from involuntary to voluntary in

nature and from single service to Service System, the benefits potentially achievable would prompt authorities to begin a journey of implementing co-production processes.

2.3 Advantages and Disadvantages

The concept of co-production highlights the inseparable link between the production and consumption of services. The service is created only if its recipient takes part in its production process, and its quality is the result of a strong influence between the client and the service provider. The greater the client's participation in the service production process, the greater the effectiveness of the results achieved. Co-production generates direct benefits for citizens, the community and service providers. Service users, being involved in the production process, can directly influence the results. This is an important advantage as it enables the production of services that conform to the expectations and needs of consumers. Users do not evaluate the service only by experiencing the impact on their lives that results from its use, but by evaluating the entire process of providing the good such as the professionalism of the medical staff or the cleanliness of the department. In this way, more weight is given to the customer's evaluation, which has the greatest impact on how the service is produced (Cepiku et al., 2014). In addition, the possibility of soliciting the impulse of citizens to contribute to the creation of value for the community is developed. In fact, co-production is a source of citizen transformation, as it enables the rebirth of democracy in modern welfare states by ensuring new connections, erected on ethical norms, trust and accountability, between citizens and the state (Alford, 2011; Cahn et al., 2012; Ostrom, 1996; Pestoff, 2006, 2009; Vamstad, 2012; Warren et al., 1982:593; Cepiku et al., 2014).

These benefits can be of different nature and can be relevant for a multitude of stakeholders (Bovaird et al., 2013). For example, citizens might experience benefits related to extrinsic rewards such as economic benefits or intrinsic rewards such as solidarity and altruism, as well as desired changes to regulations (Alford 2009). Service users enjoy higher quality public services that are more responsive to their needs and aimed at providing a better quality of life. The community may well experience an increase in social capital and social cohesion. Staff may gain more responsibility and motivation through customer satisfaction, and trust in institutions may experience increased support from citizens and greater stability.

In addition to the advantages listed above, possible disadvantages of co-production are discernible in the literature. One of them concerns the disparity between social classes, as co-production would be accessible only to specific groups leading to the exclusion of others (Bovaird & Downe, 2008; Brandsen & Helderman, 2012; Sharp, 1980; Cepiku et al., 2014). Another disadvantage relates to the possible risk of fraud or malpractice if resources were allocated to users. Again, there could be increases in transaction costs and, due to the high customization of services, a decrease in economies of scale. In addition, excessive fragmentation would be detrimental to the whole-of-government approach of governments. However, these disadvantages must be considered as situations to be solved for an effective and efficient implementation of a co-production model (Cepiku and Giordano, 2014).

2.4 Critical Success Factor and Barriers

There are three types of motivational factors that drive people's behaviors: extrinsic, intrinsic, and prosocial motivations (Cepiku et al., 2020). Extrinsic motivation refers to the willingness to engage because it is driven by outcomes external to the work itself (Amabile 1993; Brief and Aldag 1977). Intrinsic motivation refers to the desire to engage related to interest and pleasure in performing a given task (Ryan and Deci 2000). Finally, prosocial motivation concerns the willingness to engage in order to positively impact the lives of others (Grant 2008). These three motivations have been analyzed in correlation to the concept of coproduction, classifying them into strictly individual or community-related motivations. For example, Alford (2009) links the desire for tangible benefits to a strictly personal and individual material interest. However, there are needs and values that drive individuals to participate in co-production projects even if it disadvantages them financially or ensures no economic return. For example there is the need for sociality (Sharp, 1980; Alford, 2002; Verschuere et al., 2012; Vanleene et al., 2017) or normative values that move citizens towards non-tangible rewards such as satisfaction for good deeds. This is where self-determination theory comes in. It suggests that intrinsically motivated people coproduce because they enjoy performing coproductive activities (Fledderus et al., 2015), and the activities in which they are involved attract their interest, increase their self-esteem and self-determination (Alford, 2002). Finally, it is important to note the importance of prosocial motivation in influencing the willingness to co-produce. Indeed, although there are multiple types of co-producers, they are all driven more by prosociality than by other extrinsic motivations (Cepiku et al., 2020).

3. The Application of Co-Production in Healthcare

Hippocrates argued that the physician should not only do what is right but also allow the patient to collaborate

(Batalden et al., 2016). Co-production in healthcare allows not only for better outcomes, but also for the development of a shared perception of the problem and thus the determination of a shared plan for service evaluation and management (Batalden et al., 2016). Many studies on co-production in Healthcare have highlighted the benefits at both the systemic and micro organizational levels for both patients and citizens. Vennik et al. (2016) identify the three benefits that providers derive from co-production, related to "quality-of-care logic," "organizational logic," and "market logic." With respect to the quality-of-care rationale, co-production allows providers to understand how patients experience care delivery and consequently improve the quality of care based on experiences. Regarding "organizational logic," co-production allows for improvements in organizational aspects within the hospital. For example, the organization of a department or an infusion room. Finally regarding the "market logic", by implementing co-production projects, the hospital can strengthen its market position, improve public relations, meet the conditions of health insurers and finally share national health trends such as more transparency and patient participation. There are many benefits of co-production that professionals enjoy (Marsilio et al., 2021). They experience: increased job satisfaction (Den Boer et al., 2017; Ding et al.2019; Van del Meer et al., 2018); increased well-being both physically and mentally (Den Boer et al., 2017; Van der Meer et al., 2018; Finamore et al., 2020); increased work engagement and motivation due to active involvement and increased willingness to perform their tasks (Ding et al., 2019; Chen et al., 2015; Hastings et al., 2018); a positive change in behavior related not only to skills but to how one relates to patients by developing more empathy (Lamph et al., 2018; Finamore et al, 2020, Hastings et al., 2018, Dickens et al., 2019; Davies et al., 2014, Horgan et al., 2018, Mannig et al., 2017); increased trust patients place in them (Banyte et al., 2014; Jo et al., 2019). The benefits enjoyed by patients are those most analyzed in the literature (Marsilio et al., 2021): improved health status, greater satisfaction, empowerment understood as active involvement in personalized treatment and care plans, self-management, self-efficacy, self-esteem, self-confidence, eustress, learning, a change in behavior, awareness of problems, cost savings.

Finally, co-production in healthcare also creates value for the generality of citizens classified in value for the community and value for society (Cepiku et al. 2020). Value to the community is understood as increasing citizens' trust in providers and better understanding of service costs and procedures through direct collaboration. Value to society was defined as the result of three co-production effects: democratization of the process, equitable distribution of effects on society, and increasing public acceptance.

A final but relevant advantage of co-production is its being an iso-resource model. It does not require large investments, the necessary hiring of new staff or control systems. As a result, it is an advantageous tool with no significant burden (Cepiku et al., 2020)

Previously, the traditional system of production and delivery of health services was characterized by a strong central role of professionals, who were the only ones who had to design and deliver services to patients. In contrast, the latter were considered passive recipients of services and had no say, or possibility of intervention, in the process of service formation (Boivin, 2012; Farr, 2012; Vennik et al., 2015).

In the last decades, the concept of service co-production is gaining importance in the field of health care provision, where it is associated with some buzzwords, such as: patient empowerment, patient involvement, patient-centered care, and self-management of care (Adams, 2011; Bate & Robert, 2007; Vennik et al., 2015).

Co-production of health care services focusses on the establishment of a co-creating partnership between the provider and the user, in a "micro" perspective of enhanced value creation (Osborne et al. 2013). It implies that health care management is no longer oriented toward patient care, but rather the patient experience during the clinical service delivery process (Schiavone et al., 2020). A health service therefore involves a necessary form of collaboration between physician and patient, aimed at maximizing the quality of health and physical well-being, on various levels such as co-design and co-funding of services or co-assessment of services (Loeffler et al., 2013; Batalden et al., 2016).

Table 3. Benefits of co-production for providers, professional, patients, community

Level	Benefits	Authors	
PROVIDERS	quality-of-care logic	Vennik et al. (2016)	
	organizational logic	Vennik et al. (2016)	
	market logic	Vennik et al. (2016)	
PROFESSIONALS	increased job satisfaction	Den Boer et al., 2017 Ding et al., 2019 Van del Meer et al., 2018	
	increased well-being both physically and mentally	Den Boer et al., 2017 Van der Meer et al., 2018 Finamore et al., 2020	
	increased work engagement and motivation	Ding et al., 2017 Chen et al., 2015 Hastings et al., 2018	
	change in behavior	Lamph et al., 2018 Finamore et al., 2020 Hastings et al., 2018 Dickens et al., 2019 Davies et al., 2014 Horgan et al., 2018 Mannig et al., 2017	
	More trust by patients	Banyte et al., 2014 Jo et al., 2019	
PATIENTS	improved health status	Span ò et al., 2018 Brown et al., 2020 Sweeney et al., 2015 Pham et al., 2019	
	satisfaction	Ding et al., 2019 Sweeney et al., 2015 Hau et al., 2018	
	empowerment	McAllister et al., 2018	
	self-management	Marsilio et al., 2021	
	self-efficacy, self-esteem, self-confidence, eustress	Marsilio et al., 2021	
	learning	Marsilio et al., 2021	
	change in behavior, awareness of problems	Marsilio et al., 2021	
	cost savings	Marsilio et al., 2021	
	COMMUNITY	Value for community	Cepiku et al., 2020
		Value for society	Cepiku et al., 2020

4. The Application of Co-Production as a Solution to the Covid-19 Emergency

In Italy, the National Health System is finally disengaging from the previous "hospital-centric" logic that has contributed so much to aggravate, especially in some regions, the impact of the new coronavirus epidemic and, finally, articulate the system on three pillars, all fundamental and balanced between them: the hospital, general medicine and territorial public health. The same FIMMG national secretary highlighted how in the first phase of the emergency the government completely bypassed territorial assistance. There was a strong strengthening of hospitals, new facilities were created, intensive care beds were increased and only later was it delegated to the regions to organize through the USCA-U (Special Continuity of Care Units), the territorial assistance (Cepiku et al., 2020). Each USCA has the task of assisting COVID-19 patients at home, hospitalizing, early and exclusively, serious cases, thus supporting general practitioners in the management of COVID or suspected COVID patients in the territory. They should have been set up by March 20, 2020 on the entire national territory but, at the end of the year, the differences between the various Italian regions were evident. The majority of the regions managed to deliberate the Usca within the tight timeframe indicated by the national law. Their actual implementation, with the constitution of dedicated teams, however, has in fact undergone different delays in the various regions. The main problem is that the constitution of the Usca takes place on voluntary adhesion of medical personnel. There is no recruitment activity, therefore, in many cases, the number of accessions has not been sufficient to cover the required posts. Moreover, the means of transport and the necessary devices of individual protection are often lacking. The Usca, therefore, which could have been a way of strengthening the territorial garrisons and developing tracking activities, has not had the diffusion and use hoped for. Today, after almost two years, the objective is to create at least one every 100,000 inhabitants and therefore 600 throughout Italy. Currently, a document is being developed by Agenas and the Ministry of Health on "Models and standards for the development of territorial care in the National Health Service". It is aimed at defining the structure and tasks of

the USCA for the coming years. This document, which in the coming weeks should receive the green light from the Regions, is one of the crucial measures envisaged for spending the resources of the NRHP on the territory. The Usca will be composed from at least 1 doctor and 1 nurse every 100.000 inhabitants and they will operate on the territory also through the use of instruments of telemedicine like the televisita or the teleassistenza. They will not replace but support, for a defined time, the professionals responsible for taking care of the patient and the community. The real problem, however, is that they require professional figures, of which there is currently no availability, thus presenting as not inclusive enough and there is no homogeneous diffusion at the territorial level (Cepiku et al., 2020).

The weakness of territorial assistance, assistance that was already neglected and impoverished in some regions before the emergency developed, represents in fact a fundamental problem for the establishment of a model of co-production. It is therefore necessary to reorganize territorial health care in such a way that the dehospitalization process is accompanied by a corresponding and contextual strengthening of health care on the territory and coordination between general practitioners and specialists (Benvenuto et al., 2020). This, in order to decongest hospitals and meet the needs of continuity of care at home, decreasing in fact readmissions to hospital and educating patients to safety in the continuity of care, the so-called transitional care. This involves, for example, the use of mobile units for swabs and serological tests, home care protocols for paucisymptomatic patients, and telemedicine tools. Essential is in fact the use of digital systems such as Apps, online portals that allow the exchange of information, teleconsultations, tele-monitoring and so on. Such a widespread organization allows to (Cepiku et al., 2020): lighten hospitals, improve clinical effectiveness and decrease the contagion of operators and citizens.

The second fundamental component for the application of co-production is the collaboration of the community and therefore the citizens, that is, the development of a community-based approach, a method based on the principle of participation that should promote the empowerment of the community, equipping it with a structure that can facilitate the management of the emergency. In fact, the government, in this emergency, as in all crisis situations that may affect the country, needs a strong collaboration with a range of partners, not only governmental but citizens and non-profit organizations (Kapucu, 2006; Miao et al., 2020).

In this perspective, co-production is fertile ground that our country needs to implement the so-called 3T strategy.

The 3T strategy is considered as one of the best models to respond to the pandemic crisis requires great efforts from the health care system. These efforts could be in vain if citizens do not actively participate in service delivery processes (OASI 2020). Thus, co-production in Italy emerges as the necessary tool to address the pandemic. In fact, the model is optimal for the effective application of the "three T strategy". The three Ts stand for:

- Test as many people as possible with swabs or serological tests;
- Follow up contacts of positive cases with apps or surveys to test them and isolate them from the community;
- Treating sick people with coordinated care in the hospital or at home.

Around the world, different levels of co-production have been implemented to make adoption of the 3T strategy effective and efficient (for example):

- Most countries have encouraged the use of face masks and personal protective equipment (co-production)
- South Korea: SMG COVID-19 Rapid Response team (SCoRR team) has been formed, including epidemiologists, SMG Special Judicial Police Bureau for Public Safety, and administrative experts such as public health officials, who support epidemiological investigation and operate countermeasures in case of hospital infections or group outbreaks due to unknown sources (Co-construction)
- Pakistan: Researchers from the Medical Research Council, the National Institute of Health, and other academic and policy institutions collaborated on a new platform to collect and analyze local data to inform and shape government response (Co-Design) (Marten et al., 2021).
- Germany: The German National Academy of Sciences convened a panel of experts including philosophers, historians of science, theologians, and jurists to advise the government on how to ethically emerge from initial arrests and relax its restrictive policies (Co-Innovation) (Marten et al., 2021).
- Italy: The Veneto region approved guidelines for volunteer activities under the Covid-19 epidemiological emergency (Co-Innovation) (Cepiku et al., 2020).
- England: NHS call in March 2020 for 250,000 UK volunteers to help address the consequences of Covid-19 (Co-Innovation) (Cepiku et al., 2020).

The first two T's of the paradigm outlined above are actions that through citizen empowerment can be accomplished with speed and few problems.

Rapid swabs, although not as effective as a molecular swab, have often been one of the vehicles for virus detection in asymptomatic or paucisymptomatic individuals. At a time when, on the one hand, the same eligible persons are not able to use molecular swabs through the SSN and, on the other hand, the rapidity of contagion of the Omicron variant may cause the circulation of an important number of positive but unaware subjects, rapid swabs appear to be one of the possible solutions to calm the number of potential infected citizens and induce them towards isolation in case a positivity is detected.

The solution identified by Prenestini and Marsilio (2022) is to trigger a path of co-production of prevention activities to Covid-19 that also allows citizens to self-test at home to define with greater confidence their freedom of movement, while maintaining the recommendations in terms of distance, masks, sanitation.

There is therefore a need to involve citizens.

The natural willingness of citizens to collaborate in co-production processes in the Covid-19 context, arises essentially for three reasons:

1. **SOCIAL MOTIVATION:** A greater sensitivity develops as well as a greater sense of community and belonging. People are willing to help in emergency situations. An example of this is the multitude of volunteers organized into non-profit organizations who have volunteered to help the vulnerable, provide home care, medicine delivery, etc;
2. **AFFECTIVE MOTIVATION:** Concern for loved ones develops and this leads to a desire to protect them through individual medical devices and compliance with safety measures;
3. **INDIVIDUAL MOTIVATION:** the desire and need to protect oneself to avoid contagion develops.

During the crisis generated by Covid, there was a great mobilization by citizens, nonprofit organizations and associations to help the most vulnerable affected by the virus. A great example is that of the Chinese population. Following the development of the emergency and especially after the wide spread of the virus occurred due to the Spring Festival, an important national holiday in China, there was an exponential increase in volunteers to support those who needed more help. The Chinese government itself, over the past decade, has understood the vital role of citizenship and collaborative and volunteer activities, activities that have been established and consolidated since 2008 following the Sichuan earthquake and subsequently during the Beijing Olympics and the 2010 World Expo in Shanghai (Moore, 2019; Schwarz et al., 2020; Cheung et al., 2012; Miao et al., 2020). It is the government itself that authorizes organizations that manage volunteers to legitimize volunteer activities (Wu et al., 2018; Hu, 2020; Miao et al., 2020). This mechanism highlights a top-down version of co-production termed "state co-production" (Li et al., 2019; Miao et al., 2020), characterized by the state carrying out activities aimed at controlling critical components and defining priorities and goals to be pursued. Italy, for its part, has also witnessed a profound mobilization of community and nonprofit organizations. The Italian landscape is composed of many organizations that provide services and health care, such as: ANT, AIL, VIDAS, AVIS, voluntary hospital associations (AVO), social cooperatives dedicated to the non-self-sufficient elderly and those with various disabilities (Cepiku et al., 2020). Indeed, numerous organizations took the field during the covid-19 emergency. The Italian Red Cross, for example, in collaboration with the Ministry of Health, has gathered the support of hundreds of volunteers ready to give the help needed in this crisis situation. These volunteers are engaged, for example, in the free emergency drug service for the elderly and for all those who cannot go to the pharmacies on their own. It would be important to train these volunteers to be a real support tool for health workers and allow them to act with knowledge and effectiveness. Despite this, little importance has been given to the nonprofit sector. The intervention strategies defined have given little luster to this fundamental sector in this period of deep crisis.

5. Concluding Reflections

The covid-19 emergency has brought to light the numerous problems that afflict the National Health Service. The national and regional policies adopted, focused on hospital-centered management of emergencies, have proved inadequate. The latter have led to profound pressures on hospitals, which have witnessed a rapid saturation of beds and a reduction in medical-surgical services. In addition, there has been a strong reduction in territorial health services as well as a high lack of resources for the prevention and treatment of covid patients. In fact, the management of the emergency was characterized by few reagents for swabs and serological tests started late, poor home treatment and tracking still in the experimental phase. These are the elements at the base of the three T's strategy in which the Government has shown its limits in dealing with the coronavirus emergency. From

the analysis carried out, it is clear that co-production is an important and suitable model for dealing with the crisis arising from the covid-19 pandemic. It presents itself as the tool of easy implementation, for the proper implementation of the three T's strategy, without high investment and management costs. The effectiveness of co-production is determined by:

- community trust in the authorities;
- planning of co-production activities;
- institutionalization of relations between community and authority;
- adequately train all the actors involved and therefore also citizens;
- ICT system to facilitate collaboration;
- Promotion and communication strategy (Cepiku et al., 2020)

The national government must play a key role in its implementation by providing the resources, tools, and incentives to train citizens, specialized nurses, and organizations so that they can be motivated and supported by the institutions. There is a need for more training, the development of new skills and knowledge not only for professionals but also for the community in order to train citizens prepared for emergency situations such as the one we are experiencing and who can carry out support activities for those involved in the front line. In fact, co-production is a valid tool between the health context, such as transitional care, and the pure services, i.e. those managed by ordinary citizens such as the distribution of medicines or the purchase and delivery of basic necessities to covid-19 patients forced into home isolation. It is essential to involve voluntary organizations, organizations that for their characteristics and propensity play a key role and high support to the health system. Moreover, for a co-production project to produce results, a redefinition of territorial assistance is essential. Also in this area, the Government is called to strengthen and reorganize the National Health Care System by providing a hospital network that allows a good distribution of resources and, above all, points to the improvement of the quality of health services within the national territory. An infrastructural renewal of this network is necessary. It is necessary to invest in digitalization, the unification of small hospitals and the renovation of larger ones. Digital is an important tool that brings health professionals closer to citizens and allows them to exchange useful information and carry out monitoring, teleconsultations in order to be always updated on the situation. The OASI 2020 report itself, among the strategic priorities to be put in place, recognizes the need to invest at least 30% of resources in digital health. In fact, numerous digital systems have been developed to ensure forms of communication between patients and doctors during emergency situations. An example is the #Accasa digital system, developed in Puglia, for home monitoring of patients suffering from covid. It emerges, therefore, the need to set up a collaborative governance that allows to involve government, community, private organizations to achieve results, complex or even impossible to achieve individually.

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