

## Balancing tourism and healthcare. Innovative strategies for the effectiveness of urban health systems in european cities

*Equilibrando el turismo y la atención sanitaria: Estrategias innovadoras para la eficacia de los sistemas de salud urbana en las ciudades europeas*

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### Abstract

*The rapid growth of urban tourism across European cities has placed mounting pressure on local healthcare systems, raising critical concerns about their ability to deliver effective and equitable services. This study investigates innovative strategies aimed at strengthening the resilience and efficiency of urban health infrastructures while addressing the complex challenges posed by mass tourism. Through a comparative analysis of selected European metropolitan areas, the research examines policy initiatives, digital health innovations, and public-private partnerships designed to balance the medical needs of both residents and visitors. The findings underscore the significance of adaptive planning, integrated emergency response mechanisms, and sustainable funding models in alleviating the strain on urban health services. The study concludes by presenting a strategic framework that promotes synergy between the tourism sector and healthcare delivery, ensuring long-term sustainability and equitable access in rapidly evolving urban environments.*

**Keywords:** overtourism; territorial healthcare; community hubs; sustainability

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### Resumen

*El rápido aumento del turismo urbano en las ciudades europeas ha ejercido una presión creciente sobre los sistemas locales de salud, generando preocupaciones respecto a su capacidad para ofrecer servicios eficaces y equitativos. Este estudio explora estrategias innovadoras para fortalecer la resiliencia y eficiencia de los sistemas de salud urbanos, al tiempo que aborda los desafíos que plantea el turismo de masas. A través de un análisis comparativo de ciudades europeas seleccionadas, la investigación examina intervenciones políticas, soluciones digitales en salud y asociaciones público-privadas orientadas a equilibrar las necesidades sanitarias de residentes y visitantes. Los hallazgos subrayan la importancia de una planificación sanitaria adaptativa, sistemas integrados de respuesta ante emergencias y modelos de financiación sostenibles para mitigar la presión sobre las infraestructuras de salud urbana. El estudio concluye proponiendo un marco estratégico que promueve la sinergia entre el sector turístico y la prestación de servicios sanitarios, garantizando la sostenibilidad y accesibilidad a largo plazo en contextos urbanos en constante evolución.*

**Palabras clave:** sobreturismo; sanidad territorial; nodos comunitarios; sostenibilidad

**Bloque temático:** CIUDAD. Análisis urbano, políticas y planificación

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## **1. Introduction**

### **2.1 Research background: growth of tourism in European cities, and the struggle of healthcare systems**

In recent decades, European cities have witnessed unprecedented growth in tourism, fueled by increased global mobility, the rise of digital booking platforms, and the allure of cultural heritage, gastronomy, and other urban experiences. While this growth has yielded considerable economic benefits for local economies, it has simultaneously imposed mounting pressure on urban infrastructure—particularly on public health services.

This contribution focuses on the impact of tourism flows on the accessibility and equity of urban healthcare systems. Popular destinations increasingly face challenges linked to overcrowding, rising demand for emergency medical services, and strain on public health resources. These pressures are further intensified by seasonal fluctuations, which create variable and often unpredictable patterns of healthcare demand, requiring cities to implement dynamic and adaptive healthcare strategies.

As urban planning paradigms increasingly incorporate principles of resilience and sustainability, it becomes crucial to examine the intersection between tourism growth and healthcare service efficiency to support the development of livable and health-conscious urban environments.

Overtourism significantly exacerbates pressure on urban health infrastructures. The arrival of large numbers of visitors can lead to overcrowded hospitals, elevated emergency care demand, and increased burden on health personnel and facilities. Emergency departments often experience seasonal surges in patient intake, largely due to tourist-related incidents such as accidents, heat exhaustion, and alcohol-related injuries.

A particularly illustrative example—discussed in more detail in the case studies section—is Venice, where healthcare provision has been severely challenged by the city's unique geographic constraints and the overwhelming number of visitors (Seraphin et al., 2018). This case exemplifies how territorial and infrastructural dynamics can heighten the vulnerability of urban health systems under tourism pressure.

Moreover, overtourism amplifies public health risks, particularly in densely populated tourist hotspots that can accelerate the transmission of infectious diseases. The COVID-19 pandemic starkly highlighted these vulnerabilities: cities such as Paris and Rome encountered major difficulties in managing transmission risks in heavily frequented urban areas (UNWTO, 2021).

Addressing these multi-layered challenges necessitates integrated urban health planning, with a focus on:

- Improved resource allocation and health infrastructure;
- Strategic emergency response models tailored to tourist influxes;
- And the development of sustainable tourism policies that strike a balance between economic growth and public health resilience.

Only through a holistic governance approach—which includes the integration of healthcare considerations into tourism and urban planning—can cities ensure that the benefits of tourism are not offset by systemic strain on essential public services.

#### **1.1. Objectives and research questions: challenges for healthcare services**

As tourism in European cities continues to grow, healthcare systems face increasing pressure to adapt to the fluctuating and often unpredictable demands of visitors: subsequently, the aim of this contribution is to analyze the challenges that urban healthcare services encounter due to mass tourism and explore

innovative strategies to enhance their resilience and efficiency. Key issues include the strain on emergency medical services, the seasonal variation in patient numbers, and the allocation of resources between residents and temporary visitors. Additionally, the study aims to investigate the financial burden of providing healthcare to uninsured or short-term visitors, as well as the role of public-private partnerships in addressing these gaps: a critical focus will be placed on cities such as Barcelona, Venice, and Amsterdam, where overtourism has led to significant disruptions in healthcare access and quality of urban living during touristic seasons (Capocchi et al., 2019). To guide this analysis, the research will address the following key questions:

- How does tourism impact emergency medical services and hospital capacity in European cities?
- What strategies have urban healthcare systems implemented to manage seasonal fluctuations in demand?
- What role can urban planning and policy play in mitigating the healthcare challenges associated with overtourism?
- How can cities balance the economic benefits of tourism with the need to maintain accessible and high-quality healthcare for residents?

Answering these questions will contribute to the development of sustainable health policies that align with broader urban resilience strategies, ensuring that healthcare services remain efficient and equitable in the face of growing tourism pressures.

## **2. Impact of Overtourism on Territorial Healthcare Services**

### **2.1 Overtourism's effects on quality and accessibility of healthcare**

Overtourism poses a significant threat to the quality and accessibility of healthcare services in European cities, where seasonal influxes of visitors often result in overcrowded hospitals, longer waiting times, and resource depletion—effects that disproportionately impact local residents (Gössling & Hall, 2019). This pressure is particularly acute in emergency departments, outpatient clinics, and general practitioner services, where the surge in patient volume frequently exceeds the operational capacity of urban health infrastructures.

Cities consistently exposed to high tourism volumes, such as Barcelona, report seasonal spikes in hospital admissions due to travel-related conditions, including heat exhaustion, alcohol-related injuries, and traffic accidents, often stemming from unfamiliar road systems. These increases lead to longer wait times, overburdened staff, and reduced availability of critical resources, thereby compromising care quality for both residents and tourists (WHO, 2021).

Access is further complicated by the displacement of local populations as a result of tourism-driven gentrification, which frequently prompts the relocation of medical services from central areas to peripheral zones. In Lisbon, for instance, escalating property values associated with short-term rental markets have forced the closure or transfer of key primary care facilities, limiting service reach for long-term residents. This spatial shift creates inequities in healthcare access, particularly when tourists—often privately insured—can access private clinics, while residents relying on public systems face mounting barriers to timely care (European Observatory on Health Systems and Policies, 2021).

Moreover, when uninsured or underinsured visitors require emergency treatment, the financial burden on public hospitals increases, exacerbating budgetary constraints and contributing to material shortages. These pressures are compounded by another critical issue: workforce fatigue. In tourist-heavy areas, medical staff are often confronted with excessive patient loads, extended working hours, and elevated stress levels, with insufficient reinforcements to meet seasonal surges. This leads to deteriorating service delivery and a rise in attrition rates among healthcare professionals (UNWTO, 2022). The cumulative effect is a weakened healthcare system, less capable of responding to routine demand fluctuations or future public health emergencies (WHO, 2021).

To address these complex challenges, urban policy must prioritize the harmonization of tourism development with the sustainability of health service provision. This includes:

- Strategic investments in health infrastructure;
- Adoption of flexible staffing models to accommodate seasonal shifts;
- Enhanced cooperation between public and private care providers to better distribute service responsibilities.

Such measures are essential to mitigate the negative effects of overtourism on urban healthcare systems. Without targeted and integrated policy interventions, the continued strain will undermine both quality and equity in service delivery, ultimately threatening the livability of affected cities for both residents and visitors (Gössling & Hall, 2019).

## **2.2 Seasonal variations and disparity in access to care for residents and tourists**

Seasonal tourism exerts a considerable impact on medical infrastructures in high-demand destinations, often resulting in disparities in access to healthcare services between residents and visitors. During peak tourist seasons, local health systems face surges in demand that strain clinical resources and compromise service quality and timeliness.

Empirical evidence from Italy, based on emergency department (ED) admissions during and after the COVID-19 pandemic, demonstrates that tourists accounted for a significant proportion of visits in high-tourism periods. This influx contributed to increased workloads for healthcare personnel and created the risk of delayed care provision for both residents and non-residents (Peeters et al., 2021).

Similarly, the Overtourism Index developed by Evaneos and Roland Berger assessed the effects of tourism pressure on hospital performance across Europe. Findings show that seasonal peaks can undermine service availability for locals, leading to growing dissatisfaction and perceived inequities in care delivery. These patterns underscore the urgent need for targeted policy interventions that address peak-period demand to ensure equitable access and sustained healthcare quality.

Seasonal variations disproportionately affect specific types of healthcare services, necessitating dynamic adjustments in resource allocation. Adaptive measures—such as flexible staffing, real-time capacity management, and seasonally responsive infrastructure planning—are essential to prevent service bottlenecks and maintain equitable care access during high-demand phases.

The COVID-19 pandemic further intensified these dynamics, introducing unprecedented disruptions to global tourist flows. In the immediate aftermath, the collapse in visitor numbers offered temporary relief to overstretched local systems. However, the resurgence of tourism in the recovery phase has reignited pre-existing challenges, particularly in destinations where overtourism remains a persistent concern.

Additionally, the pandemic illuminated public perceptions of tourism-related health risks. A recent study revealed that residents in tourist-heavy destinations reported heightened anxiety, primarily due to concerns over virus transmission, and experienced additional stress resulting from increased pressure on healthcare resources (Caporale et al., 2023). These perceptions reflect a broader tension between economic revival through tourism and the imperative to protect public health and healthcare equity.

In response, cities are increasingly turning to technological innovation and crisis management tools to address these challenges. From predictive analytics to crowd-monitoring systems and AI-driven triage platforms, smart technologies offer promising pathways to balance tourism management with health system resilience (Caporale et al., 2023).

In conclusion, the post-COVID context presents a unique opportunity—and imperative—to reconfigure how cities manage seasonal fluctuations in tourist arrivals. Policymakers must adopt adaptive planning models, strengthen community engagement, and promote the integration of technological solutions to

ensure that both residents and visitors have equitable access to timely, high-quality care without compromising the long-term sustainability of urban healthcare infrastructures (European Commission, 2022; Ministero della Salute, 2022).

## **2.3 Addressing increasing demand and service depletion**

The increasing pressure that tourism exerts on urban healthcare systems necessitates the development of comprehensive, multi-sectoral strategies that integrate policy innovation, technological advancement, and resource optimization. In cities with high tourist densities, the convergence of seasonal population surges and existing healthcare demand risks overwhelming public services and exacerbating inequalities in access to care.

A central component of such strategies is the adoption of smart health systems, which leverage digital technologies to monitor patient flows, predict seasonal demand peaks, and support dynamic resource allocation. These systems enable healthcare providers to optimize both routine service delivery and emergency preparedness, contributing to overall system resilience (EIT Health, 2022).

Equally important is the development of dedicated healthcare services for short-term visitors, including tourist-specific clinics. In this context, public-private partnerships (PPPs) have demonstrated effectiveness in alleviating pressure on public hospitals. By allocating non-resident care primarily to private providers, cities can preserve emergency and primary services for local populations without compromising visitor health needs (Milano et al., 2022).

From a regulatory perspective, the enforcement of mandatory travel health insurance and the promotion of international cost-sharing agreements have emerged as viable mechanisms for mitigating the financial burden on municipal health budgets. Some cities have implemented policies requiring proof of medical insurance upon arrival, thus ensuring that tourists contribute to the healthcare resources they may utilize (Capocchi et al., 2019).

Urban planning measures are equally instrumental in safeguarding healthcare infrastructure. Strategies such as visitor caps, crowd control policies, and tourist dispersion initiatives help to reduce congestion in high-density zones, particularly those located near critical medical hubs. Promoting access to alternative tourist destinations beyond historic centers distributes visitor flows more evenly across urban and suburban spaces, reducing the frequency of health-related incidents concentrated in core districts (Milano et al., 2021).

The importance of intersectoral coordination—particularly between local governments, tourism operators, and healthcare providers—was unequivocally underscored during the COVID-19 pandemic. Cities with established emergency protocols and integrated response networks proved more capable of maintaining healthcare system stability while addressing tourist-related needs (UNWTO, 2021).

Addressing the health-related consequences of overtourism requires a holistic governance approach that reconciles economic objectives with public health imperatives. By investing in smart technologies, enforcing health policy regulations, and implementing innovative urban planning, cities can build sustainable, inclusive, and resilient healthcare infrastructures capable of adapting to both current and future challenges in urban tourism management.

## **3. Innovative strategies for effective and sustainable urban healthcare**

### **3.1. Approaches and Governance Models**

Effective policy approaches and governance models are fundamental to ensuring that health systems operate efficiently, equitably, and sustainably. These frameworks shape how decisions are formulated, implemented, and monitored, directly influencing the quality, accessibility, and resilience of healthcare services (European Observatory on Health Systems and Policies, 2021).

In the policy domain, strategies encompass both governmental and organizational actions aimed at achieving specific public health outcomes. One notable direction is the adoption of multidisciplinary care models, which address access barriers to medical practitioners and improve chronic disease management. This approach involves a transition from traditional fee-for-service models to blended payment schemes, which incentivize collaborative healthcare delivery. While these reforms have been welcomed by nursing and allied health professionals, some physician organizations have raised concerns about potential fragmentation of care and increased operational costs (Ferlie et al., 2013).

Another significant policy focus is the enhancement of preventive care through effective health data sharing. The United Kingdom, for instance, is leading international efforts to shift from a treatment-centered to a prevention-oriented health system by promoting strategic uses of health data (Hanratty, 2024). Utilizing data from multiple sources enables the development of initiatives such as value-based reimbursement, population health management, and precision medicine. However, disparities in cultural, legal, and privacy norms across countries present major challenges, highlighting the need for a global consensus to fully realize these innovations.

In parallel, governance models define the institutional structures and processes through which health-related decisions are made and executed. The European Observatory on Health Systems and Policies plays a key role in supporting evidence-based policymaking by working with national authorities to advance objectives related to health outcomes, efficiency, quality, and transparency (European Observatory on Health Systems and Policies, n.d.).

Implementing successful reforms requires substantial investment and a reconfiguration of public health and social care infrastructures. Models that balance centralized leadership with local autonomy—such as the United Kingdom's approach of setting national priorities backed by strong leadership—have shown mixed results. While improvements have occurred in certain areas, this model has also led to unintended consequences, including data manipulation and a compliance-driven culture that can stifle innovation (Flynn, 2004). These outcomes underscore the importance of embedding local collaboration and professional engagement within governance frameworks to support sustainable progress.

The integration of digital health solutions and telemedicine is increasingly becoming a cornerstone of modern healthcare governance. Across Europe, cities are leveraging digital technologies to improve system accessibility and operational efficiency (EIT Health, 2022; Gemeente Amsterdam, 2022). These tools are essential not only for enhancing care delivery but also for reinforcing health system responsiveness to shifting demographic and epidemiological demands.

In conclusion, the continuous development and adaptation of policy frameworks and governance structures are critical for advancing healthcare systems. To remain resilient, responsive, and inclusive, these models must evolve alongside emerging challenges such as workforce shortages, technological innovation, and changing population health needs, ensuring the delivery of high-quality, accessible, and sustainable care (Waring, 2007).

### **3.2 Digital Health and Smart Technologies**

Urban planning plays a pivotal role in ensuring that cities provide accessible, efficient, and equitable healthcare services. In this context, the integration of digital health and smart technologies into urban design has become essential for building resilient, data-driven health systems that enhance public welfare (World Health Organization, 2021).

Several strategic approaches support this integration. Cities can invest in smart hospitals and health hubs equipped with telemedicine services, AI-powered diagnostic tools, and remote patient monitoring systems. Establishing digital health access points—such as kiosks in community centers, transportation hubs, and public buildings—enables both residents and tourists to access virtual consultations, digital prescriptions, and other e-health services with ease (EIT Health, 2022; Gemeente Amsterdam, 2022).

To prevent the digital divide, especially among elderly populations and low-income communities, urban planners must ensure that digital health solutions are universally accessible. This includes providing public Wi-Fi zones, subsidizing access to telemedicine, and implementing inclusive digital health literacy programs, thereby promoting equitable use of remote diagnostics and e-health tools.

Moreover, digital technologies can significantly enhance emergency response systems. For example, AI-powered traffic management can prioritize ambulances and medical transport, reducing response times and improving patient outcomes (European Observatory on Health Systems and Policies, 2021). Smart mobility solutions, such as app-based public transportation tracking, also help patients reach healthcare facilities more quickly and efficiently.

The COVID-19 pandemic highlighted the urgency of creating adaptive urban health infrastructures. In response, urban planning must incorporate modular healthcare spaces, telemedicine-equipped isolation centers, and AI-driven disease surveillance systems to enhance crisis response and pandemic preparedness (UNWTO, 2021).

Creating truly integrated digital health ecosystems also requires collaboration between governments, healthcare providers, and technology companies. Partnerships with AI-based diagnostic firms and wearable tech developers can support city-wide health monitoring programs and real-time public health interventions (Ministero della Salute, 2022).

By embedding digital health technologies into urban planning, cities can improve healthcare accessibility, optimize resource distribution, and bolster public health resilience. Looking to the future, urban policies must prioritize technological integration, promote digital equity, and invest in smart infrastructure to ensure urban health systems remain efficient, inclusive, and adaptable to emerging challenges (Waring, 2007).

### **3.3. Public-Private Partnerships in Healthcare: models for social services integration**

Integrating digital health solutions and smart technologies into urban planning, in combination with public-private partnerships (PPPs), can significantly enhance the accessibility, efficiency, and equity of healthcare services in urban environments. This holistic approach leverages technological advancements and collaborative frameworks to develop resilient, data-driven health systems that promote public welfare (World Health Organization, 2021). PPPs play a crucial role in strengthening community hubs by integrating essential social and medical services into accessible, multifunctional spaces. By combining public sector oversight with private sector innovation and efficiency, these partnerships expand healthcare infrastructure, optimize resource allocation, and facilitate the introduction of innovative care models (European Observatory on Health Systems and Policies, 2021). Community hubs particularly benefit from PPPs through the integration of telemedicine services, mental health support, elderly care programs, and digital health innovations (EIT Health, 2022). A noteworthy example is Italy's PNRR-funded Case della Comunità (Community Houses), which provide integrated primary care services through multi-professional teams, while engaging private stakeholders in the deployment of technology and service delivery (Ministero della Salute, 2022). Similarly, the United Kingdom's Integrated Care Systems (ICSs) foster collaboration between public health services, private providers, and community organizations to enhance patient-centered care and improve service accessibility (Ferlie et al., 2013). These partnerships enable sustainable financing models, accelerate digital transformation, and support workforce training initiatives, ensuring that community hubs evolve into dynamic centers for preventive healthcare, chronic disease management, and social inclusion (McGivern, Nzinga, & English, 2017). By fostering cross-sector collaboration, PPPs contribute to the strengthening of urban health systems, alleviate pressure on hospital services, and promote healthcare equity at the local level (Waring, 2007).

#### 4. Case studies for European cities

As tourism in European cities continues to rise, the strain on urban healthcare systems has become an increasing concern. Popular destinations like Barcelona, Amsterdam, and Venice experience seasonal surges in healthcare demand, driven by millions of visitors requiring emergency services, routine medical care, and specialized treatments. The influx of tourists can overwhelm local hospitals, emergency response units, and primary care facilities, leading to resource depletion and longer waiting times for both visitors and residents. To address these challenges, cities have implemented innovative strategies, including smart healthcare solutions, public-private partnerships, and digital health technologies, to enhance accessibility and efficiency. The following case studies explore how Barcelona, Amsterdam, and Venice are adapting their healthcare systems to balance the needs of residents and tourists while ensuring sustainable, high-quality medical care in high-tourism urban environments.

##### 4.1 Barcelona: Managing Healthcare Demand in a Tourist Hub

Barcelona, one of Europe's top tourist destinations, experiences intense seasonal fluctuations in healthcare demand, particularly in its historic districts and coastal areas. The influx of tourists increases the burden on emergency services, hospitals, and primary care facilities, often leading to longer waiting times and resource constraints: non-resident patients accounted for 15% of emergency visits in key hospitals during peak tourist seasons. To address this challenge, Barcelona has implemented urgent care centers (CUAPs) strategically located in high-tourism areas, providing 24/7 medical assistance to both residents and visitors; additionally, the city promotes telemedicine services through its Salut Respon 061 platform, offering remote consultations and medical guidance to ease hospital congestion (Generalitat de Catalunya, 2023). Public-private partnerships have also played a role, with collaborations between the Barcelona Medical Tourism Agency (BMTA) and local healthcare providers ensuring that private clinics help absorb tourist healthcare demand; moreover, the impact of tourism on Barcelona's healthcare infrastructure has been extensively analyzed, highlighting the need for adaptive urban health policies (WHO, 2021).



**Fig. 1** Summary diagram of healthcare services management in Barcelona, Spain

#### 4.2 Amsterdam: Smart Healthcare Solutions for Tourists and Residents

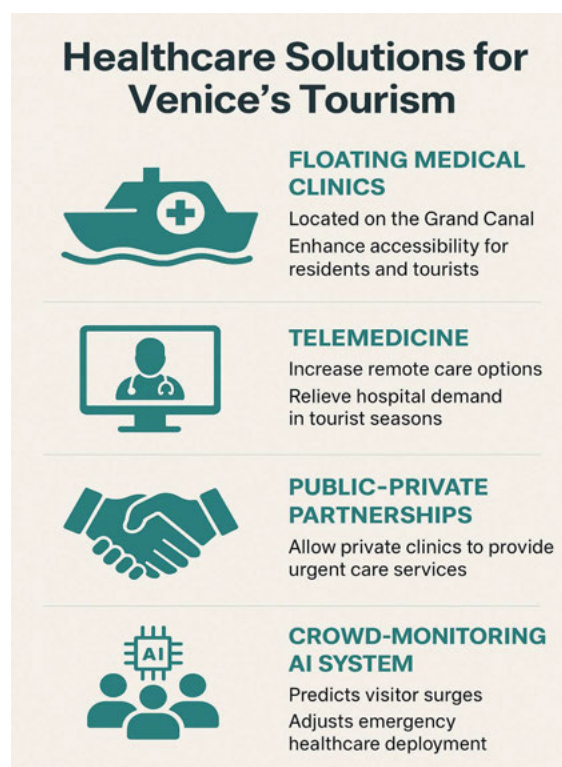
Amsterdam has embraced digital health and smart city solutions to enhance healthcare services for both tourists and residents. With over 20 million visitors annually, the city faces challenges related to alcohol- and drug-related emergencies, particularly in areas like Leidseplein and the Red Light District (Spruit et al, 2022 ). The strain on emergency departments is further exacerbated by seasonal tourism pressure, necessitating innovative healthcare strategies: to improve healthcare access, the Amsterdam Public Health Service (GGD Amsterdam) has introduced mobile health units and AI-driven predictive analytics to anticipate spikes in emergency cases and deploy medical staff accordingly (European Observatory on Health Systems and Policies, 2021). The city also utilizes telehealth kiosks in hotels and transit hubs, allowing visitors to consult doctors remotely and reducing unnecessary hospital visits, a model that aligns with broader European trends in digital health innovation (EIT Health, 2022). Moreover, Amsterdam has experimented smart ambulance routing systems, using AI to optimize emergency response times by navigating traffic congestion, ensuring more efficient healthcare delivery in high-density urban zones (Gemeente Amsterdam, 2024). These measures exemplify how technology-driven healthcare models can enhance efficiency, reduce hospital strain, and improve accessibility in high-tourism urban environments.



Fig. 2 Summary diagram for the healthcare services management in Amsterdam, Netherlands

#### 4.3 Venice: Addressing Healthcare Challenges in a High-Tourism City

Venice, with its historic infrastructure and limited healthcare facilities, faces unique challenges due to the seasonal influx of over 25 million tourists annually: the city's reliance on boat ambulances and its aging local population make healthcare accessibility a pressing concern (Bertocchi et al., 2019). The strain of mass tourism on emergency medical services is well-documented, with hospitals experiencing seasonal spikes in demand due to both visitor-related incidents and the healthcare needs of residents (ibidem). The Veneto Region Health Authority has responded by establishing floating medical clinics on the Grand Canal and increasing telemedicine adoption for both residents and tourists, aligning with broader European strategies for smart healthcare integration (European Observatory on Health Systems and Policies, 2021). Additionally, the city has expanded its public-private healthcare partnerships, allowing private clinics to provide urgent care services to tourists, thereby reducing pressure on public hospitals (Osservatorio cronicità, 2021). Venice is also piloting a crowd-monitoring AI system, which predicts peak tourist congestion and adjusts emergency healthcare deployment accordingly, a technological approach that mirrors strategies seen in other high-tourism cities (ibidem). These measures are critical for ensuring that healthcare services remain efficient despite the city's unique logistical constraints, contributing to a more resilient urban health system (UNWTO, 2021).



**Fig. 3** *Healthcare management solution for tourism - related challenges in Venice, Italy*

## **5. Strategic Framework for Sustainable Healthcare in Tourist Cities**

### **5.1 Integrated Health Planning and Resource Allocation**

The dynamic interplay between fluctuating population densities in touristic cities and rising healthcare demand calls for a strategic, integrated approach to health planning and resource allocation. As highlighted in the analyzed case studies, a sustainable healthcare framework must prioritize the equitable distribution of medical services, leveraging telemedicine, modular healthcare units, and interoperable health information systems to improve responsiveness.

Strategic resource allocation should also align with urban resilience principles, ensuring that emergency preparedness, healthcare workforce distribution, and public-private partnerships optimize service delivery during both peak tourist influxes and off-season periods. By embedding health planning within broader urban sustainability initiatives, cities can develop resilient and adaptive healthcare systems that address the needs of both tourists and local populations while mitigating resource strain.

Data-driven strategies play a crucial role in enabling real-time adaptability of urban health systems, optimizing both emergency response and routine care. For instance, Barcelona has implemented GIS-based healthcare mapping to strategically locate urgent care centers (CUAPs) in tourist-dense areas. This approach ensures that hospitals remain available for critical cases while reducing wait times for non-emergency patients. During peak seasons, non-resident emergency visits account for up to 15% of hospital admissions, making targeted placement of facilities vital for maintaining service quality (Mueller et al., 2020). The city's Salut Respon 061 telemedicine platform further supports triage and reduces hospital congestion through remote medical consultations.

Similarly, Amsterdam has used municipal health data to develop flexible staffing models that increase emergency room capacity during high-tourism periods while preserving care continuity for residents. By applying AI-powered predictive analytics, the city anticipates spikes in alcohol- and drug-related emergencies—particularly in nightlife districts—and allocates additional medical personnel accordingly.

(Spruit et al., 2022). The integration of smart ambulance routing systems also enhances emergency response by navigating traffic congestion efficiently, improving patient outcomes and reducing hospital strain (Gemeente Amsterdam, 2022).

Venice, with its unique logistical challenges due to historic infrastructure and reliance on boat ambulances, has adopted an AI-driven crowd-monitoring system to forecast peak tourist congestion. This anticipatory planning allows for dynamic emergency healthcare deployment. The city has also expanded access through floating medical clinics along the Canal Grande, offering timely urgent care to both residents and visitors without overwhelming the limited hospital infrastructure.

Beyond individual case studies, broader urban health frameworks, such as the UK's Integrated Care Systems (ICSs), show how predictive modeling and digital governance can optimize service delivery, workforce allocation, and ensure equity across metropolitan healthcare systems (EIT Health, 2022).

Ultimately, by embedding anticipatory planning and digital health solutions into urban development policies, cities can create resilient healthcare systems that adapt to changing tourism trends while continuing to provide high-quality care for all.

## **5.2 Enhancing Emergency and Preventive Healthcare Services: Community Hubs and the National Recovery and Resilience Plan (PNRR) Model**

The strain on emergency services, hospitals, and primary care facilities in tourism-intensive cities often results in overcrowding, resource depletion, and reduced access to healthcare for local residents. To address these issues, innovative healthcare models that prioritize decentralization and accessibility are essential.

One such model is Italy's Case della Comunità (Community Houses), a cornerstone of the country's National Recovery and Resilience Plan (PNRR). These multidisciplinary healthcare hubs aim to:

- enhance primary and preventive care,
- reduce hospital congestion,
- ensure equitable access to healthcare for both residents and tourists.

By integrating the model of Case della Comunità into urban health planning, cities can establish a more sustainable and resilient healthcare framework, capable of absorbing the impact of overtourism. These hubs offer a comprehensive range of services, including telemedicine consultations, diagnostic screenings, and coordinated care for patients with chronic conditions. Their focus on early intervention and preventive strategies alleviates pressure on emergency departments, which often face patient surges during peak tourist seasons.

The model's implementation in tourism-driven cities also ensures that non-emergency cases are managed locally, helping to prevent unnecessary hospital admissions. Mass tourism frequently leads to long wait times and overburdened emergency services, particularly in historic centers and tourist hotspots (Milano et al., 2021). By decentralizing healthcare services and establishing satellite facilities in less congested urban and suburban areas, the Case della Comunità model helps distribute patient demand more evenly, avoiding bottlenecks in central hospitals.

This strategy aligns with broader urban management goals, such as promoting alternative destinations outside city centers and implementing smart mobility solutions to improve access to care across the metropolitan area (European Observatory on Health Systems and Policies, 2021). Furthermore, these hubs support public-private collaboration, allowing private clinics to absorb part of the seasonal tourist healthcare load, thus reducing strain on public hospitals.

The integration of digital health tools—such as telemedicine platforms and mobile health applications—further enhances accessibility for both locals and tourists, enabling remote consultations and minimizing unnecessary in-person visits (EIT Health, 2022).

Incorporating a model like the Case della Comunità into urban planning and healthcare policy empowers cities to build resilient, equitable, and efficient healthcare systems. This not only improves access and care quality but also contributes to a more sustainable approach to managing the effects of overtourism on urban infrastructure and public services.

### **5.3 Sustainable Models for Urban Healthcare: Decentralization of Services in Satellite Neighborhoods**

As stated in the last part of the previous paragraph, a sustainable long-term strategy for healthcare in tourism-driven cities is decentralization, which redistributes medical services beyond overcrowded historical centers to alleviate pressure on core healthcare facilities. Cities such as Paris and Amsterdam have successfully invested in satellite healthcare centers in peripheral districts, ensuring that both residents and tourists can access essential services without overburdening hospitals in high-traffic areas (European Observatory on Health Systems and Policies, 2021).

Decentralization also helps mitigate the seasonal strain caused by tourism, as demonstrated in Barcelona, where strategically located urgent care centers (CUAPs) manage fluctuating patient demand effectively. This strategy is reinforced by smart mobility solutions, such as AI-driven public transportation planning and app-based navigation tools, which help patients reach healthcare facilities more efficiently. For instance, Amsterdam has implemented a smart ambulance routing system that optimizes emergency response times by navigating traffic congestion, ensuring timely medical attention for both tourists and residents (Gemeente Amsterdam, 2022).

In cities with unique geographical challenges, like Venice, the expansion of telemedicine services has significantly improved accessibility. Telemedicine reduces unnecessary hospital visits while maintaining high-quality care. Digital health initiatives, such as Barcelona's Salut Respon 061 platform, provide remote consultations and medical guidance, easing emergency department congestion. Similarly, the UK's Integrated Care Systems (ICSs) illustrate the benefits of coordinated healthcare networks that leverage telehealth and digital diagnostics to enhance service delivery and patient management (EIT Health, 2022).

Moreover, public-private partnerships have facilitated the expansion of digital health solutions, ensuring equitable access to telemedicine for both tourists and underserved populations (Ministero della Salute, 2022).

Drawing from these case studies, it is evident that integrating decentralization with smart mobility and telemedicine contributes to the development of resilient healthcare infrastructures. These infrastructures can adapt to seasonal demand fluctuations. Ultimately, technological innovation, strategic urban planning, and collaboration between public and private sectors will be crucial to maintaining sustainable, efficient, and accessible healthcare systems in tourism-intensive urban environments (World Health Organization, 2021).



Fig. 4 Summary diagram of sustainable models for urban healthcare systems

### Conclusions: expected outcomes and policy implications

This contribution is expected to generate valuable insights into the decentralization of healthcare services, with a focus on two key areas: the adoption of community hubs modeled after Italy's Case della Comunità, and the enhancement of telemedicine within welfare-related governance strategies.

By analyzing the implementation and impact of decentralized healthcare structures, the research has identified key factors that contribute to more accessible, efficient, and patient-centered care. Among the expected outcomes is a clearer understanding of how community-based healthcare hubs can:

- improve service delivery,
- enhance coordination among healthcare providers
- reduce disparities in access to care, especially for vulnerable populations.

The study also explores how telemedicine can complement decentralized models by offering innovative solutions for remote patient monitoring, specialist consultations, and chronic disease management.

The policy implications of these findings are significant. First, they support healthcare reform by demonstrating the benefits of transitioning from centralized, hospital-based systems to more distributed networks of community health hubs. This may lead to policy recommendations for the establishment and expansion of such hubs, with appropriate funding, staffing, and integration into national and regional healthcare systems.

Second, the research underlines the need for regulatory and technological advancements to optimize telemedicine. This includes:

- upgrading digital infrastructure,
- training healthcare professionals
- ensuring equitable access to virtual care.

Crucially, integrating these strategies into urban planning is essential. Decentralized care and telemedicine require attention to infrastructure, public transportation, and the geographic placement of community hubs to ensure universal accessibility. Urban policies should promote multi-functional community spaces that combine healthcare with social services, housing assistance, and wellness programs. This includes repurposing existing buildings, co-locating services, and ensuring proximity in both urban and suburban areas.

In addition, smart city technologies can support telemedicine through:

- high-speed internet access,
- digital kiosks for virtual consultations
- integrated data systems for seamless communication between providers and patients.

Beyond government efforts, these findings can guide healthcare providers, technology developers, and community organizations in creating more adaptive and patient-centered healthcare ecosystems. Policymakers can use these insights to design strategies that strengthen local healthcare resilience, enhance continuity of care, and ensure decentralized healthcare models are scalable and sustainable.

Ultimately, this contribution aims to bridge the gap between research and implementation, offering a roadmap toward a more equitable, efficient, and integrated healthcare system, aligned with broader goals of urban development and community well-being.

### **1. Community Health Hubs**

- Inspired by Italy's Case della Comunità
- Enhance local care access, especially for vulnerable populations
- Improve coordination among providers
- Support chronic disease management

### **2. Telemedicine Integration**

- Complements decentralized models
- Enables remote monitoring & specialist consultations
- Reduces pressure on hospital-based care
- Requires digital infrastructure & professional training

### **3. Policy & Governance Implications**

- Shift from centralized to distributed care networks
- Fund and integrate hubs into regional frameworks
- Ensure equity in digital access to virtual care
- Address regulatory gaps in telehealth delivery

### **4. Urban Planning Synergies**

- Locate hubs in walkable, connected areas
- Co-locate with social & wellness services
- Leverage existing infrastructure
- Use smart city tech (e.g., kiosks, broadband, data sharing)

## 5. Stakeholder Roles & Resilience

- Public-private collaboration to scale digital health
- Providers & tech developers shape adaptive ecosystems
- Policymakers bridge research and implementation
- Aim: equity, continuity, and sustainability in care

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