

Italian National Recovery and Resilience Plan: a Healthcare Renaissance after the COVID-19 crisis?

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Abstract. Proposed for the first time by European Commission in May 2020, the “NextGenerationEU” (NGEU) program is the European Union’s most important effort to address key issues relating to public health and healthcare, digital and technological innovation, climate change, sustainable mobility, and key sociocultural aspects. In addition, the NGEU represents a response to the COVID-19 crisis through an extremely powerful financial intervention (over 800 billion euros). Italy is one of the main recipients of the NGEU plan’s resources with almost 200 billion euros received in grants and loans. Implementation of the NGEU in Italy will take place through the National Recovery and Resilience Plan (NRRP). The NRRP not only describes how the NGEU resources will be used, but it singles out crucial public law reforms in national legislation and organization. Unsurprisingly, public health intervention represents a major component of the NRRP. Here we summarize and discuss the rules, regulations and perspective envisaged by the NRRP to foster effective healthcare and to reshape the Italian National Health System through the redesigning of primary care, enhanced communication between hospital and community healthcare, and stronger implementation of digital technologies in public health. (www.actabiomedica.it)

Key words: COVID-19, resilience, recovery, healthcare, National Recovery and Resilience Plan, community, digital innovation

Introduction

NextGenerationEU (NGEU) is the European Union’s 806.9 billion euros plan to address the economic and social disruption caused by the COVID-19 pandemic. Announced in May 2020 by the European Commission, the NGEU will operate as the multiannual financial framework for years 2021–2027 (1,2). As one of the European countries most severely hit by the pandemic (3,4), Italy is among the main beneficiaries of the Plan, with 191.5 billions allocated in grants and loans (5). On April 27, 2021, the Italian Parliament approved the Government’s proposal of the National Recovery and Resilience Plan (NRRP) which defines the destination and intervention of the NGEU resources (6,7). The NRRP was subsequently

confirmed by the European Commission and Council in June and July 2021. We briefly outline here some central aspects of the NRRP that bridge public law and public health, as well as their current development and implementation status. With the ‘once in a lifetime chance’ represented by the NGEU (7), Italy cannot fail the opportunity to make an ‘healthcare renaissance’ out of the NRRP.

Health in the NRRP

The strategic intervention areas identified at European level in the NGEU which are going to be addressed within the NRRP are (i) digitization and innovation, (ii) ecological transition, and (iii) social

inclusion. The NRRP recognizes the need to implement effective strategies through six different key missions, all directly or indirectly concerning health issues:

1. Digitisation, Innovation, Competitiveness, Culture
2. Green Revolution and Ecological Transition
3. Infrastructure for Sustainable Mobility
4. Education and Research
5. Inclusion and Cohesion
6. Health

Developed under the pressure of the COVID-19 crisis, the 'Health' NRRP component aims at changing the structure of the healthcare services by substantially strengthening preventive medicine interventions and efficacy. The effort is envisaged through the implementation of new public healthcare laws, full digitisation of the health systems, and substantial improvement of the equity in access to care. Two key strategies have been identified under this perspective: '*Proximity networks, structures and telemedicine for territorial healthcare assistance*' and '*Innovation, research and digitisation of the National Health System*'.

Proximity structures and telemedicine for territorial healthcare assistance

The objectives of this first strategy are the decrease of disparities in accessing healthcare services and benefitting from them, especially due to the current inadequate integration between hospital-based and community-based healthcare services. In particular, the NRRP addresses the need to strengthen the National Health System through the link with hospital-based healthcare of community structures and facilities, such as with community homes ('Case della Comunità') and community hospitals ('Ospedali di Comunità'). Within such a new organizational framework, the NRRP goals are focused on the improvement of home care, telemedicine, and e-health services.

With regard to the integration of hospital and community, new models of healthcare were already identified and structured before the pandemic in the Italian National Health System, e.g. the so called diagnostic, therapeutic and healthcare management

protocols (PDTA) (8). However, despite the implementation of several PDTA, particularly for rare and chronic diseases, their structure and application are still highly heterogeneous across the Italian regions, especially when National Plans outlining the main framework are missing (8). Consequently, an effort must be made to achieve more homogeneous and equal healthcare across the country and the different regions, independently of economic and cultural differences. For this reason, the NRRP outlines the need to change many aspects of the National Health System and primary healthcare, overcoming the geographical heterogeneity in healthcare assistance and achieving a better efficacy of the assistance yielded by these services. This challenge has been addressed in the NRRP with the objective to strengthen the intermediate assistance through the increase of "community hospitals", a structure aimed at the reduction of inappropriate access to hospital-based healthcare, such as emergency room, specialized services, and other hospital facilities. For this purpose, the key strategies of the NRRP are the allocation of resources to the enhancement of healthcare network on the territory and the healthcare digital innovations such as "telehealth" (9).

Within the framework of the strong pressure towards digital transition, this latter tool of implementation and improvement of e-health/telemedicine services is going to be fundamental to achieve this goal. It has been already convincingly demonstrated the feasibility of e-health, its effectiveness in increasing quality and easing access to healthcare (10,11), and also in somewhat favoring a cost reduction (12,13), especially when shifting from hospital-based to community-based care for chronic diseases, such as diabetes and neurodegenerative disease (14,15).

It is noteworthy to observe that the COVID-19 pandemic and the prolonged lockdowns have strongly boosted the implementation of telemedicine programs in the most recent months (16). This has been also true for the management and follow-up of several chronic diseases, including cancer (13,17-20). The establishment of lockdowns, with the decreased mobility of subjects, and the prolonged social distancing severely affected personal habits and lifestyles (21,22), and had a negative impact on human health and especially on mental health (23). In this respect, tele-psychiatry has

been an area of particular interest and relevance during the pandemic, when overall telemedicine interventions for both psychiatric patients and general population were implemented (24).

A lesson learned during the pandemic about the use of telemedicine is that a great proportion of outpatient visits of subjects with nonurgent conditions could be effectively managed with no reduction of quality of care through telemedicine facilities, e.g. e-health or mobile-health services, although the need for the implementation of logistics as well as better personnel training has been pointed out (16). However, contrasting results have been reported about the effectiveness of telehealth programs (25). In this view, the actions planned within the NRRP should provide a careful identification and assessment of the areas that may more benefit from telehealth approaches and solutions.

Innovation, research and digitisation of the National Health System

Significant resources are also being allocated by the NGEU and the NRRP itself to nourish scientific research and foster technology transfer, as well as to the NHS for the enhancement of staff training.

Closely related to the first strategy, the objectives of the second strategy aim at developing public health services capable of strengthening skills and human capital as well as to enhancing investments for digital, structural and technological resources, increasing biomedical research, and promoting the renewal and modernization of the existing technological and digital healthcare structures. Among its key interventions, the NRRP outlines the need to re-organize the national network of the Scientific Institutes for Research, Hospitalization and Healthcare (IRCCS), encompassing an improvement of their governance, a clear identification of their specific mission, and the implementation of networking activities aiming at increasing quality and competitiveness of their research output. In addition, the NRRP focuses its attention to allocate resources for the digital transition, the employment of innovative health technologies, as well as the strengthening of intensive and semi-intensive care units. The latter objective is of particularly relevance since the lack of such structures became apparent during the

most critical phases of the COVID-19 pandemic, when temporary hospitals had to be built up in Italy as occurred in several other countries (26-28).

Further improvements of the NRRP are linked to the completion and systematic use of the Personal Electronic Health Record (PEHR), and to a better delivery and monitoring capacity of the Essential Levels of Assistance (LEA) through more effective information technology tools and systems (29). For example, the implementation of PEHR already showed to have positive impact on immunization program through the increase of vaccine uptake, although mediating factors as well as digital improvements of such tools are still to be identified (30).

In addition, the NRRP recognizes the need to address at national levels the disparities in the provision of healthcare services, the lack of integration between hospital-based and community-based care as well as social services, the issue of a too long waiting time for critical interventions in many areas of the country, and eventually the limited capacity to address environmental and climate change-related health risks and to counteract them with appropriate strategies.

With regard to the use and implementation of innovative technologies, the COVID-19 pandemic has forced health professionals to develop new strategies and tools for the management of patients. A clear example can be seen in the development of several digital apps for COVID-19 triage and self-assessment (31). This kind of interventions is particularly advisable under a public health perspective, in order to limit through effective community services, the need of hospital-based care.

The NRRP Implementation

With the Decree-Laws nos. 77 and 80 the Italian Government has articulated the NRRP governance structure (32,33). This was a key issue since the power to regulate healthcare in the Italian Constitution is divided between the central State and the several Regions (34) and a failure to coordinate different government levels would have arguably led to constitutional litigation and thus hindered the NRRP implementation. In this respect, the Decree-Law no.

77 has given the Regions a significant role in the NRRP execution program by establishing a steering committee ('cabina di regia') that allows for Regional participation in several forms.

As to the NRRP current implementation status, the first Prime Minister's Secretary has recently released its first periodical review summarizing the current state of NRRP reforms in Italy (6). It bears to keep in mind that the NGEU funds are made available to each European State upon completion of the milestones and targets set forth in the detailed Annex to the Council of the European Union's Implementing Decision of July 22, 2021 (35). With regard to healthcare reforms, in 2021 it is "only" envisioned the milestone "Digital update of hospitals' technological equipment" (36), that the Prime Minister's Secretary's review describes as "ongoing". However, a positive conclusion to such a technical update should bode well for the far more demanding milestone that awaits the Italian Government and Regions in the first quarter of 2022: "Definition of a new organisational model for Territorial healthcare assistance network" (36). The reform of territorial and primary care has already generated a heated debate between the Italian Regions and primary care physicians (37,38). However, the Italian government cannot fail the opportunity for such momentous and much needed change in the Italian primary care system (39,40).

Conclusions

The Italian National Recovery and Resilience Plan has outlined the tasks for the use of NGEU resources. Most importantly, the NRRP describes the reforms that must be carried out in national and regional legislation in order to improve the Italian healthcare system. Bridging public law and public health is thus a major imperative of both the NGEU and the NRRP, and should be fully accounted and sustained by both the legal and the health sciences communities. In this paper, we summarized and discussed the rules, regulations and perspectives that are singled out in the NRRP in order to foster effective healthcare

and to reshape the Italian National Health System by improving the networking between hospital and community health centers, with an urge towards digital innovation.

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References

1. Picek O. Spillover effects from Next Generation EU. *Inter Econ* 2020; 55 (5): 325-31. <https://doi.org/10.1007/s10272-020-0923-z>.
2. Alcidi C, Gros D. Next Generation EU: A large common response to the COVID-19 crisis. *Inter Econ* 2020; 55 (4): 202-3. <https://doi.org/10.1007/s10272-020-0900-6>.
3. Vinceti M, Filippini T, Rothman KJ, et al. SARS-CoV-2 infection incidence during the first and second COVID-19 waves in Italy. *Environ Res* 2021; 197: 111097. <https://doi.org/10.1016/j.envres.2021.111097>.
4. Filippini T, Zagnoli F, Bosi M, et al. An assessment of case-fatality and infection-fatality rates of first and second COVID-19 waves in Italy. *Acta Biomed* 2021; 92 (e2021420). <https://doi.org/10.23750/abm.v92iS6.12241>.
5. European Commission. Recovery plan for Europe. 2021. https://ec.europa.eu/info/strategy/recovery-plan-europe_en. Accessed September 27, 2021.
6. National Recovery and Resilience Plan. 2021. <http://www.politicheeuropee.gov.it/media/5651/pnrr-definitivo.pdf>. Accessed September 27, 2021.
7. NextGenerationEU. Recovery plan for Europe. 2021. https://ec.europa.eu/info/strategy/recovery-plan-europe_en. Accessed September 27, 2021.
8. Piccinni C, Calabria S, Ronconi G, et al. [Facts and figures of clinical pathways in Italy: Results from the PDTA Net project.]. *Recenti Prog Med* 2019; 110 (4): 188-94. <https://doi.org/10.1701/3154.31344>.
9. Capolongo S, Gola M, Brambilla A, et al. COVID-19 and healthcare facilities: A decalogue of design strategies for resilient hospitals. *Acta Biomed* 2020; 91 (9-S): 50-60. <https://doi.org/10.23750/abm.v91i9-S.10117>.
10. Hilty DM, Ferrer DC, Parish MB, et al. The effectiveness of telemental health: A 2013 review. *Telemed J E Health* 2013; 19 (6): 444-54. <https://doi.org/10.1089/tmj.2013.0075>.

11. Benski AC, Schmidt NC, Viviano M, et al. Improving the quality of antenatal care using mobile health in Madagascar: Five-year cross-sectional study. *JMIR Mhealth Uhealth* 2020; 8 (7): e18543. <https://doi.org/10.2196/18543>.
12. de la Torre-Diez I, Lopez-Coronado M, Vaca C, et al. Cost-utility and cost-effectiveness studies of telemedicine, electronic, and mobile health systems in the literature: A systematic review. *Telemed J E Health* 2015; 21 (2): 81-5. <https://doi.org/10.1089/tmj.2014.0053>.
13. Jiang X, Ming WK, You JH. The cost-effectiveness of digital health interventions on the management of cardiovascular diseases: Systematic review. *J Med Internet Res* 2019; 21 (6): e13166. <https://doi.org/10.2196/13166>.
14. Donald M, Jackson CL, Byrnes J, et al. Community-based integrated care versus hospital outpatient care for managing patients with complex type 2 diabetes: Costing analysis. *Aust Health Rev* 2021; 45 (1): 42-50. <https://doi.org/10.1071/AH19226>.
15. De Marchi F, Contaldi E, Magistrelli L, et al. Telehealth in neurodegenerative diseases: Opportunities and challenges for patients and physicians. *Brain Sci* 2021; 11 (2): 237. <https://doi.org/10.3390/brainsci11020237>.
16. Bashshur R, Doarn CR, Frenk JM, et al. Telemedicine and the COVID-19 pandemic, lessons for the future. *Telemed J E Health* 2020; 26 (5): 571-3. <https://doi.org/10.1089/tmj.2020.29040.rb>.
17. Guarino M, Cossiga V, Fiorentino A, et al. Use of telemedicine for chronic liver disease at a single care center during the COVID-19 pandemic: Prospective observational study. *J Med Internet Res* 2020; 22 (9): e20874. <https://doi.org/10.2196/20874>.
18. Maietti E, Sanmarchi F, Palestini L, et al. The experience of patients with diabetes with the use of telemedicine and teleassistance services during the COVID-19 pandemic in Italy: Factors associated with perceived quality and willingness to continue. *Diabetes Res Clin Pract* 2021: 109047. <https://doi.org/10.1016/j.diabres.2021.109047>.
19. Shirke MM, Shaikh SA, Harky A. Implications of telemedicine in oncology during the COVID-19 pandemic. *Acta Biomed* 2020; 91 (3): e2020022. <https://doi.org/10.23750/abm.v91i3.9849>.
20. Vasta R, Moglia C, D'Ovidio F, et al. Telemedicine for patients with amyotrophic lateral sclerosis during COVID-19 pandemic: An Italian ALS referral center experience. *Amyotroph Lateral Scler Frontotemporal Degener* 2021; 22 (3-4): 308-11. <https://doi.org/10.1080/21678421.2020.1820043>.
21. Vinceti M, Filippini T, Rothman KJ, et al. Lockdown timing and efficacy in controlling COVID-19 using mobile phone tracking. *EClinicalMedicine* 2020; 25: 100457. <https://doi.org/10.1016/j.eclinm.2020.100457>.
22. Odone A, Lugo A, Amerio A, et al. COVID-19 lockdown impact on lifestyle habits of Italian adults. *Acta Biomed* 2020; 91 (9-S): 87-9. <https://doi.org/10.23750/abm.v91i9-S.10122>.
23. Amerio A, Lugo A, Stival C, et al. COVID-19 lockdown impact on mental health in a large representative sample of Italian adults. *J Affect Disord* 2021; 292: 398-404. <https://doi.org/10.1016/j.jad.2021.05.117>.
24. Amerio A, Odone A, Marzano L, et al. COVID-19: The last call for telepsychiatry. *Acta Biomed* 2020; 91 (3): ahead of print. <https://doi.org/10.23750/abm.v91i3.10337>.
25. Bitar H, Alismail S. The role of eHealth, telehealth, and telemedicine for chronic disease patients during COVID-19 pandemic: A rapid systematic review. *Digit Health* 2021; 7: 20552076211009396. <https://doi.org/10.1177/20552076211009396>.
26. Li Q, Wang L, Wang B, et al. The COVID-19-designated hospitals in China: Preparing for public health emergencies. *Emerg Microbes Infect* 2021; 10 (1): 998-1001. <https://doi.org/10.1080/22221751.2021.1931467>.
27. Sacchetto D, Raviolo M, Beltrando C, et al. COVID-19 surge capacity solutions: Our experience of converting a concert hall into a temporary hospital for mild and moderate COVID-19 patients. *Disaster Med Public Health Prep* 2020: 1-4. <https://doi.org/10.1017/dmp.2020.412>.
28. Liwanag V. FieraMilanoCity repurposed into a temporary hospital in 10 days. *ArchiExpo e-Magazine*. 2020. <https://emag.archiexpo.com/covid-19-fieramilanocity-repurposed-into-a-temporary-hospital-in-10-days/>. Accessed September 27, 2021.
29. Signorelli C, Odone A, Oradini-Alacreu A, et al. Universal Health Coverage in Italy: Lights and shades of the Italian National Health Service which celebrated its 40th anniversary. *Health Policy* 2020; 124 (1): 69-74. <https://doi.org/10.1016/j.healthpol.2019.11.002>.
30. Balzarini F, Frascella B, Oradini-Alacreu A, et al. Does the use of personal electronic health records increase vaccine uptake? A systematic review. *Vaccine* 2020; 38 (38): 5966-78. <https://doi.org/10.1016/j.vaccine.2020.05.083>.
31. Demurtas J, Tonelli R, Celotto S, et al. [COVID-Guide: An app for covid-19 triage and self-assessment]. *Recenti Prog Med* 2021; 112 (5): 387-91. <https://doi.org/10.1701/3608.35876>.
32. Decreto Legge 31 maggio 2021, n. 77.
33. Decreto Legge 9 giugno 2021, n. 80.
34. Morana D. Tutela della salute. In: Guzzetta G, Marini FS, Morana D, editors. *Le materie di competenza regionale*. Napoli: ESI; 2015. p. 583-601.
35. European Commission. Council Implementation Decision on the approval of the assessment of the recovery and resilience plan for Italy. Brussels 22.6.2021 COM(2021) 344 final. 2021/0168 (NLE). Brussels. https://eur-lex.europa.eu/resource.html?uri=cellar:a811c054-d372-11eb-895a-01aa75ed71a1.0001.02/DOC_1&format=PDF. Accessed September 27, 2021.
36. European Commission. Annex to the proposal for a Council Implementing Decision on the approval of the assessment of the recovery and resilience plan for Italy. Brussels, 22.6.2021 COM(2021) 344 final. Annex. <https://eur-lex>

- europa.eu/resource.html?uri=cellar:a811c054-d372-11eb-895a-01aa75ed71a1.0001.02/DOC_2&format=PDF. Accessed September 27, 2021.
37. Fassari L. "L'attuale profilo di Medici di famiglia e pediatri convenzionati non è più adeguato ai nuovi bisogni di assistenza. Il futuro è nelle Case della Comunità". Dalla dipendenza a nuove forme di accreditamento, ecco le proposte delle Regioni. *Quotidiano Sanità*. 2021. https://www.quotidianosanita.it/lavoro-e-professioni/articolo.php?articolo_id=98393 Accessed September 27, 2021.
38. Medici di famiglia dipendenti? L'altolà Enpam: "Riforma così com'è provoca 84 mld di danni". *Quotidiano Sanità*. 2021. https://www.quotidianosanita.it/lavoro-e-professioni/articolo.php?articolo_id=98457. Accessed September 27, 2021.
39. Garattini L, Curto A, Freemantle N. Access to primary care in Italy: time for a shake-up? *Eur J Health Econ* 2016; 17 (2): 113-6. <https://doi.org/10.1007/s10198-015-0732-7>.
40. Vedovetto A, Soriani N, Merlo E, et al. The burden of inappropriate emergency department pediatric visits: Why Italy needs an urgent reform. *Health Serv Res* 2014; 49 (4): 1290-305. <https://doi.org/10.1111/1475-6773.12161>.

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