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A proposal of hygienic and sanitary standards for the new Building Code in Italy

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Abstract

The traditional emphasis of Public Health on the type and quality of housing today merges with other wider determinants of health such as: the neighbourhood, the community and the "place" where a home is located, but also the policies that make access to a healthy home within everyone's reach. At the neighbourhood scale, context-related aspects heavily influence the internal quality and real usability of the buildings themselves, with particular reference to factors such as the quality of the site, the relationship between the building and the context, the presence and quality of the greenery and open spaces surrounding the building, as well as all measures that make it possible to reduce the building's impact on the environment, to protect it against environmental pollution, and to manage the building in an integrated manner for maintenance purposes. Creating healthy living environments means referring to the different dimensions mentioned above, and this not only requires the attention of Public Health operators, but also implies an integration of vision and objectives among various professional skills and competences that puts health at the center of all policies. This proposal, which starts from the analysis of existing local hygiene regulations and scientific literature, aims to take stock of a number of areas considered fundamental for the assessment of building hygiene aspects, with particular reference to the eco-sustainability of buildings and adaptation to climate change. The aspects identified can be considered as a starting point for the preparation of integrated building and hygiene regulations based on documented effective practices for the protection of Public Health.

Introduction

There is now much evidence that improving the quality of the built environment can help to combat many of today's Public Health problems, especially in the most socio-economically deprived areas [1, 2].

Housing conditions have been a constant target for Public Health purposes throughout the modern age of Public Health - the scientific discipline, or issue. However, the nature of the housing and health challenge has changed in response to an evolution in the understanding of the different factors

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affecting Public Health. Today, the traditional emphasis of Public Health on the type and quality of housing merges with other broader determinants of health. These include the neighborhood, the community and the 'place' where a home is located, but also the policies that make it possible to have access to a healthy home that is affordable for all [3], these approaches to housing policy and action have the potential to contribute to the "triple win" of health/well-being, equity and environmental sustainability. However, there is a need for more effective housing policies (both Public Health protection and promotion in general) that adopt more systemic approaches to address the complex interactions between health, housing and the wider environment [4-6].

This document outlines some of the key components of the housing and health challenge in developed countries (according to the EU policies like the Sustainable Development Goals - SDGs) and presents a conceptual model for coordinating activities that, as outlined above, can offer health/well-being, equity and environmental sustainability. This is achieved by offering a perspective on how to act more effectively, inclusively and across sectors when identifying sustainable housing interventions [7].

The concept of *housing quality* covers a wide range of issues, which are related not only to the housing itself, but also to the surrounding residential area [8, 9]. This implies the need to direct choices towards improving the overall conditions of the living environment, managing the built environment according to a new approach in which the building must be designed in relation to the area in which it is located, not only in environmental terms, but also economic and social[10].

According to Habitat II, the Second UN Conference on Human Settlements (Istanbul, 1996), the living environment is to be considered adequate if it promotes the physical, social and mental well-being of individuals through design, construction, maintenance and territorial location capable of supporting a sustainable environment and a cohesive community [9].

Adequacy means privacy, sufficient space, physical accessibility, flexibility of space, security, stability and structural durability, suitable ventilation, heating, lighting, basic infrastructure such as water supply, proper waste management, suitable environmental quality, easy access to work and basic facilities, and all at affordable prices [11, 12]. These specific qualities of housing take on particular importance especially today, during the COVID-19 pandemic, which forced the inhabitants to distance themselves physically, and in some cases to self-isolate within the home, and more generally to change their habits in carrying out daily activities (work, study, relaxation, children's play, etc.). Having adequate space in the home is, in fact, a fundamental aspect for well-being and health, as the interpersonal distance and spatial relationships between people and the environment play a fundamental role in feeling comfortable or uncomfortable in a given situation [11, 12].

The significance WHO attaches to a healthy living environment is based on an integrated model, which links *housing and living space* to the *community and the surrounding environment.*

It is well known, in fact, that aspects related to the context on a neighborhood scale, considered of utmost importance by WHO [9], heavily influence the internal quality and the real usability of the buildings themselves. This refers in particular to factors such as the quality of the site, the relationship between the building and its context, the presence and quality of the greenery and open spaces surrounding the building, as well as all the measures that make it possible to reduce the building's impact on the environment, to protect it against environmental pollution, to manage the building in an integrated manner, for the purpose of its maintenance

[13]. WHO also considers that the building's environmental impact can be reduced by means of a series of measures that can be taken in order to reduce its impact on the environment. The *dwelling* represents a refuge protected from the outside world, and an environment to which a sense of personal and family identity is associated, while any intrusion of external factors limits its social function.

Inadequate indoor *living space* conditions can trigger various effects on human health and also compromise the social function of the dwelling. The social cohesion of a *community*, the sense of trust and friendship, are significantly influenced by the quality of the neighborhood, which can promote or prevent social interactions through the presence and quality of services, facilities and public places for social life. Finally, the *environment surrounding* the home also has a direct impact on human health: in poor areas of the city or in deprived residential areas, public services, green areas or parks, pedestrian paths, cycle paths, etc. are often lacking; this is often associated with difficulties in socializing and exercising adequately by the inhabitants [14, 15].

In Italy, a scheme of standard building regulations (RET) has been adopted, provided for by the agreement (*Associazione Nazionale Comuni Italiani* - National Association of Italian Municipalities) of 20/10/2016 [16], to simplify and standardize the territorial planning within the municipality and with the intent to integrate in a single document the hygienic, sanitary, urban and environmental aspects.

The present proposal, which starts from the analysis of existing local hygiene regulations and scientific literature [17], aims to take stock of a number of areas considered fundamental for the assessment of building hygiene aspects, with particular reference to the eco-sustainability of buildings and adaptation to climate change. The aspects identified can be integrated into the scheme of Standard Building Regulations (RET), so as to define a starting point for the preparation of integrated hygiene and building regulations based on documented practices that are effective for the protection of Public Health.

Aspects relating to the usability of buildings will not be described as they are considered to be pre-requisites and an integral part of the proposal to update the MD of 5th July 1975.

Description of the rationale of the proposed update

For each area taken into consideration, the aspects with the greatest impact on Public Health have been highlighted, for which performance targets and performances have been identified (Tab. 1-4).

As it can be seen from Tables 1 and 2, the description of the health impacts of some performance targets and performances reported in these tables is incomplete, since they have already been dealt with in the article concerning the updating of the Ministerial Decree of 5th July 1975.

The description of the proposal has been divided into the following four areas:

- site and context;
- pollutants' reduction;
- energy and comfort;
- recovery, management and maintenance.

Below is a description of the rationale for each area examined.

Site and context

This area, shown in Table 1, is divided into four sections: the analysis of the site; the relationship between the building and its context; green spaces and microclimate control; the orientation of the buildings and interiors.

Tab. 1 - Health performance targets for new buildings to be integrated into the *Regolamento Edilizio Tipo* (Building Code) - Site and Context

Art. 1 **Site Analysis**	**Performance targets**	• Prepare the assessment of the significant and characteristic environmental parameters of the site, in relation to the extent of the intervention. • Pay attention to specific territorial situations, both natural and of anthropic origin, which generate disturbance through the adoption, by the designer, of suitable solutions.
	Performance	• Ensure the collection of climate data and analysis of significant environmental elements that can influence the formation of a characteristic microclimate and that depend on: topography, relationship with water and vegetation, urban morphology. • Ensure the availability of natural light. The determination of illuminance levels in the area is normally obtained by referring to CIE[1] models, adapted to the specific site according to latitude. As far as the visibility of the sky is concerned, it is necessary to evaluate the dimensional and morphological characteristics of the area and the orientation of the site (embankments and hills, buildings close to the intervention area, evergreen or deciduous tree species, orientation of the site, azimuth and sun height for the different hours, on different days of the months of the year with reference to a given latitude). Provide for the use of renewable energy sources or similar by verifying the possibility of exploiting the renewable energy sources present in the intervention area, in order to produce electricity and heat to partially or totally cover the energy needs of the planned building (see also art. Renewable energy sources). • Ensure an appropriate acoustic environment in accordance with the relevant legislation. • Ensure protection from electromagnetic pollution by detecting the presence and position of any sources of electromagnetic field that may be carried out on the basis of specific maps, found at the competent Authorities. More specifically, the following must be detected: - the presence of live conductors (power lines, transformer rooms, etc.) for a surrounding space of at least 150 m; - the presence of repeaters for mobile telephony, radio or television, for a surrounding space of at least m 200. • Ensure reduced exposure to air pollution. Municipal and provincial planning tools should include information on air quality in their knowledge outputs. More specifically, it is necessary to know and provide the location and description of any sources of pollution within a radius of 500 m from the intervention site and, if present, monitoring units, providing the relevant data. • Consider geological factors in the design. In particular, leaving aside all the aspects already included in the current regulations regarding the geological suitability of the soil, it is necessary to have data on the natural radioactivity of the soil.

Art. 2 Relationship between building and context	**Performance targets**	• Guarantee the improvement and requalification of a place through appropriate design strategies that enable the recovery of the identity and value of a specific landscape, especially in order to improve the psychophysical well-being of users and their perception of safety. • Ensure the psychophysical well-being of users when using open, public or public spaces. • Ensure the perception of security in the use of such spaces.
	Performance	• Consider the perceptive characteristics of the intervention by identifying and describing characteristics such as: visual dominance, smells, introverted or collected space, space-time orientation, qualified visuals, good levels of privacy, security, etc.. • To analyze the morphological-distributive and functional characteristics through the description and identification of the routes, the prevalent destinations of use, the functional articulation of the spaces, the relationships between ancillary and service spaces (e.g.: car parks, green spaces, collective spaces and spaces with social functions) and the main activities, types of colours, materials etc. • Ensure the integration of the building with the context, adopting design strategies that enhance or, in case of decay, improve the place. • Propose integrated solutions for the systems through the identification of technical and locational solutions that minimizes disturbance to residents and visual impact in the installation of the systems and ducts. All ducts for conveying vapours, fumes or other emissions into the atmosphere must comply with the technical standards in force. The systems (heat generators, external air conditioning units, antennas, satellite dishes, etc.) and the outlet sections of the relevant ducts must be located in such a way as to avoid situations of annoyance, acoustic/ atmospheric pollution and/or other damage to health. **Open spaces, public or for public use** • Provide separate infrastructure for pedestrian and cyclists. • Ensure the use of resistant, non-slip materials that reduce the albedo of pavement surfaces. • Encourage the construction of parking and crossing areas on the sidewalks, suitably shielded and protected from vehicular traffic. • Ensure the use of vehicle traffic moderation systems (areas 30, specific design solutions such as chicanes, bollards, etc.).
Art. 3 Green spaces and micro-climate control	**Performance targets**	• Reduce the “heat island” effect through urban design strategies and the use of vegetation. • Ensure the presence of greenery to improve the psychophysical comfort of the inhabitants in outdoor and indoor environments.
	Performance	• To guarantee the use of suitable material to control the albedo of the pavement in open spaces in order to reduce surface temperatures, with positive effects on external comfort, on the reduction of solar loads and, consequently, on the need for air conditioning of closed spaces. • Maximize the summer shading of buildings and, in particular, of glass surfaces facing South-South West, of external heat dissipation sections of air conditioning systems, of external walls exposed to West, East and South, of roofs, by arranging vegetation or other screens.

• Provide for the installation of green roofs, which not only restore spaces useful for socializing, but also contribute to control of the urban microclimate, promote evaporation, absorption of pollutants and the reduction of fine dust.

• Provide for the installation of green walls, which contribute to control of the urban microclimate, promote evaporation, absorption of pollutants and reduction of fine dust.

• Provide an adjacent permeable surface that enables the absorption of rainwater.

• Ensure proper green management. For areas of new planting, use native tree, herbaceous and shrub species, according to the lists held by the municipal and/or superordinate planning bodies, and favour those with the following characteristics:
- Reduced hydro-needs;
- Resistance to phytopathologies with consequent reduction in the use of pesticide products;
- Absence of harmful effects on health, in particular in school, hospital and health care areas and equipped public parks and gardens. It is good practice to affix information sheets where green areas contain allergenic plant species and/or those that can cause mechanical damage (by means of spines or spines) and/or that contain urticant or toxic substances, in order to promote correct behaviour.

• Draw up a plan for the management, irrigation and maintenance of green areas, including, in order to minimize pollen dispersion, weed control interventions. The plan should include systems for the recovery and re-use of the organic residue obtained (together with pruning branches), which can be usefully used, when possible, for domestic composting, from which a useful product is obtained to be reused for the implementation of a virtuous process of fertilization and soil improvement, also aimed at the partial reduction of urban waste. It is also necessary for the plan to describe the irrigation systems, the flow rate of emergency irrigation, the water supply methods and the maintenance of all the planned green areas, in order to assess the appropriateness of using rainwater collected in storage tanks, possibly supplemented by suitably treated white and grey wastewater.

For installing paths, furniture and areas for rest and recreation

• Preferably use sand, gravel and stone material found from extraction sites close to the site of intervention or, if necessary, recycled material that allows rainwater to infiltrate, also in order to prevent the multiplication of insects and parasites. Any play equipment, placed in a fixed station, must comply with the requirements of the regulations for the prevention of accidents.

For the construction and/or redevelopment of parking areas:

• Ensure the use of permeable flooring in the construction of parking areas

• Encourage adequate shading of parking areas or parking of vehicles

• Encourage the visual integration or mimesis of parking spaces, with appropriate green solutions.

Art. 4 Orientation of buildings and interiors, natural lighting and external view	**Performance targets**	• Ensure an appropriate relationship between open spaces and the layout of buildings in order to make the best use of them and, at the same time, to mitigate climatic factors (such as prevailing winds, sunshine, etc.) and sources of pollution.
	Performance	• Ensure access to the sun all day long, both for open spaces and buildings, while controlling solar radiation. The correct exposure of buildings to the sun must be identified according to the type. For example, for in-line buildings, it is preferable to choose the layout on the East- West axis to obtain maximum winter sunshine and create opposite faces (main functions to the South, service spaces to the North), or to scale the buildings in height to allow the same amount of sunshine. In the absence of documented technical and functional impediments, the buildings must be positioned with the main longitudinal axis along the East-West axis with a tolerance of 45° and in any case the best possible orientation must be sought. • Ensure the control of solar radiation by using sunscreens, whose size and type do not prevent solar gain in winter. • Orient the indoor environment according to the solar radiation and the natural caloric and lighting inputs. South-East, South and South-West facing is more suitable for day rooms, while the East is preferred for sleeping areas and the North for study, work or buffer zones. • Ensure adequate insulation of the North side, which is a factor in heat loss. • Ensure natural lighting through appropriate orientation and location of openings. The glazed surfaces must be arranged in such a way as to uniformly illuminate the environment and minimize darkening due to overlooking buildings or other external obstructions. In the case of highly reflective front-facing buildings (particularly in the north) the possibility of glare and the implementation of indirect lighting due to the reflection of the rays on the building must be assessed. The orientation of the openings should take into account the intended use of therooms and the different lighting requirements. **For indoor environments please refer to the article relating to the proposal to update the Ministerial Decree of 5 July 1975 - art. 6 of the revised and integrated text of the Ministerial Decree of 5 July 1975**

Site analysis

Historically, the site analysis (territorial, environmental and climatic context of reference) was considered an essential aspect of the design process. In fact, local opportunities and/or obstacles were identified, and projects were planned aiming to satisfy the different well-being needs by making the most of the climatic and territorial characteristics, defining the appropriate shape and orientation, containing costs and limiting the environmental impact [18]. This attitude was, however, partly abandoned in the post-war period, due to a blind faith in the materials and technologies made available by incessant progress. This trust led to a detachment from the relationship with the surrounding environment and to the construction of energy intensive buildings with a strong impact on the environment and Public Health, which in Italy have a significant effect on total energy consumption.

In 2012, WHO, in an international

consultation on the subject of housing requirements [19], took up and updated these concepts, focusing on the need to direct choices towards improving the overall conditions of the environmental system (urban area) and of the building sector within [20]. In fact, the quality of individual buildings, from the point of view of safety, human well-being and environmental protection, does not depend solely on new techniques and materials, but on envisaging and designing the building in relation to the urban context in which it is located, not only in environmental terms, but also social and historical [3, 13].

The surrounding habitat therefore becomes the object of study in order to understand its climatic and landscape characteristics and to optimize architectural forms, in harmony with the environment and the history of the place, in compliance with the urban planning instruments of the municipal territory and the regulations in force [21, 22]. Therefore, the "characteristic elements of the site" (hygrothermal climate and precipitation, soil permeability, availability of renewable resources, availability of natural light, acoustic context, air quality, radioactivity) will condition the design solutions to be adopted to satisfy performance and will involve, in the executive design phase, appropriate technological assessments [13].

Therefore, it is fundamental to analyze the environmental and climatic elements of the site in order to satisfy, through the rational use of resources, the needs for psychological and sensory well-being, with particular reference to thermo-hygrometric well-being in winter and summer, and hygiene and health in general.

Generally speaking, in a specific site, the well-being of the individual is linked to the sensory perceptions he or she draws from it, which is in turn linked to the balance between the interior environment and the surrounding landscape, in terms of temperature, sunshine, ventilation, noise, sight, olfactory sensations.

In particular, the olfactory sensations produced by odors are a negative aspect of environmental impact connected to different plants, such as the treatment and disposal of solid and liquid waste management, or to particular productive activities (e.g. intensive breeding). They are sensations generated by the interaction of the receptors of the olfactory system with some chemical compounds, present in a gaseous mixture and sufficiently volatile [23]. Although in general no direct effects on health have been demonstrated, they are the cause of unquestionable and persistent annoyance for the population living nearby, becoming an element of conflict both in the case of already existing installations and in the choice of the sites for new plants. In recent years, this problem has aroused increasing interest, mainly due to the planned location of installations in urbanized areas [24].

In addition to sensory perceptions, some site specific factors (e.g. noise, climate, radioactivity, pollution, orography, etc.) have real impacts on health. In this section the focus is mainly on the impacts of vehicular traffic and climate. As is well known, there is a direct relationship between pollution and climate: solar radiation, in the presence of primary pollutants due mainly to vehicle traffic (e.g. No_X, VOCs) or point source emissions, cause the formation of secondary pollutants, such as O_3. The latter, being one of the greenhouse gases, contributes significantly to global warming [25]. The effects of global warming can be seen in the increasingly frequent adverse and extreme climatic conditions responsible for violent and harmful impacts on human health and well-being [26], which the built environment is often unable to cope with. WHO estimates that the health effects of climate change and, in particular, global warming, will be among the most significant faced in the coming decades [27]. Heat waves and high temperatures are a major cause of death, with a very short latency time (1 to 3 days) [28].

For example, the heat wave of 2003 caused more than 70,000 deaths in 12 European countries, especially among older people in the population [29].

These phenomena find their maximum expression in large urban centers, as overheating depends on the thermal and radiative characteristics of asphalt and concrete surfaces, which absorb heat and do not allow adequate transpiration and evaporation of the ground; other factors also contribute, such as, for example, the widespread presence of systems that disperse heat to the outside or the dark roofs of buildings. Often in these contexts there is a scarcity of green areas, key factors for the regulation of the local microclimate.

The consequences of exposure to cold climates are also relevant to health, showing higher impacts on mortality than those induced by heat [30]. Death patterns are very different: heat causes the body to overheat and alters the balance between fluids and electrolytes; cold induces a drastic reduction in blood flow to the epidermis, with consequent changes in blood pressure and interference with immune defense capabilities. Also in this case, children and the elderly are the most sensitive population groups, together with other vulnerable groups in society (e.g. homeless people). In Italy, the seasonal variation coefficient of mortality, which measures the excess of deaths during the winter months (from December to March), compared to the rest of the year, shows an average increase of 16%; this difference in mortality between seasons has often been associated with different levels of thermal insulation of homes [31]. It is estimated that the impact of climate change will be accentuated by ongoing European demographic trends, which show that, by 2050, the population aged ≥65 years will reach 30%.

As a result of climate change, there have been significant changes in the frequency and intensity of extreme weather phenomena (periods of heavy rainfall, prolonged drought, strong winds and natural disasters). Therefore, it appears more important than ever to assess the resilience of the site to these events when carrying out the site analysis. According to the Ministry of the Environment, about 2.6% of the national territory is at risk of flooding [32]; since the beginning of the 21st century there have been more than 4,000 events of hydrogeological instability due to landslides and floods, 380 of which with considerable damage to buildings and infrastructure, but above all with hundreds of deaths and a large number of displaced persons [33].

The possible direct and indirect health effects of these phenomena are many and complex: in addition to the problems of food availability, possible pathologies associated with the dispersion of chemical contaminants in the environment following flooding, as well as health consequences related to the microbiological contamination of coastal, recreational, surface and groundwater recharge areas, etc. [34]. The most serious consequences are found in areas with "uncontrolled" urbanization, often characterized by "illegal" and "irregular" building. These areas are in fact more at risk of landslides and flooding due to the excessive reduction of natural areas (wooded areas, parks, etc.), which can control these phenomena, but also due to the lack of planned investments useful to allow the runoff of water or the construction of suitable "buttresses" to prevent landslides. Moreover, as the number of waterproofed areas increases, the natural capacity of the territory to absorb, slow down and laminate is reduced; even non-extraordinary rainfall events are enough to cause flooding of entire neighborhoods and cause significant damage to buildings (e.g. basements), the environment and health [35]. For these reasons, understanding and predicting the risks and impacts of climate change in the territory, with specific attention to urban areas, is now also a health priority [13].

Relationship between building and context

To better understand the relationship between living environment, human behavior and health, it is necessary to underline the complexity and interactivity of the relationship between context and the individual [36]. The qualities (e.g. in terms of accessibility, safety perception, etc.) and the components (e.g. functional complexity, design of urban spaces and green areas) of the built environment influence the choices, the behavior of the inhabitants and, indirectly, their health and well-being. For these reasons, the areas where people live and where daily activities take place should be aesthetically of high quality and well looked after, as they are able to give positive impressions to the inhabitants.

The well-being of the individual linked to the integration of the building into the context is generated both by respect for sensory perceptions and by comfort factors, such as a sense of social inclusion, security, sociality, etc. [37].

In particular, in recent years, attention has been paid to issues related to distrust in the neighborhood and concerns about crime, as these are involved in a cycle leading to a progressive decrease in health [38]. In fact, people who consider their neighborhood to be dangerous, particularly women and the elderly, are less physically active [39]. The implementation of well-designed security measures such as proper street lighting or safe access can potentially reduce the fear of crime [40] and can contribute to improving mental well-being [41].

Often, in the scientific literature, the compact city with high settlement density has been considered more *salutary* than urban forms characterized by scattered settlements and low residential density [42]. The 'dispersed' or 'scattered' city, with a low settlement density, defined in relation to health as *Obesogenic Urban Form* [42], is in fact generally characterized by residential, commercial and office areas clearly distant from each other, which requires the use of means of transport, most often private, for daily travel. Several studies show a dynamic relationship between the physical characteristics of the compact city and lifestyles, observing a direct, albeit sometimes limited, link between these and residential density, functional mix, intersection density, public transport density, number and proximity of parks and green spaces [43-45].

However, green areas are not always feasible in the neighborhoods, especially in historic and long-established cities. In these cases, it is important to redefine the way neighborhoods are used, adapting them to health needs. For example, making some areas walkable and safe, to ensure the usability of the streets within them, improving the environmental quality, optimizing active transport and public transport and encouraging citizens' participation [46, 47].

Green spaces and microclimate control

Urban design models greatly influence the microclimate and external thermal comfort in a given urban morphology, due to the complexity of the built environment. Variables such as heights and construction orientations, spaces between

buildings, and plot coverage alter solar access and wind speed and direction at street level. Urban design elements, including vegetation and shading devices, can be used to improve the microclimate and well-being of the population [48].

It is therefore important to increase greenery and permeable surfaces and counteract the "heat island" effect in urban spaces, in order to improve the microclimate and comfort and reduce energy consumption.

The availability and proximity of green spaces in the urban context has been linked, especially in recent years, to a wide range of health and well-being benefits [49], as they affect, directly or indirectly, climate, lifestyles and behavioral aspects, social equity and quality of life in general. One of

the main health effects is related to urban climate mitigation, helping to reduce the health impacts of heat waves, the health consequences of which have already been described above (site analysis).

Other possible health effects include increased opportunities for physical and recreational activity, relief from daily stress and, in general, the promotion of psychological well-being and social relations [50]. A study carried out on 350,000 subjects [51], found a lower frequency of certain pathologies (coronary heart disease, skeletal disorders, anxiety, depression, respiratory infections, diabetes, etc.) in those who lived less than 1 km away from parks or green areas, while, in urban centers with little greenery, the risk of diabetes and asthma showed an increase of over 33%. The effects of urban greenery on Mental Health, in addition to the reduction of stress levels and mental fatigue, can help to mitigate excessive emotional states such as anger, anxiety, sadness and depression [52]. Green spaces affect Mental Health by acting on various levels: stimulating physical activity, providing meeting places for neighborhood residents, encouraging social ties [53] and alleviating stress and mental fatigue [54]. Their presence seems to produce a greater sense of community and belonging and is also linked to a reduction in crime rates [55].

However, it is important to point out that several aspects that have not yet been clarified make it difficult to use the information gathered from the literature in the sector for design purposes; the evidence comes mainly from observational studies, where the cause-effect relationship cannot be assessed. Among the critical aspects, there is still no unambiguous definition of green spaces (parks, cycle paths, gardens, etc.) in relation to the effectiveness observed, and reliable indications are scarce regarding the optimal distance of the usable green space from the home and the best dimensions to encourage physical activity [56].

In addition to the potential health benefits (air quality, social cohesion, Mental Health, physical activity), the presence of green spaces can lead to health risks (e.g. for vulnerable people), mainly associated with exposure to allergens such as plant pollen (e.g. anemophilous) and the emission of biogenic volatile organic compounds (BVOCs), which can act as air ozone precursors. These emissions are influenced, in terms of quantity and quality, by plant species and environmental stress (e.g. drought, heat and infestations). A recent study indicates that planting one million trees with low BVOC emissions compared, for example, to one million English oaks (trees considered high emitters) in Denver (USA), is comparable to preventing emissions from as many as 490,000 cars [57].

Climate change, globalization and increased global trade are also changing the spread of alien plants, many of them allergenic, which find new growth opportunities in areas whose climate was previously unsuitable. It is therefore essential to promote the management of green areas aimed at cleaning up and, where possible, eradicating allergenic species, with particular attention to water drainage, in order to prevent the proliferation of insects [58]. Among other things, the proliferation of weeds can act as a refuge for pests, especially rodents and reptiles, but also become a place of accumulation of manure of all origins and types. This is even more true for those small areas of debris, or spaces between road lanes, both public and private, which are often found in urban areas. Correct maintenance also prevents tree species from reducing the amount of natural light arriving to poorly lit houses and the spread of allergenic parasites, especially in the warmer seasons [59].

Building and interior orientation, natural lighting and external view

As previously stated, the place where a building is built is an important design

element: orientation in relation to the sun's path and wind direction are factors to be taken into account in order to make the best use of natural resources and ensure a healthy life inside the building [60].

Taking into account the orientation of the building in relation to the sun's path during the design phase enables it to make full use of solar radiation, saving up to 50% of the energy used for heating and/or cooling of the same building, with consequent benefits in environmental terms and reducing the cost of energy [61].

It is important to create within the settlement a privileged and balanced relationship between the buildings, the open spaces, the spaces for relaxing and socializing and the environment in which they are inserted in order to guarantee comfort and allow the exploitation, and at the same time, the mitigation of climatic factors.

Natural lighting and sunshine are of great importance for health and hygiene [60]; for a description of the health impacts of these factors, please refer to the article on the proposal to update the MD of 5th July 1975.

Pollutants' reduction

This part, reported in Table 2, is divided into five sections: reduction of exposure to air pollution; reduction of exposure to noise pollution; reduction of exposure to high and low frequency electromagnetic fields; reduction of indoor pollution levels; use of materials with reduced emission of pollutants. With the exception of air pollution, for a description of the health impacts of other forms of pollution, please refer to the article on the proposed update of the Ministerial Decree of 5th July 1975.

Air pollution reduction

Air quality is one of the most important Environmental Health determinants and air pollution is now one of the main ecological and environmental problems, both in terms of its direct (acute and chronic) health consequences and its consequences for the climate [62]

It is therefore necessary to create a suitable context compatible with the intended use, through the mitigation of air pollution (including bad smells) coming from the settlement itself and/or from any other sources present on the site.

The health impacts of air pollution can be quantified and expressed in several ways. These include morbidity and mortality estimates. Mortality is linked to reduced life expectancy following exposure to air pollution, while morbidity refers to diseases, ranging from subclinical effects (e.g. inflammation) and symptoms such as chronic coughing, to conditions that may require hospitalization. Even less serious effects could have strong Public Health implications, as air pollution affects the whole population on a daily basis.

Most of the evidence on health impacts attributable to exposure to air pollution tends to focus on specific areas (particularly respiratory, cardiovascular and lung cancer) and early morbidity and mortality [63]. However, there is growing evidence that exposure can also lead to other effects [64].

According to WHO, air pollution causes about 3 million deaths worldwide every year and about 90% of people breathe air that does not comply with the WHO Air Quality Guidelines [65]. Urban air pollution is responsible for more than 1,300,000 premature deaths worldwide each year and, of these, more than one million could be avoided if the annual average exposure levels proposed in the *Air Quality Guideline* (PM_{10} = 20 μg/m^3 and $PM_{2.5}$ = 10 μg/m^3) were met in all countries [66]. However, a considerable amount of scientific knowledge and epidemiological evidence has been gathered in recent years, on the basis of which the International Agency for Research on Cancer *(*IARC) has included outdoor pollution - as a mixture of pollutants and especially regarding the role of particulate matter - among carcinogens for humans (group 1) [67].

Table 2 - Health performance targets for new buildings to be integrated in the ***Regolamento Edilizio Tipo*** (Building Code) - Pollution reduction

Art. 5 **Reduced exposure to air pollution**	**Performance targets**	• Ensure adequate protection of buildings against possible sources of air pollution, with particular reference to vehicular traffic and unhealthy activities.
	Performance	• Locate sensitive users (hospitals, clinics, nursing homes, school buildings at all levels, residences, areas with outdoor sports/recreational activities etc.) away from possible sources of air pollution; • Locate open spaces "upwind" in relation to the main polluting sources; • Locate open spaces away from pollutant "channels" (buildings oriented parallel to the dominant air currents); • Locate buildings, outdoor spaces and furnishings in such a way as to encourage the removal of pollutants rather than their stagnation.
Art. 6 **Reduced exposure to noise pollution**	**Performance targets**	• Take steps to reduce exposure to noise pollution both indoors and outdoors.
	Performance	• With regard to outdoor pollution, reference should be made to the relevant legislation in force[2]. **For indoor environments please refer to the article relating to the proposed update of the Ministerial Decree of 5 July 1975 - art. 9 of the revised and integrated Text of the Ministerial Decree of 5 July 1975**
Art. 7 **Reduced exposure to electromagnetic fields**	**Performance targets**	• Take steps to reduce the intensity, duration and level of high frequency (EMF-RF) and low frequency (CM- ELF) exposure.
	Performance	• If installations such as radio base stations (RBSs) for mobile telephony, radio and TV repeaters, radio communication systems, are located within 200-metre radius, check compliance with the electromagnetic field limits by means of estimates or measurements. The legal limit (attention value) not to be exceeded is equal to 6 V/m, intended as a 24-hour average, in correspondence with buildings used as living quarters with continuous stays of not less than four hours per day and in the related external appurtenances with habitable dimensions, as defined in the Guidelines of the Ministry of the Environment Decree of 7 December 2016 published in the Official Gazette no. 19 of 24 January. • *In case of presence* (approximately within 70 meters for 132 kV lines, 80 meters for 220 kV lines, 150 meters for 380 kV lines and 3 meters for transformer rooms) *of lines and equipment for the production, transmission, distribution and transformation of electricity,* check that the building is outside the "buffer strips" referred to in the Ministerial Decree of 29 May 2008, based on the distance between the receptor and the source, which must be greater than the DPA (Distance of first approximation) provided by the Manager. **For indoor environments please refer to the article relating to the proposal to update the Ministerial Decree of 5 July 1975- art. 8 of the revised and integrated text of the Ministerial Decree of 5 July 1975**

Art. 9 Use of materials with low pollutant emissions	**Performance targets**	• Ensure the use of suitable material to ensure indoor air quality levels compatible with occupants' well-being in the short and long term.
	Performance	• Use products and materials with low emission potential of VOCs and other chemical pollutants in the short and long term. • Choose finishing materials that have undergone specific checks and certification for polluting emissions, in order to minimize the contribution of VOCs, in accordance with current regulations. • Confine man-made vitreous fibres (MMVF) and/or organic fibres (MMOF) within closed enclosures when used. • Choose materials with a low Radioactivity Index (I), i.e. materials with values of $I \leq 0.5$.

[2] In particular, reference is made to the following standards: Noise pollution framework law no. 447 of 26 October 1995; Prime Ministerial Decree of 14 November 1997 - Determination of limit values for sound sources; Presidential Decree no. 459 of 18 November 1998 - Regulation implementing article 11 of Law no. 459 of 26 October 1995. 447 on the subject of noise pollution deriving from railway traffic; Presidential Decree no. 459 of 18 November 1998 - Regulation implementing Article 11 of Law no. 447 of 26 October 1995 on noise pollution deriving from railway traffic; Ministerial Decree of 31 October 1997 - Methodology for measuring airport noise.

In order to protect health it is therefore important to limit prolonged exposure to all environmental pollutants, and to protect the most vulnerable through the particular protection of users in places such as residences, schools, buildings used for hospitals, clinics, nursing homes and sports and recreational activities, as highlighted also for other types of environmental exposure [68-70].

Energy and living comfort

This part, shown in Table 3, is divided into four sections: dimensional requirements of living spaces; thermo- hygrometric comfort; natural ventilation and controlled mechanical ventilation systems; energy efficiency of the building envelope. With the exception of this last point, for the description of the performance requirements and health impacts of the other sections, please refer to the article concerning the proposed update of the Ministerial Decree of 5 July 1975.

Energy efficiency of the building envelope

In recent decades, the achievement of certain standards of comfort in the inhabited environment has led to a continuous increase in energy consumption. Consumption is mostly satisfied through energy production systems that have high environmental impact on the, with direct and indirect effects on humans, even of particular magnitude (as with air pollution for example).

It is therefore necessary to reduce energy requirements and minimize energy consumption for winter heating and summer cooling, using the performance of the building's envelope and fixtures. It is also necessary to limit the summer overheating of buildings by reducing direct solar radiation inside the rooms, without counteracting the free energy supply from solar radiation in winter.

On the one hand, the creation of indoor environments that require extensive use of energy (for heating, cooling or lighting) contributes significantly to increasing the global demand for energy and consequently all impacts related to its production (air quality, climate change, etc.). Poor air quality, as already highlighted above, is linked to the increase in mortality mainly due to respiratory and cardiovascular causes, as well as to

Table 3 - Health performance targets for new buildings to be integrated in the *Regolamento Edilizio Tipo* (Building Code) - Energy and Comfort

Art. 13 Energy efficiency of the building envelope	**Performance targets**	• Reduce energy requirements and minimize energy consumption for winter air conditioning and summer cooling, while ensuring, at the same time, all the comfort and well-being requirements of users.
		• Promote the energy efficiency of the building, ensuring air exchange and indoor quality for the protection of the health of the occupants. Air changes must be studied in relation to energy insulation so as not to worsen all the other factors that play an increasingly important role (e.g. indoor air quality, discomfort, etc.).
	Performance	• Adopt shading devices for sun protection, which allow, during the summer period, to keep the building's glazed surfaces in the shade during the hottest hours of the day, with orientation from East to West, passing through South, in a percentage equal to 80%, thus reducing the thermal load and improving the internal comfort (reduction of the temperature of the glazed surfaces and anti-glare protection). At the same time, these devices should not penalize the contribution made by the glazing to natural lighting.
		• Provide for the installation of green roofs and walls, which help to lower indoor temperatures in homes, with consequent benefits in terms of energy consumption for air conditioning, air purification and, thanks to permeability, help to manage rainwater in a sustainable way.
		• Identify suitable thermal insulation strategies for the building, evaluating transmittance and thermal inertia of the materials. For the thresholds of the regulations, please refer to the technical legislation of the sector.
		• Limit condensation inside the rooms, through a proper detailed planning of the construction elements (waterproof layers, insulation, etc.).

the increase in the incidence of lung cancer even in non-smokers.

On the other hand, the presence of a largely obsolete building stock, over forty years old, makes it subject to considerable energy dispersion: older buildings consume on average three times more than new efficient ones, both for the type of materials used and for design reasons [71].

Excessive energy demand for heating and cooling leads to health impacts especially in the socio-economically disadvantaged groups, as they are often unable to meet this need, and cannot access adequate and reliable forms of energy at sustainable prices to meet basic needs, such as preparing food, heating, caring (energy poverty) [72].

The strong push towards the promotion of nearly zero-energy buildings could lead to potentially damaging health situations if not accompanied by appropriate measures to ensure satisfactory indoor air quality. In this respect, the European Union [73] stresses that, for nearly zero-energy buildings, the minimum requirements will have to take into account the general indoor climatic conditions in order to counteract possible negative effects, such as inadequate ventilation. In order to avoid deterioration of indoor air quality, well-being and health of the occupants of the European building stock, the gradual tightening of the minimum energy performance requirements, resulting from the Europe-wide implementation of the provisions for nearly zero-energy buildings, must go hand in hand with the implementation of appropriate indoor strategies.

Recovery, Management and Maintenance

This part, shown in Table 4, is divided into three sections: municipal solid waste management; water management and protection; and integrated building management.

Municipal Solid Waste Management

In developed cities the consumption of resources (water, materials) and the consequent production of waste has assumed such dimensions as to compromise the delicate balance between humans and nature, with direct consequences on the state of health and the

Table 4 - Health performance targets for new buildings to be integrated into the ***Regolamento Edilizio Tipo*** (Building Code) - Recovery, Management and Maintenance

Art. 14 Municipal solid waste management	**Performance targets**	• Guarantee suitable spaces for the management of solid urban waste through adequate planning strategies consistent with the managing body's methods of collection.
	Performance	• Within buildings for residential use identify specific spaces for the separate collection of waste. In residential use, waste products are most frequently collected during the day in the kitchen. It is therefore necessary that within the kitchen, or in its vicinity if there are ancillary rooms (storage room, terrace, etc.), there are spaces to collect the various containers for separate waste collection; • For outdoor spaces and common areas provide places, at a distance from the dwellings, that can be used for waste collection, or other solutions that are in accordance with the collection systems adopted by the public service operator and, at the same time, protect the citizen from any inconvenience, as specified below. • In the case of condominiums, where the waste deposit may be of a certain size, it is necessary to assess in advance which type of waste to deposit. The area must be equipped with water for cleaning and washing the containers and a system for collecting the relevant waste water. These spaces should be protected from the weather but ventilated so that in summer the temperatures are not too high and, where the door-to-door system is in operation, they should be located in such a way that they do not obstruct pedestrian and vehicular traffic. In the latter case, they must also be facing public roads and accessible on foot to public service operators.
Art. 15 Water management and protection	**Performance targets**	• Guarantee the reduction of water consumption and the achievement of the objectives of hygiene, health and sustainability through the reduction of wastage and the protection of the natural cycle of the resource, minimizing, when possible, the artificial cycle.
	Performance	• **Prepare the various documents that make up the Water Safety Plan**[3] (WSP): • Provide for the design and maintenance of appropriate systems to minimize hazards; • Identify hazards and hazardous events that are more likely to produce health damage. • **Reduction of drinking water consumption** Equipping the drinking water distribution system with water-saving systems and installing a meter for each housing unit or property. • Limit the consumption of drinking water to specific uses and to the quantities strictly necessary, avoiding consumption for different uses and installing systems to contain the quantities supplied (consumption limiters, diffusers, pressure limiters, etc.).

Used water recovery

• Carry out water balance taking into account the needs and volumes of water of various kinds (rainwater, food waste, domestic waste, drainage) that can be collected, recovered or discharged.

• Depending on how the recovered water is used, appropriate treatment must be ensured. The distribution network for this type of purified water must not be connected to the drinking water and its outlets must be marked "non-potable water".

• This water can be used for the irrigation of vegetable gardens and gardens, but not for the cultivation of vegetables and fruit to be eaten raw.

• Promote the natural absorption of rainwater that cannot be recovered (because it is difficult to collect) or that is in excess (for example during periods of increased rainfall). Discharges of domestic wastewater into surface water bodies or soil by sub-irrigation must be authorized by the Province and the Municipality respectively in accordance with Legislative Decree 152/2006, part three.

• Adopt strategies to reduce the speed of surface flow, to allow good absorption and re- introduction of rainwater, especially during periods of greatest inflow, creating, if possible, areas to slow runoff on the ground such as green areas and/or artificial drainage systems.

• Adopt natural type purification systems such as buffer-filter strips, grass channels, filters, infiltration basins for a preventive treatment of water runoff from potentially polluted covered surfaces (e.g. roads, driveways).

Wastewater management

• Connection to the public sewerage system is appropriate if the intervention falls within 50 meters of it. If this is not the case, a domestic waste water treatment plant should be installed. For dwellings, the discharge capacity is equal to the maximum number of people who can live there.

• Uncontaminated rainwater and drainage water from residential buildings, if not recovered or surplus to reuse, must be collected and piped, separately from other wastewater, to the natural or artificial network, with the ultimate aim of discharging it into surface water bodies in the area.

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[3] Lucentini L, Achene L, Fuscoletti V, Nigro DI Gregorio F, Pettine P. Linee guida per la valutazione e gestione del rischio nella filiera delle acque destinate al consumo umano secondo il modello dei Water Safety Plan. Rapporti Istisan 2014:21

Art. 16 Integrated building management	**Performance targets**	– Ensure that the performance defined at the design stage is maintained to prevent adverse health effects.
	Performance	– Prepare the various documents that make up the Maintenance Plan: • *User's manual*, which must contain instructions on the use of the most significant parts of the building, in particular the technological systems and the water system, as well as all information to limit as much as possible the damage resulting from its improper use; • *Maintenance manual*, which must contain all the necessary instructions for carrying out maintenance operations on the components and systems of which the building is made up, distinguishing between those operations that can be carried out directly by the user and those that require the intervention of specialized personnel; • *Maintenance program*, divided into: - Sub-program of benefits, which must list, for each requirement class, the performance provided by the building, its components and systems during its life cycle; - Sub-program of controls (planning periodic inspections), which will have to define the time schedule of the checks in order to detect the current performance level and place it (qualitatively and quantitatively) within the range having as extremes the test values and the minimum values normally used; - Sub-program of the interventions, which must report the time order of the programmed maintenance interventions and the maintenance strategies adopted for each single technical element (programmed, predictive, opportunistic maintenance, after failure).

possibility for people to satisfy their growing needs. In Italy in 2017, the national production of urban waste stood at just under 29.6 million tons, showing a significant decrease compared to 2016 (about 30.1 tons) [74].

Waste generation and management is an important determinant of environmental and health quality, as recognized by major international bodies, including WHO, but estimating potential health risks is a matter of great complexity and difficulty. Studies on the effects of exposure to various types of waste treatment and/or combustion plants [12, 75] reveal important indications of adverse effects on resident populations, although these are not conclusive on the causal side.

These studies mainly refer to long-term effects; there are several problems related to waste management at household level, especially if the organic waste is not removed daily or stored correctly.

They include:

- olfactory discomfort, due to the putrefactive processes of organic waste, with the emission of bad odours. Such odours attract flies, creating discomfort, as well as possible problems of food contamination.
- other pests, the presence of which varies according to the location of the building and the waste storage location (internal or external). They include:
- insects (e.g. cockroaches, ants, etc.),
- birds (e.g. pigeons, seagulls)
- or rodents (e.g. mice, rats, etc.) and other mammals (e.g. dogs, cats, boars, etc.).

In homes these infestations, especially if caused by small insects, are often underestimated, although their presence can damage food and be associated with allergic manifestations of varying degrees. Waste, together with the accumulation of poorly conserved

food, are areas in which parasites find nourishment and the optimal conditions to multiply. In buildings, there are several access routes, including electricity, water and gas pipes and communication cables, as these have large openings allowing entry. From these routes, pests generally have immediate access to the rest of a building [76].

In temperate areas, parasites such as mites and cockroaches can trigger allergic reactions. It is estimated that about 10- 20% of the population is potentially affected and excess moisture, accompanied by poor ventilation, increases the risk of exposure [77, 78]. Asthma is an allergic disease affecting more than 50% of adults and 80% of children [78]. In an urban environment, sensitization to parasites, including rodents, cockroaches and dust mites, is common among asthmatics of different ages [79]. However, awareness rates vary widely between cities and, within cities, between ethnic groups and neighborhoods, depending on the socio-economic level [80]. Despite uncertainties about quantitative thresholds, studies have shown a clear relationship between increased domestic exposure to allergens from cockroaches, mice and dust mites and increased risk of allergic sensitization and severe asthma.

Many problems are also complicated by the need to use pesticides to eliminate possible infestations. The most common routes of exposure to these products are dermal and inhalation, as well as accidental ingestion by children.

The waste must therefore be stored in clean, closed containers, which must be emptied regularly. In residential contexts, outdoor areas with pets should be properly maintained, with daily removal of faecal material and excess food.

Water management and protection

Water is a fundamental environmental resource for life: in fact, besides being the main component by weight (from 40 to 98%) of living matter, it is used by humans both to satisfy our own primary needs and for the production of goods (agricultural, industrial use, navigation, energy production, etc.).

It is of prime importance to protect and preserve the quality of surface water and groundwater present in the area, limiting water withdrawals from the soil and subsoil and avoiding waste, especially of drinking water which is of high quality and involves high production costs.

The increase in water consumption and the continuous increase in the amount of wastewater to be disposed of pose direct and indirect health risks. WHO has published several documents concerning the quality characteristics of water and its relevance for health protection [81, 82].

Water-induced health problems can be mainly biological and chemical in nature. Enteric pathogens can enter the water supply of buildings as a result of contamination of the external network, faults in internal plumbing systems, pipelines, poor hygiene at the points of use. In addition, pipelines may be subject to growth of environmental microorganisms, including potentially pathogenic species [83]. The scientific literature describes numerous water epidemics also in Italy, both bacterial and viral in nature [84, 85].

From a chemical point of view, water in buildings can be contaminated as a result of the release of substances from pipes or solder (e.g. copper, lead, nickel, cadmium, organostannic products, selenium, styrene, tin, vinyl and zinc chloride, etc.). In other cases, the problems arise from additional water treatments [81, 86-89].

Water shortage is a permanent condition that is particularly widespread in Italy and constitutes a not insignificant problem, although it is difficult to quantify. Among the main health consequences are all those related to poor personal, environmental and food hygiene. In 2018, about 10% of Italian households reported irregularities in the water supply service in their homes. This phenomenon, which concerns all regions to

varying degrees, affects almost 2,700,000 families. Of these, more than 65% live in the regions of Southern Italy. About 40% of families who complain about irregularities in water supply say that the problem occurs throughout the year [90].

Integrated building management

To guarantee the maintenance of building quality over time, defining the necessary maintenance activities to be carried out during the operation/management phase of the building.

The health repercussions of the absence or incorrect management of the building can be multiple, depending on the type of installation involved. For example, correct lighting [91] means the activities taking place in each room can be carried out in the best possible way, since each type of light has specific characteristics that make it useful for concentration, precision work, relaxation, safety perception, accident prevention; the hygienic-sanitary maintenance of air conditioning systems (from sanitization to restoration) is a prerequisite to avoid the possible spread of particulate matter or pathogens in the indoor environment [92]. Equally important is the maintenance of gas and electrical systems for the prevention of intoxication and/or fire. Informing the user can also guarantee that they behave suitably; take for example the importance of periodically airing out the rooms to guarantee the air changes necessary to lower the concentration of possible contaminants or avoid the formation of condensation mould.

Discussion and conclusions

Creating living environments capable of generating health not only requires the attention of Public Health professionals, but also implies integrating vision and objectives between different skills and competences, placing health at the centre of all policies, as WHO has long highlighted [93].

It follows that the quality of living environments depends essentially on the ability to "create synergies" between the natural environment, the built environment and sustainable mobility, paying particular heed to the social, functional and energy issues of the city and the impacts they generate on the health of residents [5, 21].

This is in line with the objectives set out in the Sustainable Development Agenda, which all UN member countries should implement by 2030. In particular, Objective 11 aims to *"Make cities and human settlements inclusive, safe, resilient and sustainable*", through the implementation of 7 sub-objectives ranging from access to housing, mobility, environmental quality, to local policies. These objectives are based on a vision of cities oriented towards environmental justice, a vision that involves a profound rethinking of values and the development model. This vision is based on the widely documented assumption that promoting actions oriented towards environmental justice, i.e. improving the most run-down areas of the city in order to reduce environmental inequalities (e.g. reducing pollution or social deprivation), can also contribute significantly to reducing health inequalities. Having rules that define precise performance objectives and performance targets for housing and the various areas of collective living, makes it possible to provide minimum standards to protect especially the most fragile sections of the population.

Therefore, an up-to-date, clear and unambiguous regulatory framework is a valid and indispensable tool for the protection of Public Health. As already pointed out above [5], in the Italian context this need is pressing due to the uncertainty and lack of coordination of many current regulations, especially in the building and urban planning sector, but also due to the abundance and contradictory nature of regulatory production.

This work can be seen as a contribution to simplifying and updating existing

legislation, in order to coordinate building and health regulations on the built environment as a single and fundamental Code for designers and Public Health operators.

Riassunto

Una proposta di standard igienico-sanitari per il nuovo Regolamento Edilizio Tipo in Italia

L'enfasi tradizionale della Salute Pubblica sul tipo e sulla qualità degli alloggi, ad oggi, si fonde con altri determinanti più ampi della salute quali: il quartiere, la comunità e il "luogo" in cui si trova una casa, ma anche le politiche che rendono possibile l'accesso a una casa sana e alla portata di tutti. Gli aspetti legati al contesto, su scala di quartiere, condizionano pesantemente la qualità interna e la reale agibilità degli edifici stessi. Ci si riferisce in particolare a fattori quali la qualità del sito, le relazioni tra edificio e contesto, la presenza e qualità del verde e degli spazi aperti circostanti l'edificio, nonché a tutte le misure che consentono di ridurre gli impatti dell'edificio sull'ambiente, di tutelarlo nei confronti dell'inquinamento ambientale, di gestire in modo integrata l'edificio, ai fini della sua manutenzione. Realizzare ambienti di vita in grado di generare salute vuol dire riferirsi alle diverse dimensioni suindicate, e ciò non richiede soltanto l'attenzione degli operatori di Sanità pubblica, ma implica un'integrazione di visione e obiettivi tra professionalità e competenze diverse che ponga la salute al centro di tutte le politiche.

La presente proposta, che parte dall'analisi dai regolamenti locali d'igiene esistenti e dalla letteratura scientifica, intende fare il punto su una serie di ambiti ritenuti fondamentali per la valutazione degli aspetti d'igiene edilizia, con particolare riferimento all'eco-sostenibilità delle costruzioni e all'adattamento ai cambiamenti climatici. Gli aspetti individuati possono essere considerati un punto di partenza per la predisposizione di regolamenti integrati di igiene ed edilizi basati su pratiche documentatamente efficaci ai fini della tutela della salute pubblica.

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