How Architecture promote Right to Health in Hospital

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Abstract

In the last decades both care and hospital have faced intense transformations. Hospital is not only called to assure quality of care in order to remove or reduce a condition of disease, but it has to answer to new social needs to provide citizens' health rights. Hospital have also become a complex structure, connected to the city and territory, where the traditional health functions are developed to promote values that underlie the community, such as solidarity, equity, participation. These values come true through social interactions that occur in hospital spaces and they are the condition of the effective enjoyments of rights. The aim of this paper is to highlight as architecture contributes to promote effective enjoyment of social rights in hospital care.

In order to face this study public spaces in hospital represent the most interesting sphere because they are the primary welcoming spaces for patients, visitors, citizens and at the same time they are the primary space to address the users towards the hospital activities of care.

The relationship among social right, social relations and space can be study only with the contribution of different disciplines: architecture, law and social science. Thus the interdisciplinary approach is a fundamental requirement and represents the added value of the research.

Since the focus of the research on the 'relation-based approach' as new paradigm of right to health, we decided to investigate how space affects the experience of patient in public spaces. Research methodology consists of a survey-based approach to collect information on aspects of the 'relations', analysing case studies of hospital buildings. We combined spatial analysis of hospital layout with observations of user behaviour. The direct comparison between use pattern and spatial characteristics led up to identify two results: a set of interdisciplinary meaningful topic for interrelation between space and rights; a set of spatial indicators for each meaningful topic.

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The explanation work of data produced with case studies analysis leaded to collect them in a summary tool which includes the key topic in enjoyment of right to health.

The most important innovative contribution which improves on knowledge consist of making evident that environment contributes to enjoyment of rights and showing how architecture can support right to health.

Keywords: Hospital assets, Social needs, Health rights, Spatial Layout, Hospital public spaces

1. Introduction

The aim of this paper is to highlight as architecture contributes to promote effective enjoyment of social rights in health field and especially in hospital care.

We approach this theme with a new interdisciplinary point of view aimed at addressing how hospital building can meet social needs of people, with specific emphasis on right to health in public spaces. From a legal standpoint, the right to health is a highly social and relational right whose one of the most important variables is represented by the spatial-organizational aspect. How space supports or prevents the enjoyment of right to health? We suggest that configurational factors of spatial layout play a key role together with the consolidated environmental elements (Evans, 2003; Ulrich et al., 2008). Configuration factors have to do with the set of geometrical interrelated relations in a spatial layout.

The relationship among social rights, social relations and space can be study only with the contribution of different disciplines: architecture, law and social science. Thus the interdisciplinary approach is a requirement to face this theme and represents the added value of the research since it can provide decision-making processes with a more comprehensive vision of the existing problems and possible prospects.

As a result of a number of factors we are facing profound changes in care, which therefore lead us to also re-consider architecture and its value.

In the last decades hospital too has faced intense transformations. From one hand hospital is not only called to assure quality of care in order to remove or reduce a condition of disease, but it has to answer to new social needs to provide citizens' health rights. These needs are seen within an integrated concept of health as a "state of optimal physical, mental and social well-being"[4]. Some new social needs are related to easy access to care, promotion of the social respect culture, attention to doctors-patients relation, relations involving caregivers-doctors-patients.

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[4] In some way this definition of health rights involves the Vision of World Health Organization (WHO):"Health is a state of optimal physical, mental and social well-being, and not only the absence of disease".

On the other hand hospital have become a complex structure, connected to the city and territory, where the traditional health functions are developed searching levels of excellence to promote values that underlie the community, such as solidarity, equity, participation. These values come true through social interactions that occur in hospital spaces and they are the condition of the effective enjoyments of rights.

Therefore we can talk about the way in which space is lived, and the needs of those who live in it. The physical environment is a key factor. In particular space is a significant element behind success for the quality of life of both patients and staff, because it concerns social relations. Therefore, architectural decisions behind space dynamics play a critical role.

The hospital spaces that we define 'public' -such as spaces of interface, welcoming, waiting, where people meet, and not directly involved by care activities - have assumed a particular meaning because they are the places where new social needs occur and they are the connection between health performance and city.

This paper is structured in three part: a first description of background around which we are moving that deal with the role of public spaces in hospital transformation process and the review of State of the Art; a second part that shows the methodology used and the analysis conducted on case studies with a paragraph concerning the relevance of this method in relation to the purpose; a third part with a short description of the results with an in depth analysis of a requisite and the final discussion.

1.1 The idea of public spaces in hospital

The theme of public spaces is strongly connected to the role of the hospital within cities and local areas, to the hospital as service for the community and humanisation of care. Urbanity and Socialisation. The first concept underlines the importance for a new hospital to be integrated to the urban weave in a multi-level built environment. The focus is on the role of the hospital as a catalyst of re-qualification, of re-generation and development of cities, abandoning a concept of hospital as a separated place from the city-life: hospital as 'civic architecture' (Curtis et al., 2009).

Socialisation entails, in a complementary way to Urbanity, the concept of solidarity and belonging to the community, thus an open hospital that holds areas dedicated to social and cultural activities that can be used, for example, by voluntary services. The modern/ hospital tends to open itself to and include new kind of public spaces.

Previously the term 'public spaces' overall referred to the connectives of entrance of the hospital, the area of distribution that precedes the hospital functions. Currently this term gains a much wider meaning. The hospital entrance becomes an articulated and complex space, the conformation of the hospital layout gets set to receive big halls, proper streets, parks, capacious loggias and covered squares. These areas modify not just the hospital physiognomy but represent spaces that are functionally new so that they can be called spaces of interface or hybrid spaces (Torricelli et al., 2010).

They embed, indeed, a mixed of activities from information and communication of the reception to waiting areas and rest stop zones. These hybrid spaces are the primary welcoming spaces for patients, visitors, citizens and at the same time they are the primary space to address the users towards the hospital activities of care.

The introduction of public spaces within the hospital is one of the major factors that have been shaping the contemporary hospital (Fiset, 2006).The growth of public spaces in hospitals began in the late 80's with the establishment of big atrium hotel-like or mall-like that incorporates nature (Verderber and Fine, 2000). To these followed the development of proper distribution streets within the spatial layout.

Actually, due to this function of transition areas, public spaces aim at progressively accompanying the user within his/her health journey guiding him/her in the status transition from a public sphere to a private one. Thus public spaces can negatively or positively affect users, visitors and staff in their expectations.

1.2 The idea of space and social rights

From Europe Whitepaper (2007) we read that "Community health policy must take citizens' and patients' rights as a key starting point". The powerful effect of this policy can be analysed if we consider linkages between the right to health and the space of care. There is strong evidence that places of care for weak people need to promote participation.

Therefore the creation of places and spaces of care must consider participation as an essential requirement for social rights satisfaction. In fact, social rights are based not on a person claim, but on a process of participation in life expressed in a place (Von Benda-Beckmann and Griffiths, 2009). Therefore legal rules that embody such rights must consider the particular connection of the human's life with those places or, specifically, with the spaces where life takes place.

The working hypothesis is that the full satisfaction of social rights does not depend solely on the distribution of single state benefits, but on social life as it happens in places such as the built environment and buildings. Therefore social rights require the existence of social links - as family, school, working environment, social and personal life environment - in which and through which everybody becomes a person and is able to express him/herself as such. Space is essential for the meaning of social rights: it is more properly the place where these rights are exercised, and not the practical result of politics.

We assume that there is a close relationship between social rights and space. The research is going to develop this assumption relating to the kind of relation and the way in which space affects the dynamics of the rights protection in hospital facilities.

The social dimension of space is the pivot to discover a new dimension of social rights and at the same time it represents a connection between Architecture Discipline and Law Discipline. In fact, the relationship between space and society is like a dogma in defining the nature of architecture, from the functionalism of the Modern Movement to the works by C.

Alexander. For this reason now we frequently hear of discussions about 'social space' and 'social power of architecture'. So we use architecture as a tool for social expectation, but also as an aid to promote social politics and social rights.

1.3 Originality vision of the research

The new vision identified by this research is the social dimension of space as dimension of social rights. The most important innovative contribution which improve on knowledge consist of making evident that architecture contributes to enjoyment of rights.

The space makes possible the enjoyment of right to health, both because it fosters efficient supply of performance/service and because it creates condition for psycho-physical comfort and because it fosters accessibility and integration in the community. Some dimensions of these health rights are: privacy, control, proximity, access to information, relations-based approach[5].

The points of originality of this project are mainly two.

The first is the approach to the theme of public spaces within hospitals not as a canonical approach. The first innovation, in fact, resides in the consideration of 'space of care as relationship', between patient and staff (medical and administrative), between patient and visitor (caregiver and relative), and between patient and patient. In the scenario of socio-spatial study on hospital architecture, the Evidence-based studies on humanisation (Zimring, 2009; Ulrich et al., 2008) and on the supportive psychosocial environment (Dilani, 2006), was focused on relations between environmental quality and users satisfaction. In this study the focus is moved in exploring the role of the environment in facilitating social relationships. This study indeed aimed at isolating those aspects that move the attention from a patient-centred approach to a relation-based approach (Beach et a., 2006). Within the relationship between the built environment and the care, an emerging element is that many studies investigated the hospital rooms and just few regarded the public spaces.

The complexity of the issue acts also a changing in methodology, because the idea is not to deliver guideline for good practices in design of these spaces, but to understand deeper the relationships and the relatives influences that work on architecture field. Particularly the relation between protection of health rights and places is taken in account.

The other originality point of the project is about taking an advancing in research method for design articulated on analysis, monitoring and decisions support methods taking into account new users' needs related to right to health. This progress in research methods is very useful for architects and for those who are decision makers in health politics (delivers and managers).

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[5] These new dimensions of health rights emerged from the on-going interdisciplinary research of SPACES Interdisciplinary research on health care spaces (www.rightspaces.eu). This study has been funded by the Region of Tuscany and is the project currently involving the research fellow. The team includes scholars of lawyers, sociologists and architects.

2. Methodology

Since the focus of the research on the 'relation-based approach' as new paradigm of right to health, we decided to investigate how space affect the experience of patient in public spaces, exploring the relation between space and pattern of users' behaviour to know how space protects social rights. So we adopted a survey-based approach to collecting information on aspects of the 'relations', analysing case studies of hospital buildings using a GIS technology.
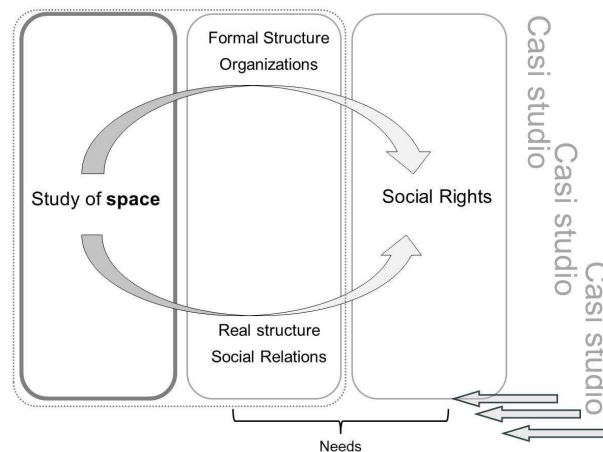

Figure 1: Diagram of relation between space and social rights. The relation consist of a 'formal structure' and 'real structure'. The first is the set of procedures and regulations and, in SPACES research, it is studied by the legal scholars. The second is the set of spontaneous and adapting social relations studied by the sociologists and by architects.

We combined spatial analysis of hospital layout with observations of user behaviour. The spatial analysis was led by configurational analysis methodology integrated with traditional architectural methodology such as functional and typological analysis and the observation was carried out by snapshot technique. Both the methodologies were applied at the same kind of spaces.

We choose these methods because it needs to observe the 'real structure' of society - that is behaviours and adaptation of procedures that happen in space (Fig. 1) -, in order to understand new needs related to right to health. Then because it needs to study those elements of space which have to do with pattern of users' behaviour. We choose to focus on configurational aspects as they affect the social relations in space: meeting, communicating, taking and giving information, getting closer (Hillier, 2007).

2.1 Syntactical description of spatial layout

The configurational analysis methodology used is Space Syntax (SSx), a method developed at Bartlett School of London. We adopted such methodology as suitable for study the

relationship between space and society, between configuration of space and patterns of users' behaviour.

The method moves from the idea that buildings are 'social object' (Hillier, 2007). They significantly perform in fulfilling and sustaining human society. SSx analyses mathematically the complex relationships of space to achieve a description of its quantitative and qualitative syntax proprieties and how they affect how people exploits space, thereby favour or undermine relationships among users.

SSx method and technique infers, through social observations and spatial layout analysis, the existing correlation between social and physic sphere investigating how much architecture impress social relations. Spatial configuration is space through which people move, and in which they are brought into face-to-face contact with one another. Contact is a prerequisite for interaction, communication and the transactions of social and economic life (Penn, 2008). Therefore configurational approach seems to be the most appropriate method to fit with the purpose.

The SSx method is based on the idea of *configuration* which is defined as a set of interdependent relations in which every relation is determined by its relation with all the others. Relation can be studied among different spatial elements: rooms, streets or networks. The spatial elements selected, their representation (lines or convex spaces), their relations constitute the spatial model. Line represents the visual straight line passing through a space, whereas convex space represents the space in which every point in its perimeter can be seen from each other point of its perimeter.

Relations among spatial elements are analysed by software generating parameters. The most important parameter is the *Integration*. It refers to accessibility as geometric property of space and express how much every space in the system is accessible from every other space of the system.

The integration value is described by maps showing the spatial accessibility degree in the spatial model concerned, using a value scale (to which a greyscale colour corresponds) going gradually from spaces more integrated, i.e. those more easy accessible (conventionally black), to spaces less integrated, i.e. more difficulty accessible (conventionally light grey).

The degree of accessibility is a property of space calculated considering geometrical and topological variables of a spatial layout as: changes of directions, length, distance, deep, connections and angular degree of intersections among spatial elements. Studies (Hillier, 2007; Hillier and Hanson, 1984; Penn, 2008; Penn et al, 2007; Turner, 2000; Penn and Turner, 2002) have shown that the degree of accessibility is a good predictor of people movement.

2.2 Description of social data

The observation technique selected to investigate the patterns of users' behaviour is that of snapshot. It consist of a sequence of snapshot of the activity occurring at a precise moment in the space. Every category of people, position, activity and interactions are graphically recorded on a GSI plan. We choose this kind of technique because, according to a socio-spatial approach, space is lived by people. Moreover because snapshot technique allows us clearly to determine the type of relation, which has a fundamental role in our research (see Introduction).

Our concern here focuses on understanding pattern of users behaviour, so we excluded studies about specific events which were faced by the sociology group.

Particularly the observations served to locate where and how people move inside hospital taken as case studies, and to locate where a certain type of relations happen and among which categories of people.

We observed Patients, Old Patients, Foreign Patients, Medical Staff (doctors and nurses), Administratives , Porters. We noted different kind of relations: Health, actions and interactions regarding to health and care; Social, generic actions and interactions; Wayfinding, actions and interactions regarding information on wayfinding.

2.3 The analysis

We conducted analyses matching spatial models of every case study with social pattern noted during the observations. As first step we created a public spatial model considering all spaces free accessible by public (corridors and rooms where outpatients and visitors can arrive by themselves). The public model represents correctly the public spaces system of the hospital, that is those spaces which we suggest are meaningful for the enjoyment of right to health.

In the spatial model we divided space by convex spaces adopting the following criteria: the geometry of space (spaces where every point in the perimeter are visible from every point), the visual field of observer (spaces completely visible by the visual field of observer walking on it), the function belonging to space (deskpoint, waiting area).

Looking at the configurational analysis we read a description of the complexity of the spatial system. This complexity is measured by a geometrical (number of lines, number of convex spaces, surface, metric distances) and a configurational point of view (*Integration*).

The comparison between pattern of users' behaviour and configurational characteristics of space bring to light two intermediate results. The first consist of a series of meaningful topics describing the relationship between space and rights. The second result, referring to architectural discipline, consist of a series of spatial indicators for every meaningful topic.

3. Results

3.1 The framework

Interpretation of data produced by case studies analysis leaded up to collect them in a summary tool defined 'framework' which includes the key topic in enjoyment of right to health (Table 1).

The framework is structured in three sections. In the first section there are the two dimensions of right to health: *Relation* and *Proximity*.

Table 1: The interdisciplinary framework

New dimension of rights to health		Meaningful Topics	Maps
Relations	Proximity	Accessibility	
		Physical accessibility (Complexity of spatial system, Geometric compactness, Accessibily of public vertical link from main entrance)	
		Intelligibility	
		Access	
		Visibility	
		Location of access respect to integration accessibility core	
		Walkability	
		Permeability (from public to private sphere)	
		Location of welcome and reception	
		Waiting	
		Organization of emergency and outpatient flow	
		Quality of waiting: Light, Furniture, View	
		Access to waiting area	
		Morphology and visibility of doors	
		Access to information	
		Accessibility of information points	
		Wayfinding	
		Intelligibility	
		Relationability	
		Social contact (person-institution; person-medical staff)	
		Taking charge of the patient	
		Identity	
		Image	
		Hospital mission	
		Social role	

Relation is a dimension concerning the relation between person and hospital institution (formal and informal), person and person, person and public power and it could be

cooperative, conflicting or competitive. *Proximity* is a dimension structured in spatial (distance, urban context, transportation, orientation), cognitive (right to information, right to know roles and functions, informed consent, living will), political (active citizenship - not a mere target of regulations and policy).

In central section there are all topics of interdisciplinary interest. Within each topic there are the elements emerged from case studies analysis which could become indicators for enjoyments of right to health. For instance looking at *Waiting* topic we find especially three architectonical aspect which have to do with the waiting inside the hospital: 1) the location of waiting area in relation to circulation flow which affects accessibility for the patient; 2) the morphology and visibility of the entrance doors of the health service in waiting area which is related with the patients need of 'take in charge'; 3) elements as light, furniture arrangement, view outwards that directly affect users comfort and indirectly affect trend to social interactions.

In last column the visual maps (Fig. 2 and 3) which highlight the importance of related indicators find place.

3.2 The Access

We want provide here in a detailed way an example considering the topic *Access* and looking how accessibility and visibility characteristics of spatial layout can facilitate access to information and access to health service.
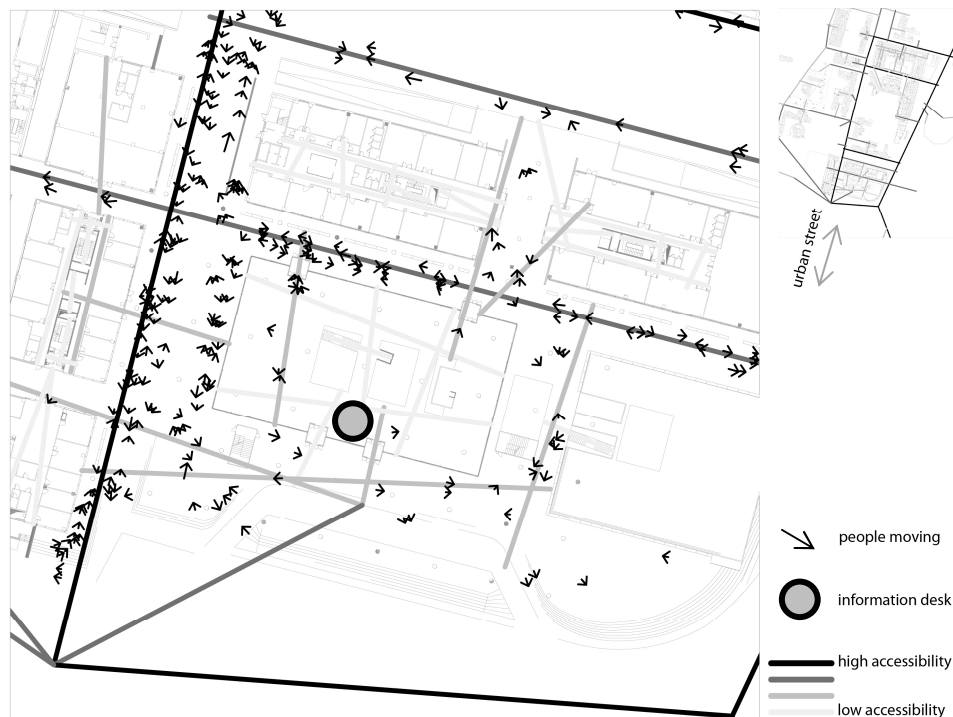

Figure 2: Careggi Hospital: on the right top the accessibility map of the hole hospital, on the left a zoom on the access to the hospital from the urban street.

We propose here a comparison among hospital entrance of Santa Maria Nuova and Careggi which allow us to observe the critical point in access to hospital for a patient. We can note in the maps: the layout analysis (axial lines in greyscale), the location of information point (circles), the concentration of meaningful groups of social relations, the users desire line (arrows) (Fig 2 and 3).
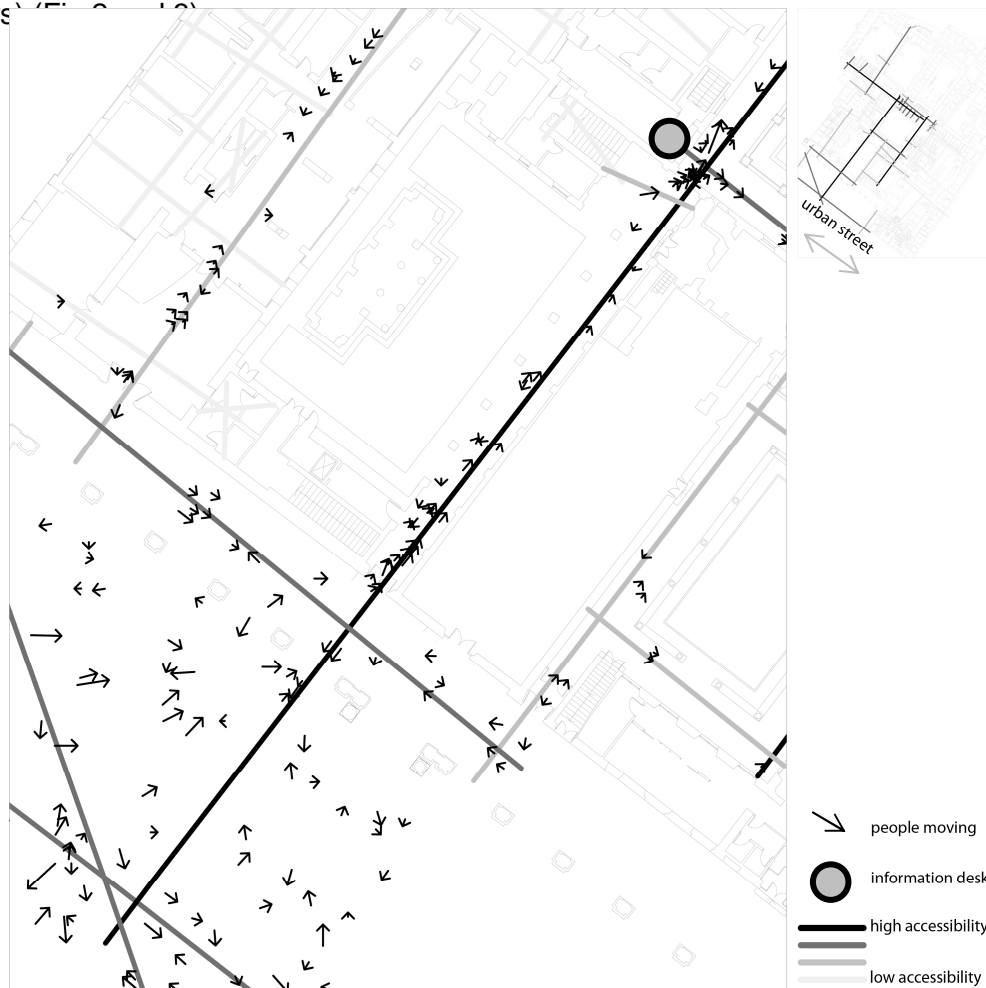

Figure: 3 Santa Maria Nuova Hospital: on the right top the accessibility map of the hole hospital, on the left a zoom on the access to the hospital from the urban street

The layout analysis is represented by the accessibility map of hospital (Fig 2 and 3 on the top right) obtained with the configurational analysis: each line that represents a circulation path assumes a grey scale color which indicates his accessibility degree in relation to all other lines of the hospital system. The black arrows represent people moving from the city to the inside the building meanwhile they are entering to the hospital. We can see in the maps the location of welcoming desk: in the Careggi hospital the desk is neither visible nor accessible as it is out of the desire line of the patient and in a space with low accessibility (lines light grey), although with glass walls. In the Santa Maria Nuova Hospital the desk is not directly visible from the entrance, but it is more accessible as it is on the central axis of access to the hospital, represented by a line with high configurational accessibility.

This has to do with access to information and with equity to the access, two important topic for right to health. A particular meaningful result which gets a central aspect of relationship

between protection of rights and physical space is represented by identification of critical point of patient journey, both spatial and organizational, and useful parameters in order to intervene in a managing and transformation phases.

4. Conclusion

Interdisciplinary approach has been important to understand how configurational properties of space, in particular accessibility and visibility, can affect on social and behavioural dynamics in order to fulfil right to health. Through the interdisciplinary work social and legal problems have arisen and how they are related to the spatial. The framework in Table 1 represents the integrated results. In this paper the indicators under the topics are related to architectural field and are adaptable to every context of transformation and monitoring in hospital. They can be a useful tool for the management of hospitals and for the architects as it improve the awareness in designing or refurbishing new hospitals.

The GIS use has been a tool particularly convenient for this interdisciplinary research in which space plays a significant role. The GIS has allowed spatializing social and spatial phenomena and showing them in thematic maps for a comparison. This tool applied to the building scale can have great potentiality in the healthcare sector to monitoring organizational, managerial and spatial transformations.

Future developments of the research are from one hand creating an evaluation tool for politics, healthcare management teams and healthcare designers, that it will be generated from the indicators found. On the other hand translating to the healthcare network in the territory the study among social rights, social phenomena and space.

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