



Artificial Intelligence and the Administrative Side of Public Healthcare

Clinical applications of AI in healthcare are very promising, although many ethical, legal, organizational, and governance issues need to be addressed. Below, we provide a general introduction to AI in healthcare and identify some administrative applications that could be implemented relatively quickly, with significant benefits in terms of efficiency and effectiveness, and in compliance with the law. Our recommendation is to proceed with local experimentation and public-private collaboration.

ARTIFICIAL INTELLIGENCE//HEALTHCARE//ADMINISTRATIVE FUNCTIONS//PUBLIC PROCUREMENT//PERSONNEL MANAGEMENT

**GIULIANA BENSA**

is the Administrative Director of the Socio-Health Authority, Santi Paolo e Carlo, Lombardy Region

GIOVANNI FATTORE

is Professor at the Department of Social and Political Sciences, lecturer at SDA and researcher at CERGAS (Centre for Research on Health and Social Care Management) and Dondena (Centre for Research on Social Dynamics and Public Policy), Bocconi University.

There is no doubt that technological innovation in the digital domain is accelerating, and that applications of artificial intelligence (AI) could have a profound impact on society. The future holds the prospect of a different way of life from the one we know today, with potential changes in the way we are citizens (e.g., how we engage in political life or use public services), consumers (digital marketing, already a reality, will continue to evolve), and workers (we can expect further automation and a major redefinition of job skills). While technological innovation advances rapidly, its practical adoption lags behind.

But sooner or later, radical change will happen. In fact, it's unlikely that cultural, organizational and political resistance will be able to stop a

system of businesses, both local and global, from investing in applications that can boost productivity, improve the quality of products and services, and hopefully contribute to solving major global problems such as the risk of pandemics or a warming climate. Conversely, these innovations also pose major risks: security, manipulation of behavior, the harms of monopolistic concentration, and even the apocalyptic scenario of a world where machines rule humans. For all these reasons, public governance of AI, i.e. rules that balance the potential for innovation and risk mitigation, is being considered in many countries.

Within this overall framework, our paper offers a contribution on a concrete topic: the use of AI in public health, specifically in administrative functions. The aim here is to present the very real potential of AI in a specific area (which has a scope that goes beyond public health), and to discuss the relative opportunities and conditions for successful implementation.

AI IN HEALTHCARE

AI is particularly promising in medicine and healthcare because the diagnostic-therapeutic process is essentially informational in nature. When doctors take a patient's medical history, they are gathering information from that person; when they prescribe tests, they are doing so to obtain information to make a diagnosis; and based on the diagnoses, which are a list of conditions (a kind of catalog), they decide on a treatment, which in turn they have chosen based on information produced by the scientific community and interpreted on a case-by-case basis.

Some AI applications in medicine are at a very advanced stage (Bohr & Memarzadeh, 2020). Perhaps the clinical area with the most concrete potential is radiology. It's not hard to imagine that a well-trained machine could detect an abnormality as well as or even better than a radiologist, mainly thanks to the quantity and quality of the data used for training. Indeed, several studies show

encouraging results, although there is no shortage of controversy. Other noteworthy areas where AI research is making great gains include cardiology, neurology, some genetic diseases, and dermatology.

However, several experts caution against easy optimism about the use of AI in clinical settings (Davenport & Kalakota, 2019). There are questions about access to data of sufficient quality and quantity to train machines (Ferryman et al., 2023), and salient legal questions remain unresolved, including liability for potential errors (Morley et al., 2020). Moreover, the importance of the physician-patient relationship as an indispensable component of the care process continues to be emphasized and, not least, strong professional resistance has been noted, particularly from physicians themselves (Davenport & Glaser, 2022). All these factors could lead to a significant time lag between the availability of new technological applications and their implementation. For this reason, we decided to present an area that has been less explored, but that we believe has more potential for success in concrete implementations: back-office administrative functions.

THE ITALIAN PUBLIC HEALTH SECTOR AND ADMINISTRATIVE STAFF

In Italy, approximately 75% of healthcare spending is publicly funded through the National Health Service (SSN in Italian). Healthcare services are provided by local public authorities and independent hospitals (public and accredited private healthcare clinics). The public Local Health Authorities (ASL in Italian), about 250 in total, have an average of 3,000 to 4,000 employees and can reach a turnover of 1 billion euros. Due to the size and complexity of these ASLs, they need the support of administrative and management services that function smoothly to ensure efficient operations. Of the approximately 703,000 permanent employees in the SSN, about 63,000 serve in administrative functions.

The dynamics, in terms of total staff and

administrative staff, have varied considerably over time. While there has been a steady decline in total staff for more than ten years, with a strong recovery in 2020/2021 that brought the number back to 2013 levels, administrative personnel experienced a 20% drop over the same period, mainly due to a failure to replace retiring staff. On the one hand, this figure can be read as the result of an efficiency policy on the administrative side, thanks in part to the progress of digitalization in public health.

On the other hand, this decline highlights the significant increase in the average age of the workforce, which on average is 52 plus. The issues of age and skill trends will be addressed later. For now, suffice it to say that the use of digital technologies in general and AI applications in particular requires professional skills that are currently in short supply in the SSN.

AI IN ADMINISTRATIVE FUNCTIONS

In Italian ASLs, administrative functions in the narrow sense (accounting and budgeting, human resources, purchasing, general affairs, etc.) can be distinguished from management functions introduced with the corporatization process (management control, information systems, operational management, personnel evaluation, etc.). Here we'll try to describe the use of AI by focusing on traditional administrative functions, characterized by approaches and practices that mandate compliance with procedures, in order to assess the potential of AI in terms of process performance and overall pursuit of results.

Healthcare organizations, which are subject to administrative law, enact measures that publicly justify and manifest their actions. The possibility of introducing AI in this field derives precisely from the transparency of the administrative function, which does not face the typical obstacles of confidentiality in its actions.

In order to understand what spaces are open to AI in administrative functions, we propose below pertinent examples of typical activities of public

health authorities that require legal knowledge, technical expertise, transparency and public notification of the actions taken.

Based on these criteria, we identified the following: the adoption of resolutions and decisions, the public procurement of goods/services, and the recruitment of personnel through an open, competitive selection process.

RESOLUTIONS AND DECISIONS

Resolutions and decisions are the means by which the administration formulates its actions. Resolutions are the administrative acts that authorize the general director to carry out the planning, programming, directing, controlling, and general management of the health authority. Decisions are the administrative acts that allow middle managers to carry out specific management activities within the scope of competencies related to their particular office. In a medium/large healthcare organization, more than 3,000 resolutions and decisions are implemented annually.

In order to be valid and legitimate, resolutions and decisions must be drafted according to a logical sequence that legally justifies their adoption based on the relevant factual and legal elements. This is the last step in a process that transversally involves several administrative functions: from the person in charge of the procedure, to the head of the office making the proposal, to the budget manager (if an act involves costs/revenues). Resolutions are made by the directors of administration, health and, if applicable, health & welfare, and are escalated to the general director for approval. Of course, resolutions and decisions are the public manifestation of the organization's will to begin or end a particular process.

The functions most engaged in the adoption of these acts, precisely because they implement open, public procedures, are Purchasing and Personnel; Budget is involved in all initiatives that entail a commitment of expenditure, while General Affairs

usually verifies the formal regularity of the act and the path to its adoption.

The entire process of drafting and adopting resolutions and decisions has been digitized in the majority of public health authorities. As a result, the document flow is managed by ad hoc programs that allow opinions and digital signatures to be added when necessary.

HOW CAN AI SUPPORT THIS ACTIVITY?

AI could be usefully applied to the drafting of the proposed act (resolution or decision), using generative technologies to check the consistency of the formal and substantive elements of the content. By examining and comparing the acts put into effect by the healthcare organization or, even better, by several such organizations (pooling regional or even national data), generative AI could identify the most virtuous patterns, consulting the norms of reference and proposing a resolution/decision text adapted to an evaluation of the interests pursued by the ASL in question. Obviously, the content of the act, with all its essential elements (header, subject, preamble, motivation, body), will depend on the proposed structure. In other words, it may concern the launch of a tender procedure, the publication of a call for candidates, the adoption of the operating budget, etc. Below we try to describe how AI, having helped to initiate these activities, can support their implementation.

PUBLIC PROCUREMENT PROCEDURES

The procurement of goods and services by local health authorities is regulated by the Procurement Law (Decree Law 36/2023). Without going into the details of the regulations and all the evolutions that this area has undergone, including the centralization of purchasing at the national and regional levels, we'll focus on how public tenders are carried out. We'll look at the following stages: identifying needs, preparing tender documents,

evaluating bids and finally awarding the procurement contract.

Identifying needs in terms of types and quantities of goods/services calls for an audit of activities and, hopefully, an assessment of the impact of what has been used over time. This phase requires the analysis of quantitative data on past consumption and the formulation of forecasts, combined with the qualitative evaluations that can be produced by internal experts (suppliers, pharmacists, engineers, clinicians, technicians, etc.), together with input available in the market and in specially created databases.

Once the quantitative and qualitative needs have been defined, the tender documents are drafted by the technical team, including the specifications of the characteristics that the product/service must have and the related evaluation criteria.

The final stage is carried out by the selection committee, which evaluates the bids based on predefined criteria (which may be exclusively economic or qualitative/economic). For example, if the criterion is the most economically advantageous offer, the best price/quality ratio is favored, and a ceiling is set for the economic score. The evaluation in this case includes both quantitative elements, which can be automatically translated into numerical scores, and qualitative elements, which are supported by the review of data sheets and, if necessary, by "real life" tests. Each of the phases described above leverages different multidisciplinary skills, which, of course, must not overlap to guarantee impartiality and process transparency.

It's easy to see that AI can be grafted onto each of these activities, first and foremost by automating the process of making objective assessments and identifying the quantities and characteristics of the goods/services to be purchased. Next, the functions of the technical group could be supported by AI. Specifically, based on the timely definition of the organization's needs, AI would generate the technical specifications in compliance with applicable standards, any safety rules, and

the technical functionalities and requirements of the goods/services to be tendered. Ultimately, AI could establish the optimal price/performance ratio and the evaluation criteria to pinpoint the bid with the characteristics that best meet the needs in question. Finally, the jury awarding the procurement contract would use AI for evaluation, while preserving a monitoring function and the execution of phases dedicated to more complex aspects, such as “real life” testing.

OPEN SELECTION PROCESSES

Employees in public health organizations are usually recruited through open, competitive selection procedures. Apart from the current situation, which has led to the increased use of atypical contracts and service cooperatives for the provision of medical and health services, the vast majority of staff working in the SSN are employed under permanent contracts.

The most common form of public selection process, regulated by Presidential Decree 487 of 1994, is based on qualifications and examinations. The stages of the process can be briefly described as follows:

- Processing of staffing requests (review of staffing needs in relation to business performance).
- Preparation of the call for candidates in accordance with the desired profile and the applicable rules (Presidential Decree 487/94).
- Appointment of the selection committee.
- Preparation of the tests (written, practical, and oral).
- Correcting the written/practical tests and conducting the oral test.
- Determination of the winners by the committee.

Again, as in the case of procurement, the first step is to review the staffing needs based on the activities the ASL performs in line with the organization’s policies. This step calls for an

assessment of the alignment between the actual operational staffing and what is outlined in the Three-Year Staffing Plan (a document that is mandatory for public entities).

Once the needs have been determined, the public notice is prepared, which contains mandatory (normative) and supplementary licensing requirements specific to the organization in question. The notice also contains information on how the tests will be conducted: topics covered, mandatory qualifications for the position, and how they should be presented. The examination committee, usually consisting of three people and a secretary, prepares the written tests and admits candidates who subsequently pass the oral test. At the end of the selection process, a ranking is established based on the scores obtained in the three tests and the qualifications submitted by each candidate.

The stages of an open selection process summarized above can all potentially benefit from AI. From the definition of needs, based on the quantitative analysis of human resources by profile, in relation to the activities to be carried out; to the drafting of the call for candidates in accordance with the required profiles; to the preparation of the tests and the corresponding automatic correction. In this case, the selection board would be able to devote itself exclusively to the oral part of the examination, taking a reasonable amount of time to study the candidates’ skills.

Returning to the process of adopting resolutions and decisions, we can point out that the different phases of open selection processes are the subject of a specific administrative act by which the organization publicly manifests its intention to recruit new staff. In the case of an open call for candidates, for example, there is an initial resolution to publish the notice, a resolution to appoint the selection committee and, finally, a resolution to acknowledge the work of the committee and approve the ranking list. Again, the input of AI seems intuitive: the automatic formulation of the content of the acts as the stages of the competition are carried out.

THE BENEFITS OF AI IN MANAGING TRADITIONAL ADMINISTRATIVE FUNCTIONS

The benefits of using generative artificial intelligence applications to support administrative functions are numerous and substantial.

First, these applications can enhance efficiency by drastically reducing the amount of human labor required to perform activities that are already highly standardized and digitized. AI would also significantly compress overall turnaround times by making the transfer of documents between offices smoother and more secure, minimizing, if not eliminating, material errors.

The automation of document creation processes would then lead to impartiality and process transparency, greatly diminishing the opportunity for improper intervention. Impartiality, transparency, and the elimination of material errors are all elements that would help reduce litigation, with positive implications for cost and business functionality.

Finally, and more generally, the use of AI for these functions would free up resources for activities that are traditionally understaffed, such as monitoring and evaluating business decisions.

It is important to emphasize the dynamic nature of the AI applications described above. Feedback from process owners, as well as amended laws and regulations, would cause automated systems to be updated over time, potentially highlighting critical issues that need to be addressed at an administrative or policy level. What's more, by adopting a broader, enterprise-wide perspective, these applications should lead to greater homogeneity in the form of administrative policies, facilitating the functions of external oversight (e.g., by the Court of Auditors) and governance of the enterprise system at the regional and national levels.

WHAT ARE THE CONDITIONS FOR IMPLEMENTATION?

To achieve such an extensive use of AI in the administrative functions as described above, organizations obviously must develop IT tools with trained systems, and they need usable data. In terms of IT tools, this would require ad hoc investments, the positive effects of which can be understood immediately.

For data, instead, it's a matter of tapping into sources that are normally accessible: resolutions and decisions are published on the public notice board of every health authority; in addition, tenders and competitions can be found in the "Transparent Administration" section, which public bodies are obliged to update constantly.

Completing the digitization of administrative functions is clearly a prerequisite for the adoption of AI solutions.

The situation varies from region to region, and even within the same region, but many ASLs have digitized most administrative processes. More critical is designing the algorithms needed to use data in an "intelligent" way. In this regard, we would like to make two recommendations. The first is to test the different applications in a few ASLs, initially on a few processes, within the framework of experimental projects.

A small number of organizations with advanced digital systems and the motivation to innovate: this is where AI solutions should be developed and tested.

These experiments should then be rigorously evaluated to trigger processes of continuous improvement and possible expansion to other ALSs. The second recommendation concerns the need to activate public-private cooperation.

Health authorities do not have the technical expertise to develop AI applications on their own. Therefore, the involvement of external actors with the necessary know-how, be they start-ups or even more mature companies, is necessary.

CONCLUSIONS

AI applications are becoming more widespread, and healthcare is certainly a promising area. However, clinical applications have noteworthy critical issues that slow down their implementation to some extent. In this paper, our aim was to present some areas of non-clinical AI applications precisely because they seem to present fewer issues of this kind, for example those related to data ownership (a particularly sensitive question in healthcare) or discrimination risks (for algorithms that do not adequately represent ethnicity, gender, etc.).

The public nature of administrative acts, their immateriality, the transparency required by law, as well as the possibility of standardizing a large part of these act measures, make them excellent candidates for smart technology applications. As we have tried to show, these applications would bring very significant benefits to health authorities, which we hope will seize these opportunities.

However, we would like to point out one major sticking point: the lack of adequate staffing. As mentioned above, the administrative staff of healthcare companies tend to be older, and over the past 12 years, strict personnel policies have virtually blocked entry to young people.

This is also true for technical profiles (e.g., engineers). Without bringing in young people who are adequately trained, not so much to design algorithms as to understand their logic and interface with software developers, it will be difficult to carry out successful projects. In this sense, it is critical that companies recruit at the right level and find ways to attract talent in terms of economic compensation, job content, and career advancement.

The economic space is there because most administrative employees will retire in the coming years, freeing up resources for new hires.

MANAGERIAL IMPACT FACTOR

- **Benefits of AI in healthcare:** Applications can bring extraordinary benefits to health administration in terms of efficiency, effectiveness, and compliance.
- **Overcoming barriers to change:** Even though the technology is available, it will require significant change management within organizations.
- **Priority focus areas:** Among various focus areas that lend themselves to AI solutions, good examples include purchasing, personnel, and the general formalization of decision-making activities.
- **Encouraging public-private collaborations:** Rather than waiting for national or regional policies to dictate the introduction of new technologies, healthcare authorities need to take an approach based on decentralized experimentation through public-private cooperation.



REFERENCES

- Bohr, A., Memarzadeh, K. (2020). *Artificial Intelligence in Health Care*. Academic Press.
- Davenport, T., Kalakota, R. (2019). "The potential for artificial intelligence in healthcare." *Future Healthcare Journal*. Jun;6(2):94-98. [doi](#).
- Davenport, T., Glaser, J. P. (2022). "Factors governing the adoption of artificial intelligence in healthcare providers." *Discover Health Systems*. 1(1):4. [doi](#).
- Ferryman, K., Mackintosh, M., Ghassemi, M. (2023). "Considering Biased Data as Informative Artifacts in AI-Assisted Health Care." *N Engl J Med*. Aug 31;389(9):833-838. [doi](#).
- Kissinger, H., Schmidt, E., Huttenlocher, D. (2021). *The Age of AI: And Our Human Future*. Little, Brown and Company.
- Morley, J. et al. (2020). "The ethics of AI in health care: A mapping review." *Social Science & Medicine*. Sep;260:113172. [doi](#).