

The meta-projects of the new community health centers, community hospitals and local operative centers for the Italian country

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Abstract. *Background and aim:* COVID-19 highlighted significant criticalities of the Italian National Healthcare System (INHS) and recently the Italian Government approved the National Recovery and Resilience Plan (NRRP) to relaunch its economy and at the same time to promote health, sustainability, and digital innovation. Mission 6 Component 1 (M6C1) of this plan aims to improve territorial healthcare services by introducing Community Health Centers (CHCs), Community Hospitals (CHs), and Local Operative Centers (LOCs). Starting from the Italian Ministerial Decree n. 77 (2022), AGENAS (National Agency for Regional Healthcare Services) and POLIMI (Politecnico di Milano) working group developed the meta-design guidelines for CHCs, CHs and LOCs' facilities to support decision-makers in defining spatial features and building performances to address functional issues. *Methods:* Starting from an international analysis of the territorial healthcare trends in terms of design and management, the meta-projects of these facilities have been elicited through a detailed analysis of the national and regional regulations and their requirements for CHCs, CHs and LOCs (or similar ones), as well as by the requests listed in MD 77 (2022). *Results:* The regulatory instructions and scientific indications collected through the literature have been translated into spatial and functional layouts. The services have been organized by homogeneous macro-areas and defined in a synoptic framework which shows the performance approach and their features. Each macro-area, sorted by type of functions, has been subdivided into a list of all its specific spatial units. *Conclusions:* The study conducted aims at supporting the planning of these healthcare facilities in relation to the catchment area and their sizing. It is essential to evaluate the feasibility of establishing the facilities within existing hospitals and ensuring a sustainable approach in building these infrastructures. (www.actabiomedica.it)

Key words: Meta-design, National Recovery and Resilience Plan (NRRP), MD 77/2022, community health center, community hospital, local operative center, territorial healthcare.

Introduction

The COVID-19 pandemic has had a profound impact on the global community, shedding light on significant weaknesses in healthcare systems worldwide (1). Starting from the lesson learnt, healthcare and social-health facilities should respond effectively

and resiliently even in emergencies or calamitous event, as they are responsible for the protection and promotion of public health. However, the COVID-19 pandemic has exposed the inadequacy of the current healthcare facilities and the hospital-centric healthcare models, which were unable to quickly adapt to emerging management and needs (2).

In addition, the pandemic has revealed the gaps in the NHS and the regional health services, including the lack of system flexibility and architecture, reduced ICU (Intensive Care Unit) beds, unpreparedness for an emergency scenario, and most notably, the absence of a widespread territorial social-health network close to the citizen to support all non-urgent services (1,3).

In response, the Italian Government has approved the National Recovery and Resilience Plan (NRRP) to relaunch its economy and promote health, as well as sustainability and digital innovation. The NRRP is a part of the European Union program known as “Next Generation EU” (NGEU), which provides funding for investments and reforms to accelerate the ecological and digital transition, improving worker training, and achieving equity across gender, territory generations. The Recovery Fund of 750 billion euros assigns to the Italian country a total of 191.5 billion euros (4).

The NRRP represents the opportunity for planning the investments and reforms that Italy expects to implement by 2026. The plan is divided into six Missions: 1) Digitization, innovation, competitiveness, culture, and tourism; 2) Green revolution and ecological transition; 3) Infrastructures for sustainable mobility; 4) Education and research; 5) Inclusion and cohesion; 6) Health, each of which is characterized by Components (in total they are 16), which are in turn divided into Investments with the corresponding amount allocated (4).

Within Mission 6 “Health” - Component 1 (M6C1) “*Proximity networks, intermediate structures and telemedicine for territorial healthcare assistance*” to which 7 billion euros have been allocated, three lines have been identified of investment to be implemented by mid-2026 (4).

The general objective of the Mission 6 is to create a new territorial medicine by creating new healthcare facilities (around 1.350 Community Health Centers - CHCs, about 400 Community Hospitals - CHs and around 600 Local Operative Centers - LOCs), as reference points for the response to health and social care needs for the community (5-8). The integration between different healthcare, social-health, and social-welfare facilities in an area is necessary to ensure a coordinated and continuous response to the needs of the population and the uniformity of assistance levels (9,10).

For the implementation of these objectives, national support decrees have been subsequently issued,

specifically Ministerial Decree (MD) n. 77 (2022) “*Regulation containing the definition of models and standards for the development of territorial assistance in the National Health Service*” (5).

Starting from the previous CHC typology (well-known as “Case della Salute”), these multi-purpose healthcare facilities are designed to provide citizens with basic levels of social-health assistance, including prevention, treatment, and rehabilitation, within a single assistance network with the hospital system (11). In fact, these structures represent the points for primary care with features of care extension and integrate the hospital system characterized by care intensity (12).

The primary goal of healthcare architectures is to provide care for patients, from the moment of their admission, through citizens’ welcoming, the collaboration between professionals, sharing of care pathways, autonomy, responsibility professional skills and the enhancement of competences, also with the aim of reducing inappropriate hospital admissions.

Functional integration among healthcare services providers also allows for more efficient use of human and professional resources to ensure the success of these facilities (13).

With the changes in territorial medicine and the establishment of new healthcare facilities in Italy, it becomes a priority to define the design and the functional indications for the correct and efficient construction of CHCs, CHs and LOCs.

Therefore, starting from lack of design guidelines for the application of the MD 77/2022, this paper aims to define the meta-design of the new CHCs, CHs and LOCs in Italy. Specifically, the meta-design synthesizes the relevant organizational models, the existing standards and the main issues connected to the M6C1 of the NRRP; it defines functional schemes, proximity relationships and design indications relating to CHCs, CHs and LOCs, considered in a broader and more integrated perspective for the enhancement of territorial medicine (14).

The application of a meta-design for the entire national territory has the scope of guaranteeing shared recommendations and the adoption of a uniform approach, for an easy identification of the buildings. The meta-design follows a performance requirement approach, which defines the typological, functional, and technological features, according to the activities that

must be carried out inside facilities and the typical priority objectives of the building sector.

The project will prioritize efficiency of healthcare services, inclusion, and well-being of all users and towards sustainability and climate resilience. It will also comply with the provisions of the main national and international reference addresses (Agenda 2030 for Sustainable Development and the related 17 Objectives (SDGs), the European Green Deal, the Urban Health Rome Declaration, etc.), as well as the other missions from NRRP, for example Mission 1 “Digitalization and innovation”, Mission 2 “Green revolution and ecological transition” or Mission 5 “Cohesion and inclusion” (6-8).

Therefore, starting from these premises, the paper aims at presenting the outcomes of the research team coordinated by Agenas (the National Agency for Regional Healthcare Services, a non-economic public body that supports the Ministry of Health for the regional healthcare services through research, monitoring, assessment, training, and innovation) and POLIMI (Design & Health Lab., Dept. Architecture, Built environment and Construction engineering, Politecnico di Milano). Starting from the contents of MD 77 (2022) and the analysis of the design and organizational trends of these facilities at the international level (15), the general scope of the meta-design is to support the decision-makers in defining the spatial features and the building performances to be guaranteed responding to functional issues.

Methodology

The definition of the meta-design implies an in-depth analysis of the provided services and internal organization models provided by Community Health Centers (CHCs), Community Hospitals (CHs), and Local Operative Centers (LOCs). The research team adopted a methodological path that focused on analyzing international case studies as well as national and regional norms and regulations related to CHCs, CHs, and LOCs (15). This analysis helped to find, collect, and compare the accreditation requirements of every Italian region, defining the minimum quality standards of territorial healthcare facilities; in addition, it permitted to identify similarities and

differences between the requests of each local health authority (16-18).

The accreditation requirements were determined within the Italian Legislative Decree of 30th December 1992 which introduces a competitive mechanism between public and private facilities to guarantee only buildings capable of ensuring quality in the services provided. Furthermore, since two (CHCs and LOCs) of the three healthcare facilities introduced by the NRRP are completely new in the Italian peninsula, this analysis permitted to identify which regions had already issued their own legislation containing these requirements.

In addition, starting from MD 77 (2022) and the current national mission about the renovation of territorial healthcare buildings (19), it was possible to elaborate an appropriate building program with the most significant layouts. This required the upstream articulation of a synoptic framework about homogeneous macro-areas explained by their spatial, dimensional, functional, and relational characteristics considering a performance approach, starting from the analysis conducted (16). These various macro-areas have been subdivided into typology of services provided (social care, integrated home treatment, continuing care, etc.) and subsequently translated in functional healthcare and non-healthcare areas specifying every characterized spatial unit (individual environment unit) (6-8), which could be:

- operative spatial units, which characterize the functional area and the services to be provided;
- spatial units for related and support services, i.e., the rooms that are useful for carrying out the functions such as deposits, work rooms, etc., which may be in common with other functional areas of the facility;
- space dedicated to the users and workers, which can be shared with other functional areas, i.e., waiting areas, relaxation room, etc.

The functions have been divided into mandatory and optional according to the following criteria:

- “Compulsory” as indicated “Compulsory” in Table 4 of MD 77 (2022);
- “Optional”, if considered “Strongly Recommended”, “Recommended” and “Optional” by Table 4 of DM 77 (2022).

This means that each facility will provide the inclusion of the mandatory functions and may provide for the presence of additional/optional areas according to the indications and recommendations by the Local Health Authority (20), for instance, as the case of Regione Lombardia (21). Where the MD 77 (2022) does not define any specific indication on the functional area (i.e., regarding the general services and logistics), the team referred also to the data analysis of the comparison of the national and regional regulations.

In the following section, the research team discusses the functional and design issue related to Community Health Centers, Community Hospitals and Local Operative Centers.

Outcomes of the research activity: from the functional issues of MD 77 to the spatial features of the meta-projects

COMMUNITY HEALTH CENTERS (CHCs)

MD 77/2022 defines the *Community Health Center* as “the physical and easily identifiable place to which citizens can access for healthcare and social care needs with a health value” (5). In general, the CHC represents the organizational model that locally guarantees assistance for the target population. It must be an easily recognizable and accessible facility, for supporting the citizens within the NHS with the set of essential levels of social and medical assistance (14).

Starting from MD 77, based on the user profiles and the activities that are provided, the organization of the CHC is divided into functional macro-areas, where the spatial units are grouped by homogeneous functions. The research team classified the services into (6):

- SPECIALIZED OUTPATIENT CARE macro-area which hosts all health services such as diagnosis and treatment services with the presence of basic diagnostics, blood sampling area, outpatient and specialist services;
- PRIMARY CARE macro-area which includes all the spaces for Group Medicine, including General Practitioners (GPs), Primary Care Pediatricians (PCP) and Family or Community Nurses, etc.;

- PROXIMITY CARE macro-area which hosts medical assistance (i.e. 24/7), nursing services, as well as a counter and offices for social and health services such as the presence of a social worker, prevention, home care, etc.;
- GENERAL SERVICES AND LOGISTICS macro-area which includes all the non-health functions that allow the facility to work, such as welcoming areas and spaces for healthcare staff, logistics areas and technical rooms. This macro-area can be divided into:
 - welcoming services for users (hall, reception, administrative area, etc.);
 - services for healthcare and non-medical staff (changing rooms, relaxation areas, coordinator office, etc.);
 - logistic services (archives, storages, etc.) and technical rooms (technical rooms, Air Handling Units - AHUs, etc.).

The CHCs can be structured in different ways depending on the services provided (compulsory and optional ones), the related spaces, the context, and its catchment area.

Consequently, the complexity of the facility varies according to the presence and type of services provided, as well as their dimensions. The characteristic indicator of the typology is the degree of complexity, which means the number and type of services provided. In the definition of the CHC, there are two levels of complexity (Hub and Spoke) divided into:

- the Hub, that provides primary care services, specialist and diagnostic activities;
- the Spoke, that provides just primary care services.

The research team elaborated schematic-functional diagrams both for the Hub and Spoke. In both cases, the diagrams refer exclusively to the Functional Areas considered mandatory (refer to the section “*Classification method of the macro-areas, functional area and spatial units*”).

In the case of a CHC within an existing healthcare building or integrated with a CH and/or LOC, various spaces related to the General and Logistic Services macro-area (the grey ones) can be shared.

As Figure 1 and Table 1 highlight, the main differences between Hub and Spoke are precisely due to the functions and the related spaces, and as a consequence of the expected volume of activities and by their dimensioning; indeed, it is expected that the Hub ones are around 800/900 sqm (with 24 operative rooms), instead the Spoke ones about 500/600 sqm (with 14 operative rooms).

The research team gave rise to detailed diagrams that suggest the general functional layouts of the Hub and Spoke typologies, as Figures 2 and 3 show.

Considering the recent COVID-19 pandemic, the CHCs Hub, must be able to differentiate user flows (i.e., COVID / not-COVID) (1), and for safety and efficiency needs (e.g., compartmentalization of the facility during the night and/or weekend, etc.), it is suggested to guarantee secondary accesses such as:

- independent access to the facilities for 24/7 medical assistance (night access with a waiting room);
- connections with outdoor areas to ensure, in case of emergency, possible additions with pre-fabricated structures.

For further information refer to the report published by Agenas (6).

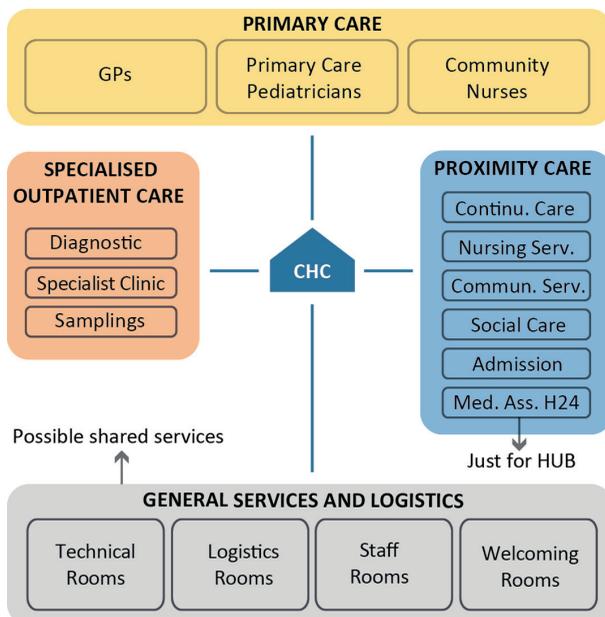


Figure 1. Functional diagram of the CHC Hub and Spoke.

COMMUNITY HOSPITALS (CHs)

Community Hospitals are intermediate health-care facilities between home care and hospitals, and they aim at avoiding inappropriate hospitalizations by better supporting the process of discharge from hospitalization structures. Moreover, they guarantee assistance to patients with complex conditions, overcoming the specificity for single disease/condition (22).

During the pandemic emergency, patients affected by COVID-19 occupied most of the hospital centers, whose wards risked collapsing. For this reason, hospitals ran out of room for the treatment of the so-called low and medium-intensity care (it is considered “medium-intensity” care the hospitalizations for acute cases, surgery, and maternal-child interventions. “Low intensity” treatments, on the other hand, concern post-acute hospitalizations and outpatient and day services) (MD 77, 2022) (5).

The CH is composed of an inpatient ward with 15-20 beds, expandable up to a maximum of two inpatient wards, for a total of up to 40 beds (5).

Starting from MD 77 (2022), specifically from the list of CH functions, the services have been classified according to 2 homogeneous macro-areas (7):

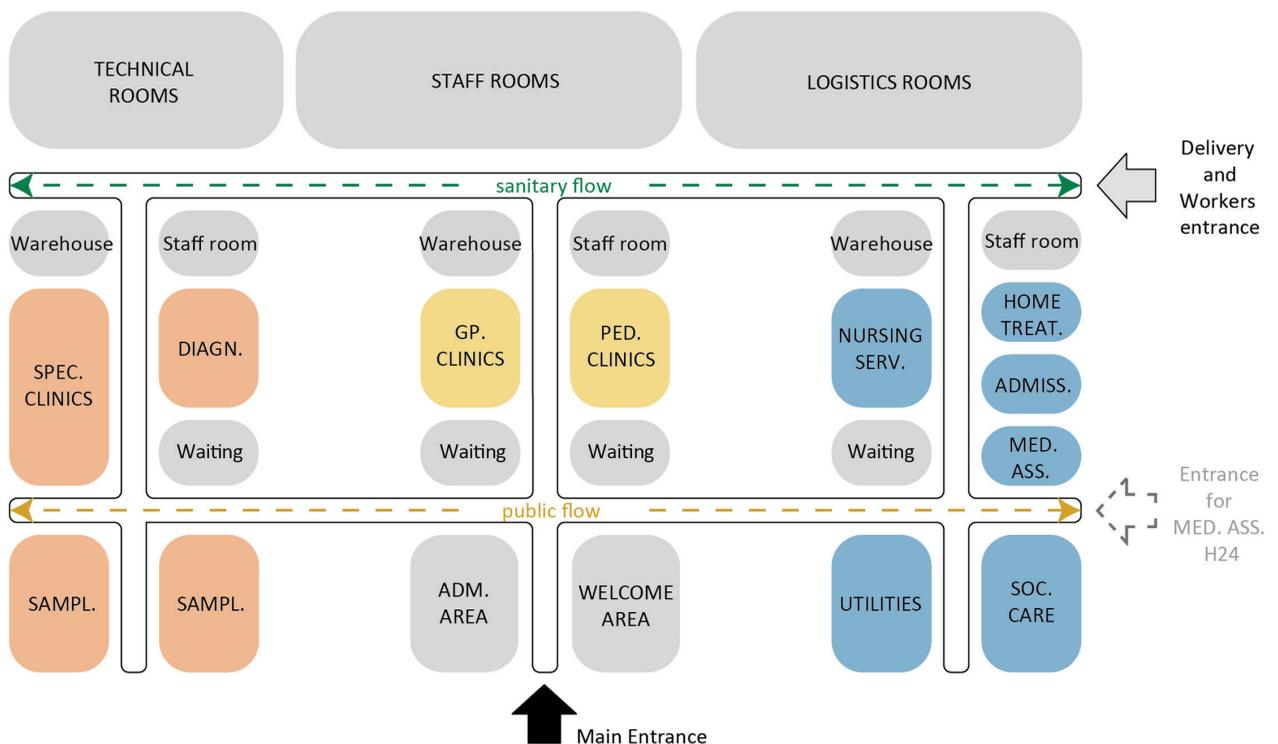
- **INPATIENT WARD** macro-area which hosts all inpatient services such as hospitalizations, outpatient clinics and rehabilitation areas;
- **GENERAL SERVICES AND LOGISTICS** macro-area which includes all the non-health functions that allow the facility to work, such as users’ welcoming and healthcare staffs spaces, logistics areas and technical rooms. This macro-area can be divided into:
 - welcoming services for users (reception and administrative area, etc.);
 - services for healthcare and non-medical staff (changing rooms, relaxation areas, coordinator office, etc.);
 - logistic services (archives, storages, etc.) and technical rooms (technical rooms, technological areas, AHU rooms, etc.).

The team elaborated a schematic-functional diagram which sketched exclusively the Functional Areas considered compulsory (refer to the section

Table 1. List of Macro-areas and Functional Areas considered mandatory and optional for the CHC Hub and Spoke.

CHC functional units		CHC specification		
MACRO-AREA	FUNCTIONAL AREAS	METADESIGN		
		HUB	SPOKE	
SPECIALIZED OUTPATIENT CARE	DIAGNOSTICS			
	<i>Diagnosis and treatment services</i>	BASIC DIAGNOSTICS (retinography, spirometer, echograph, etc.).	Compulsory	Optional
	SAMPLING AREA			
	<i>Sampling area and point of care</i>	SAMPLINGS	Compulsory	Optional
	SPECIALIST CLINICS			
	<i>Specialist outpatient services</i>	SPECIALIST OUTPATIENT AREA (diabetologist, cardiologist, etc.).	Compulsory	Compulsory
PRIMARY CARE	PRIMARY CARE AREA			
		MEDICAL CLINIC for General Practitioners (GPs)	Compulsory	Compulsory
		MEDICAL CLINIC for Primary care Pediatricians	Compulsory	Compulsory
		MEDICAL CLINIC for Family or Community Nurses	Compulsory	Compulsory
PROXIMITY CARE	NURSING SERVICES			
		NURSING CLINICS	Compulsory	Compulsory
	H24 / H12 MEDICAL ASSISTANCE			
	<i>Medical Assistance</i>	H24 / H12 MEDICAL ASSISTANCE	Compulsory (H24)	Compulsory (H12)
	ADMISSION SERVICES			
		ADMISSION	Compulsory	Compulsory
	INTEGRATION with SOCIAL CARE			
		Spaces for SOCIAL CARE	Compulsory	Compulsory
	HOME TREATMENT			
		INTEGRATED HOME TREATMENT	Compulsory	Compulsory
		CONTINUING CARE	Compulsory	/
	COMMUNITY SERVICES			
	MULTI-PURPOSE MEETING ROOM	Compulsory	Compulsory	
GENERAL SERVICES AND LOGISTICS	GENERAL SERVICES AREA			
	<i>Urban services for external users and healthcare staff</i>	WELCOMING AREA	Compulsory	Compulsory
		STAFF ROOMS	Compulsory	Compulsory
		ADMINISTRATIVE AREA	Compulsory	Compulsory

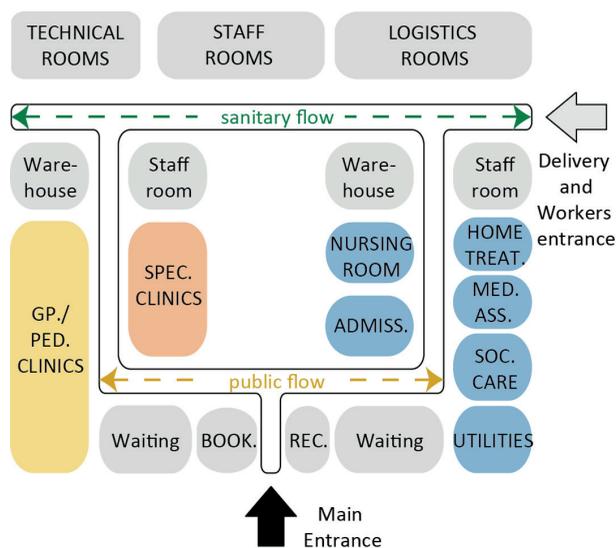
CHC functional units		CHC specification		
MACRO-AREA	FUNCTIONAL AREAS	METADESIGN		
		HUB	SPOKE	
	LOGISTICS AREA			
	<i>Logistics for social-health facility operation</i>	ARCHIVES – WAREHOUSES – STORAGES	Compulsory	Compulsory
		INFO POINT and TELEMEDICINE	Compulsory	Compulsory
		RECYCLING CENTER	Compulsory	Compulsory
		CLEANING AREA	Compulsory	Compulsory
	TECHNICAL ROOMS AREA			
<i>CTs, gas stations, connections, sub-stations, etc.</i>	TECHNICAL ROOMS, TECHNOLOGICAL CENTRE, AHUs, etc.	/	/	



LEGEND OF THE MACRO AREAS



Figure 2. Layout of the CHC Hub with the Functional Areas considered mandatory.



LEGEND OF THE MACRO AREAS



Figure 3. Layout of the CHC Spoke with the Functional Areas considered mandatory.

“Classification method of the macro-areas, functional area and spatial units”).

In the case of a CH within an existing healthcare building or integrated with a CHC and/or LOC, various spaces related to the General Services and Logistics macro-area (welcoming area, storage areas, staff changing rooms, technological areas, etc.; the grey ones) can be shared.

The dimension of the CH is estimated at around 1000 sqm for 20 inpatient beds, although this value is strongly related to the organizational typology, to its location (inside an existing building or integrated with a CHC), as well as to the number of beds. Therefore, it can vary according to the results of the preliminary investigations at the territorial and local scales, also according to the indications that the different regions will suggest.

Referring to Figure 4 and Table 2, the team drew up a schematic-functional diagram for the CHs.

In relation to the main flows, the presence of a single central and recognizable public entrance is preferred for guiding the users. The addition of possible secondary accesses (healthcare staff, goods, etc.) can be useful - in the case of need or emergency- for

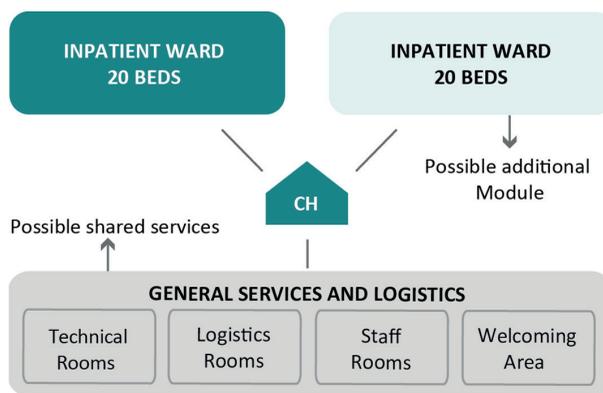


Figure 4. Functional diagram of the CH.

supporting the management of separate flows (i.e., refer to COVID-19 experience), as Figure 5 shows (1).

If the CH is within a healthcare facility with multiple medical services, it is suggested to guarantee shared accesses to the hosting building, but which can be separated in case of emergency, as well as additional beds (18).

At the distribution level, the positioning of the horizontal and/or vertical paths plays a strategic role, and it is preferable, where possible, to guarantee differentiated paths for the public and healthcare ones, through two corridors, and in the case of structures with vertical development, with differentiated elevators.

For further information refer to the report published by Agenas (7).

LOCAL OPERATIVE CENTRES (LOCs)

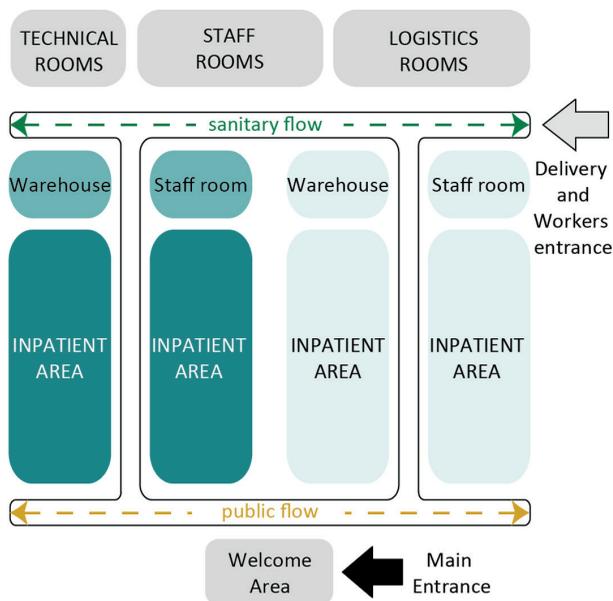
The LOCs become a new innovative organizational model of the center which performs coordination functions both in taking charge of the citizen and in the relationship between services and the healthcare professionals involved in the various healthcare settings (territorial medicine, healthcare and social activities, hospital activities, etc.) (5).

At a national level, there are already Operative Centers for emergency management, which will therefore be joined by the LOCs, for even more widespread coverage of the territory and a service that is closer and more appropriate to the end user (23,24).

According to MD 77 and various studies conducted by the Scientific Community, the functions

Table 2. List of Macro-areas and Functional Areas considered mandatory and optional for the CH.

Community Hospital Functional Units		Community Hospital specification
MACRO-AREA	FUNCTIONAL AREAS	METADESIGN
IN-PATIENT WARD	INPATIENT AREA	
	<i>Low-care in-patient services</i> INPATIENT WARD	Compulsory
GENERAL AND LOGISTICAL SERVICES	GENERAL SERVICES AREA	
	USER WELCOMING AREA	Compulsory (but it can be shared)
	HEALTHCARE STAFF WELCOMING AREA	Compulsory (but it can be shared)
	LOGISTICS AREA	
	<i>Logistics for healthcare facility operation</i> ARCHIVES - WAREHOUSES - STORAGES	Compulsory (but it can be shared)
	RECYCLING CENTER	Compulsory (but it can be shared)
	CLEANING AREA	Compulsory (but it can be shared)
	KITCHEN	Optional
	LAUNDRY	Optional
	TECHNICAL ROOM AREA	
<i>CTs, gas stations, connections, sub-stations, etc.</i> TECHNICAL ROOMS, TECHNOLOGICAL CENTRE, AHUs, etc.	Compulsory (but it can be shared)	



LEGEND OF THE MACRO AREAS

- M. GEN. SERV. and LOG. (light grey rounded rectangle)
- M. HOSPITALISATION (teal rounded rectangle)

Figure 5. Layout of the CH with the Functional Areas considered mandatory.

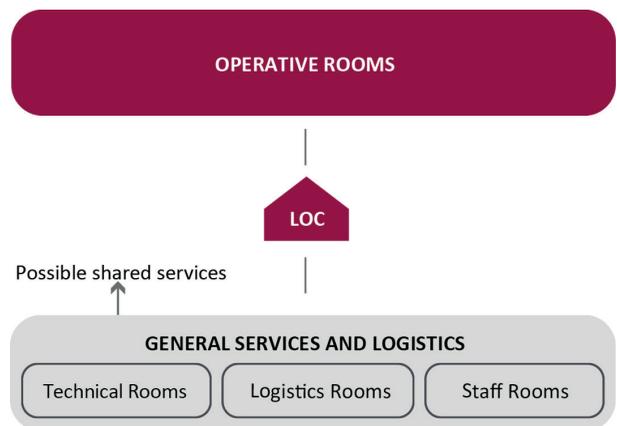


Figure 6. Functional diagram of the LOC.

have been classified according to 2 macro-areas (8), as Figure 6 shows:

- OPERATIVE macro-area which hosts the spaces that include the operative rooms and the related executive and administrative offices;

Table 3. List of Macro-areas and Functional Areas considered mandatory and optional for the LOC.

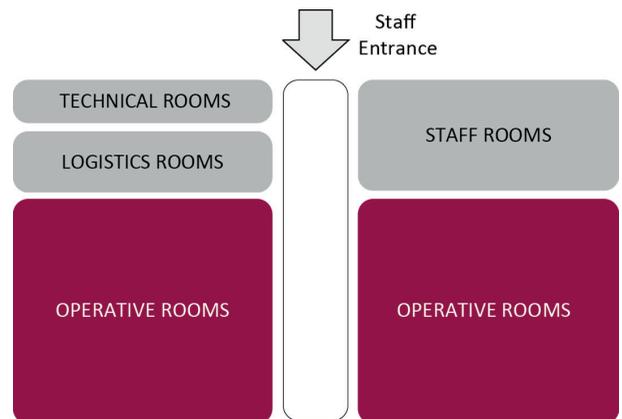
LOC Functional Units		LOC specification	
MACRO-AREA	FUNCTIONAL AREAS	METADESIGN	
OPERATIVE CENTER	OPERATIVE CENTER		
	<i>Operative area with workstations</i>	Operative rooms, premises for technological equipment, management, and administrative offices, etc.	
GENERAL SERVICES AND LOGISTICS	GENERAL SERVICES AREA		
	<i>Welcoming services for users and healthcare staff</i>	HEALTHCARE STAFF WELCOMING	
	LOGISTICS		
	<i>Logistics for healthcare facility operation</i>	ARCHIVES - WAREHOUSES - STORAGES	Compulsory (but it can be shared)
		CLEANING AREA	Compulsory (but it can be shared)
TECHNICAL ROOM AREA			
	TECHNICAL ROOMS, TECHNOLOGICAL AREA, AHUs, etc.	Compulsory (but it can be shared)	

- GENERAL SERVICES AND LOGISTICS macro-area which includes the non-health functions that allow the structure to work, such as logistics areas and technical rooms. This macro-area can be divided into:
 - services for healthcare and non-medical staff (changing rooms, relaxation areas, coordinator office, etc.);
 - logistic services (archives, storages, etc.) and technical rooms (technical rooms, technological areas, etc.).

The team elaborated a schematic-functional diagram which sketched exclusively the Functional Areas considered mandatory (refer to the section “*Classification method of the macro-areas, functional area and spatial units*”), as Table 3 and Figure 7 show.

In the case of a LOC within an existing healthcare building or integrated with a CHC and/or CH, various spaces related to the General Services and Logistic macro-area (storage areas, staff changing rooms, technological areas, etc.; the grey ones) can be shared.

In general, the dimensioning of the LOC can vary according to the type of healthcare facility in which it is located and its organization. Therefore, it will vary according to the results of the preliminary investigations at the territorial and local scales.



LEGEND OF THE MACRO AREAS

- M. GEN. SERV. and LOG. (grey box)
- M. OPERATIVE ROOMS (maroon box)

Figure 7. Layout of the LOC with the Functional Areas considered mandatory.

As the document published by VV.AA. (2022), for each operator a surface of no less than 7 sqm is considered (23).

Therefore, the minimum dimension of a LOC could be approximately 150 sqm.

If the LOC is in an autonomous facility, one single access will suffice; otherwise, if the LOC is located within a healthcare facility with multiple services, it is

suggested to guarantee shared accesses to the hosting building.

For further information refer to the report published by Agenas (8).

Integrated healthcare facilities for the Community

As several institutions and scholars suggest, these healthcare facilities should be localized in an integrated structure (11,17). In that sense, several macro-areas can be in common among the multiple services (6-8,17,18): in fact, most of the spaces associated with the macro-areas related to General Services and Logistics should be sized to host efficiently the services. For this reason, the working group developed an overall scheme of the three healthcare facilities integrated in the same building (Figure 8) (6-8).

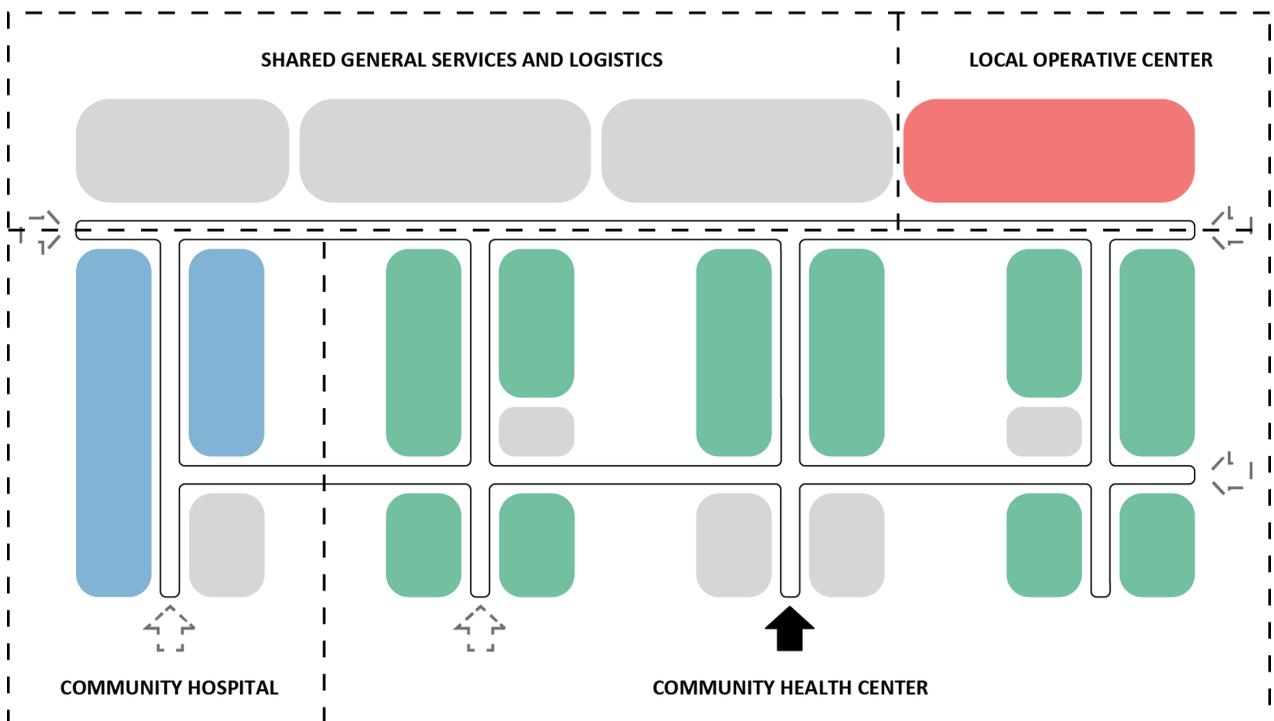
The localization of the medical functions has been defined to guarantee proximity between the inpatient ward of CH and the specialist macro-area

of the CHC (specialist outpatient clinics, diagnostic area, etc.). The diagram of the functional and spatial relationships of the integrated facilities with CH, CHC and LOC, with the general and logistic services is reported below.

Conclusions

Referring to the research work, currently the regional healthcare organizations are applying the contents of the meta-projects. In the next few years, we will see the outcomes and the various applications according to the health and social needs of the communities. In fact, these new territorial facilities will be particularly effective in delivering health services, especially if they will be able to reach the socio-health demand of each target population.

Regarding the NRRP, additional actions need to be taken in consideration for improving the efficiency



LEGEND OF THE MACRO AREAS



Figure 8. Overall diagram of a healthcare facility that hosts CHC, CH and LOC.

of these architecture starting with their human impact on the environment and the reuse of existing facilities.

Sustainability

Designing spaces for CHCs, CHs and LOCs requires collaboration with professionals from different sectors to incorporate the needs of both health and social care services and new building design methods focused on sustainability, climate resilience, efficiency, flexibility, etc. (25). When designing healthcare architecture, the needs of all users, including patients, healthcare professionals, visitors, and caregivers, must be taken into account. Additionally, emerging and urgent needs related to sustainability and new lifestyles resulting from the ongoing demographic and epidemiological changes, along with the Covid-19 pandemic, must be considered.

The construction sector has the highest environmental impact, resulting in the consumption of land, high energy consumption, emissions into the atmosphere, production of waste, and an increasing demand for resources (26). These effects have altered the environmental context in which we live, leading to a rise in risk factors for public health (27). Therefore, the planning and design of the new structures for territorial medicine should set different strategic objectives that can be measured through specific performance indicators. The general objectives applicable to the buildings dedicated to the territorial health network can be divided into the three macro-areas: Social and Urban, Environmental and Climatic, and Architectural-Functional (6-8).

Localization of the territorial medicine facilities

The strategic programming of territorial medicine facilities mainly involves managing relationships and functional interconnections between hospital and territorial structures, as well as health and social activities, to ensure continuity and proper care (19). Additionally, it involves determining the location of the facility on the territory and the type of service based on complexity (28, 29).

As stated by MD77, the facilities can vary depending on local and geographical features, and services

must be organized according to healthcare needs and the reference catchment area (11). Furthermore, functions can vary based on their level of pre-existence in the area and strategic choices defined in advance for the services to be provided (30-32).

In conclusion, healthcare needs in the catchment area and accessibility features are analyzed along with the natural and anthropic characteristics of the physical territory, particularly contexts where CHCs, CHs and LOCs serve multiple urban areas. Therefore, these facilities must be located in areas that guarantee proper accessibility and usability of the structure (33,34).

Reuse of existing buildings or new construction ones

When planning and designing structures for territorial medicine facilities, the location and sizing of the buildings are crucial factors that must be taken into consideration. This includes evaluating whether the structures can be located within hospital centers or already existing healthcare buildings. As well as the sizing with respect to the reference area, the presence and level of services provided are crucial to be considered (35,36).

Among the particularly influential factors, in fact, there is the location of the individual or integrated structures, evaluating the possibility of locating these structures within hospital centers or already operative healthcare buildings (buildings and/or portions of the structure) within of existing buildings or with a new construction (37).

This choice can be evaluated in relation to the layouts of existing buildings and/or the plots of land availability where such architecture can be inserted. It is important to conduct preliminary analyses at both the territorial and local scales to determine the most suitable location for an integrated structure (11,38).

In general, good practices provides that, where disused structures are available, repurposing them can be the best solution for urban regeneration, as it reduces the impact on the environment and enhance the existing built heritage (39). In fact, it is well known that abandoned built heritage is one of the most precious assets of Italian country and a hard challenge for cities. It is evident that such a heritage can represent a considerable resource.

In this macro-area, the number of abandoned hospital facilities is decisive (35). The reuse of abandoned hospital buildings represents an extremely complex case in the field of the recovery of disbanded buildings due to the architectural features that distinguish these very large buildings.

Their physical conformation and location are some of the critical points of the reconversion processes and their contemporary adaptation is more compatible with low-care functions, social services, hospitality and/or offices (very common solutions in recovery processes). In relation to the programming of territorial medicine facilities, the adaptive reuse of existing structures could be strategic (35). It permits to take into consideration disused structures that previously did not host medical functions, since the services of the CHCs, CHs and LOCs are low-medium care complexity.

Ethic Committee: not necessary

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