| Future at Heart

Digital Health & New Models of Healthcare

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P6 Healthcare

After the lessons learned providing support to different healthcare organizations in the management of COVID-19, we at everis are firmly committed to a more human-centered, flexible and resilient digital health model that includes the citizen as a key agent in the management of individual and collective health.

The time has come to shift from a system based primarily on reacting to illness to one that is proactive by default. Public healthcare organizations must adopt a new paradigm where digital health is the lever for the provision of services and, at the same time, helps ensure the sustainability of the universal coverage model, while moving towards 6P healthcare, meaning a healthcare model that is Preventive, Proactive, Participative, Personalized, Precision and Population.

In the current, a one health approach should be taken into account to design and implement programs, policies, legislation and research to better enrich public health outcomes.

The time has come to shift from a system based primarily on reacting to illness to one that is proactive by default.

Integrated Care Models

While the health systems of different countries have different organizational models, the COVID-19 pandemic has revealed that they all have one thing in common: a vulnerability to global infectious diseases that spread very rapidly. To address this and other emerging threats requires healtcare systems to adopt more efficient management practices based on scientific evidence and data, and a holistic approach to public health and preventive medicine.

The current situation highlights the need to strengthen health models geared towards the centrality of the patient and the citizen with a focus on community health. This requires:

1. **Integrating primary and specialized care, and clinical and social care,** so creating hybrid care routes incorporating face-to-face and digital interactions that guarantee a proactive approach to the citizen.

2. **Developing public health management models** geared towards prevention and the strengthening of epidemiological monitoring and surveillance systems with a one health approach.

The new paradigm for the management of health models is shifting towards more preventive and proactive models that anticipate the needs of community health and the management of chronic diseases.

A vulnerability to global infectious diseases that spread very rapidly.

In addition, the challenges in adequately managing the resources needed to guarantee healthcare during the COVID-19 pandemic have revealed the need to build management and equipment structures in a flexible manner that guarantee the availability of resources at key moments.

We at everis believe that digital health can make an important contribution to achieve these goals and overcoming these challenges. By taking advantage of technology, the new health models we propose differ from the current models in the following ways:

- They are integrated models of care, with the focus shifting from acute care to models that strengthen primary care and community health.
- They are patient-centered and seek to achieve the efficient management of care through personalized management, management of community communication and using remote healthcare management and telemonitoring technologies.
- The organizational models are more flexible and resilient, and allow for the adaptation of resources to required needs based on the evolution of citizens' health.
- They include models for health promotion and disease prevention based on individual and community behavior.
- The management models and the decisions taken are supported by evidence and backed by data.

NTT DATA see digital technologies making inroads in these four key areas:

Digital models of engagement that take a patient-centered approach, emphasize community health, and focus on prevention and anticipating needs to guarantee continued care.

Digital Talent and new organizational models to guarantee the adequacy of the needs of health systems with the needs of health professionals throughout the value chain.

Digitalization of management and care processes both from the perspective of developing the latest generation of clinical management systems and automation processes.

Data-driven health to align short and long-term decision-making with the evidence provided in the data.

Our objective with this report is to give everis' perspective on some of the ways that digital technologies are already transforming healthcare and point out areas where digital transformation can help move more quickly towards the goal of an integrated, efficient and more patient-centered healthcare system.

New Engagement Models

Continuous Engagement

One of the fundamental aims of an integrated approach to healthcare is to improve the quality of care at all stages of a citizen's life. So there is a need to deploy a continuous interaction model using digital technologies to better understand the most appropriate care to provide at different life stages of the citizen (maternal-child health, pediatrics, adolescence, aging, etc.), and then to decide on the most appropriate ways to deliver care.

This continuous communication and interaction model should be addressed in a proactive way by an accurate population segmentation linked into a person's lifecycle including social conditioning factors of health.

The engagement models should be oriented to healthcare population behavior monitoring and influence using both an individual and community-based health approach.Additionally, these new engagement models should seek to adapt the priorities of the healthcare system according to the population needs.

This continuous engagement must include an approach based on the patient's experience,taking into account health needs, communication and education needs, psychological support needs and support for the main caregivers.

Benefits

- Proactive communication protocols according to life cycle
- Allow segmentation of communications
- Permit adjustments in planning of services
- Allow collective health monitoring according to population pyramid

New engagement models should seek to adapt the priorities of the healthcare system according to the population needs.

Telemedicine and Remote Monitoring

Telemedicine covers digital interactions throughout the care process (diagnosis, treatment and monitoring). Using telemedicine, providers can systematically care for a variety of pathologies and establish hybrid care itineraries combining face-to-face and remote care, while remote health monitoring system help those with chronic conditions or community health at critical times of epidemic.

Telemedicine and remote monitoring should be addressed aligned to a value based model including a continuous assessment in the main indicators based on health results and patient experience results.

Benefits

- Allow hybrid care circuits to be developed that are hypersegmented by condition, by population group and by individual preferences
- Increase the health system's capacity to respond
- Improve the productivity and satisfaction of professionals and citizens

Telemedicine covers digital interactions throughout the care process (diagnosis, treatment and monitoring).

Proactive and Segmented Communications

Citizens often complain about the difficulties of communicating with healthcare systems. To change that perception, we need to orientate communication according to needs and preferences of the citizen, using omnichannel communication technologies to make the information easily available via different channels.

This personalized and proactive communication strategy permits an individual' shealth behavior as well as their use of healthcare resources to be monitored and influenced.

Benefits

- Adapt communications to the characteristics of each channel
- Permit communication to be tailored to individual needs
- Encourage proactive communication

Citizens often complain about the difficulties of communicating with healthcare systems.

Digital Health Space

One of the most frequent requests from citizens and patients is to have an interoperable personal space co-managed by the patient that provides them with useful health information (diagnostics tests, medication, waiting lists, etc.) and administrative information on appointments and processes.

This digital health space needs to be understood as a dynamic, bidirectional single point of contact through which citizens can have access all their health information.

Benefits

- Establish a single digital space for engagement with the health system
- Self-managed and co-responsibility
- Efficient digital management

Health Education

There is an space to improve the quality and effectiveness of health education, campaigns need to be tailored to individual needs and delivered using the channels most appropriate to a particular population segment or individual, taking into account their lifecycle stage and health condition.

Benefits

- Allow health education resources to be used more effectively
- Guarantee collective co-responsibility of health understood as a public asset

Ther is an space to improve the quality and effectiveness of health education.

Personalized and Precision Care

To facilitate personalizing communication and engagement, health providers need to adopt an omnichannel strategy that helps them monitor interactions of users with the health system, both health-related and administrative, and to segment health advice and warnings. Technologies such as virtual care assistants can help with personalized monitoring.

Precision medicine will be the main challenge for this starting decade by introducing genomic medicine into the healthcare pathways: prevention, diagnosis and treatments.

Benefits

- Tailors the communication strategy so it is aligned with the needs of citizens
- Facilitates personalized communication and engagement

Technologies such as virtual care assistants can help with personalized monitoring.

Decision Support

Digital technologies can help patients make well-informed decisions with digital informed consent and digitalization of living wills, while machine learning algorithms help improve and standardize the decisions that practitioners make.

Benefits

- Improve the quality of decision making
- Eliminate efficiencies and errors due to manual processes
- Failitate individual and personalised treatments

Epidemic and Disease Monitoring

Digital technologies encourage individuals to participate in contact tracing programs and allow a system of consent for epidemiological monitoring to be established that provides specific warnings and advice.

New technologies can facilitate and speed up clinical tirals, especially those associated with vaccines.

Benefits

- Access epidemiological surveillance in real time
- Guarantee co-responsibility in community health, preserving privacy citizens' digital rights

Digital technologies encourage individuals to participate in contact tracing programs.

Digital talent and New Organizational Models

Improving the Employee Experience

In the digital era, health professionals have new needs and expectations as they seek to embrace the challenges posed by an empowered digital society, new health models and the application of new technologies in the workplace.

It is crucial to design hybrid healthcare circuits (face-to-face and digital) aligned with the relevant experience of the professionals to ensure that the demand for high-quality care can be sustained.

Benefits

- Align the needs of the health system with the needs of professionals throughout the value chain

It is crucial to design hybrid healthcare circuits.

Creating a Digital Workplace and Skills

The digitization of healthcare and management processes requires new strategies to transform the workplace of professionals in healthcare organizations. In particular, skills development plans need to be designed and implemented to better face the challenges posed by digital transformation in healthcare organizations (data analytics & AI, blockchain, Internet.

Benefits

- Ensure that health professionals have the necessary skills to face the challenges of the 21st century in the context of digital health
- Orient health systems towards a digital health paradigm that optimizes the use of healthcare resources

Smarter Ways of Working Together

One of the pillars of smarter healthcare is obtaining a complete view of the person and their relationship with the health system, an integrated vision that transcends specific care episodes. That requires developing organizational and knowledge models that encourage team working and cross-discipline collaboration and provide support and traceability of the integration of the different levels of care.

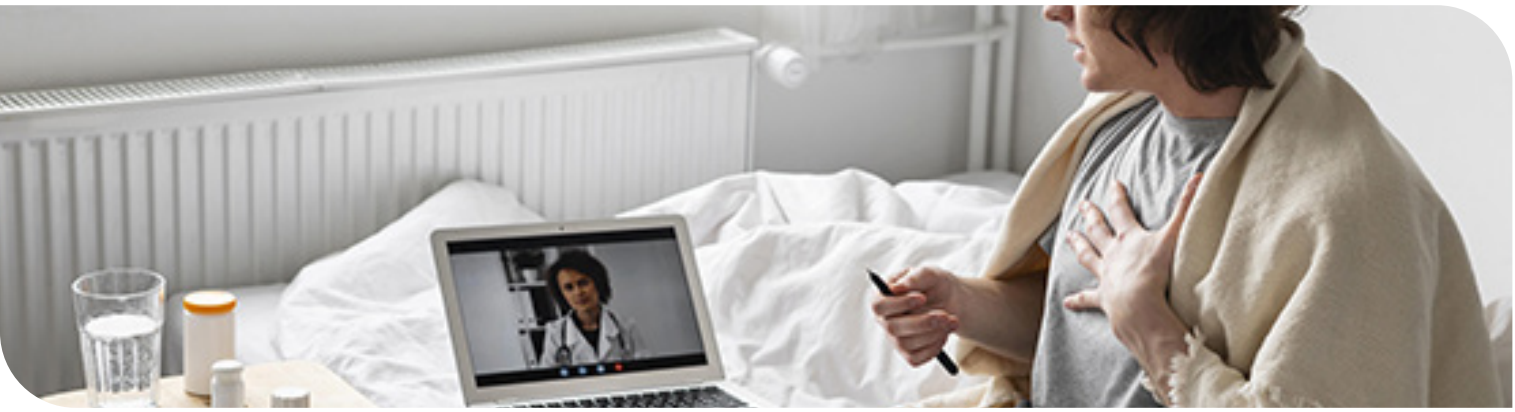
This collaborative work environment not only brings improvements in the health care model but also satisfies a demand from professional groups for more involvement and satisfaction in their work.

Benefits

- Establish an organizational and knowledge model that provides support and traceability to the integration of the different levels of care
- Guarantee a healthcare model oriented to the global view of the person and with an integrated vision of their relationship with the health systemhealth, preserving privacy citizens' digital rights

One of the pillars of smarter healthcare is obtaining a complete view of the person an their relationship with the health system.

Digitization of Management and Clinical Processes



Integration and Interoperability

There is an space health systems need to achieve complete integration of the different levels of care including home care, as well the integration of clinical and social histories to guarantee a healthcare model for older people. Information models need to be digitized to guarantee patient safety.

An effective integration between EHR systems can reduce unnecessary health care episodes, so benefiting citizens and health systems.

Benefits

- Guarantee integration of healthcare information
- Reduce care processes and episodes thanks to integration of information
- Improve patient safety and quality of care

Information models need to be digitized to guarantee patient safety.

Clinical Improvement

One of the most visible ways that digital technology benefits healthcare is at the “frontline”, by incorporating advanced technologies in healthcare processes and integrating them into clinical and information systems (IoT, blockchain, AI, 3d printing, NPL, etc.).

Benefits

- Improve the quality of clinical care and service utilization
- Enable the transition to personalized and precision medicine

Automation of Management Processes

Automation of time-consuming management and administrative processes increases operational efficiency and allows managers and administrators to spend more time on value-added tasks. Optimization of purchasing and logistics is another area where technology plays an essential role, particularly at times of peak demand or in the case of health emergencies.

Benefits

- Reduce costs and improves efficiency
- Digitize labor-intensive activities with no added value

One of the most visible ways that digital technology benefits healthcare is at the "frontline".

Data-driven Health

Integration and Interoperability

Together to develop data-driven delivery models that aid clinical decision-making and monitor health.

With data-driven health, providers can make better-informed decisions when it comes to segmenting populations and planning intervention procedures, for example. They can also design new digital engagement methods and develop community health models that are supported by the evidence contained in the data.

Benefits

- Optimize the use of resources thanks to focus on target population
- Design new digital engagement methods
- Segment interventions and interactions with citizens
- Enable community health models based on evidence

Continuous Engagement

To improve decision-making and move to an evidence-based management model, data analytics and AI technologies can be used to analyze date in different areas: planning, hiring of services, management of resources, management of professionals, etc.

In personalized care, data analytics and AI allows predictive models to be applied in areas such as diagnosis, prevention of complications, models to determine clinical risks (suicide, heart condition, etc.) among others.
AI is already making inroads in acute care, for example, where it detects complex patterns within datasets and provides a level of analysis that transcends that available from conventional protocols.

In epidemiology, standardized epidemiological models can be built that incorporate data from heat maps, social contact patterns and specific population centers, using data generated by the system itself and data captured outside the system, while respecting data privacy.

Benefits

- Activate procedures for communication, preventive intervention and healthcare intervention on a segmented and personalized basis
- Exploit data-based models to receive ex-ante and ex-post evaluations
- Guarantee decision-making based on the evidence of data
- Process and convert information into useful knowledge for critical decision-making
- Exploit live models based on real-time or near real-time data

Together to develop data-driven delivery models that aid clinical decision-making and monitor health.

Automation of Management Processes

One of the most interesting recent trends in data-driven health is the creation of repositories of genomics data for scientific and health research. The data stored can be used in a wide diversity of applications, such as developing algorithms based on genomic data for precision health, developing tailored drugs based on genetic data, or making predictions about an individual's health or about global evolution patterns for conditions.

Images and diagnostic reports are the core of the medical record and key to optimum patient care, and advances in storage, processing and communications technologies make it possible to create medical imaging data repositories accessible to all interested parties. These can be used to develop analytical and AI algorithms for diagnostics support, and to contribute to medical imaging-based clinical research.

The clinical record has traditionally been the principal repository of health information on a patient, and AI is making big inroads in this area. AI-based analytical models help analyze the data in EHR systems to better support clinical practice, while the AI is being incorporated into management models that permit smarter decision-making and the partial automation of treatment episodes.

Benefits

- Enrich the healthcare model with pathological analysis models according to patterns related to detection, prognostic diagnosis and treatment
- Provide healthcare professionals with tools to support decision-making based on advanced technology applied to people's health
- Identify patterns in populations and groups
- Define preventive actions that are supported by data and analytical models
- Improve the quality of scientific and medical research in clinical care through using large volumes of data
- Contribute to boosting research in rare diseases thanks to greater accessibility to data

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Specific application of advanced analytics and AI models (1/2)

Evidence-based management

Establish a model that incorporates data into decision-making in the management of different areas: planning, hiring of services, management of resources, management of professionals, etc

Personalized care

Implement predictive models applied to care such as predictive early diagnosis models, prevention of exacerbation, predictive models to determine clinical risks (suicide, heart condition, etc.) among others.

Epidemiology and collective health

Establish a model that incorporates data into decision-making in the management of different areas: planning, hiring of services, management of resources, management of professionals, etc

Segmentation and hypersegmentation

Implement predictive models applied to care such as predictive early diagnosis models, prevention of exacerbation, predictive models to determine clinical risks (suicide, heart condition, etc.) among others.

Benefits

- Activate procedures for communication, preventive intervention and healthcare intervention on a segmented and personalized basis
- Avail of models based on data to receive ex-ante and ex-post evaluations
- Guarantee decision-making based on the evidence of data
- Avail of information processed and converted into useful knowledge for critical decision-making
- Avail of live models based on real time or close to real time data

Specific application of advanced analytics and AI models (1/2)

Evidence-based management

Create repositories of genomics data for scientific and health research.
Develop algorithms based on genomic data for precision health care.Develop tailored drugs based on genetic data.
Implement individual predictions or global evolution patterns for conditions.

Medical Imaging Data Centers

Create unique medical imaging data repositories.
Develop analytical and AI algorithms that support diagnostics.
Contribute to medical imaging based clinical research.

Treatment of clinical history processing

Generate analytical and AI models to support clinical practice.
Develop latest generation clinical management models that allow for smart support for decision-making and partial automation of care episodes.

Segmentation and hypersegmentation

Create standards for the reporting of information in the face of health crises.
Focus epidemiological information on a territory for decision-making based on comparable data.

Benefits

- Enrich the care model with pathology analysis models according to patterns relating to diagnostic detection and treatment
- Provide health professionals with tools that support decision-making based on cutting-edge technology applied to people's health
- Identify patterns at population and individual level
- Define preventive action based on analytical models with robust data management and processing
- Improve scientific and medical research applicable to clinical care based on large volumes of data
- Contribute to the growth of research on rare diseases thanks to increased data accessibility

Conclusion

The healthcare model in this new paradigm will be focused on guaranteeing a continuum of integrated care based on a holistic health perspective and a biopsychosocial approach. It is geared more towards health promotion and disease prevention, understanding health as an individual and collective asset.

In the future, we will see a healthcare model focused more on primary care that approaches people's health in an integrated manner, breaking the view of health organized into silos of specialization. Diagnostics, prognostics, treatment and monitoring will be valued in a general manner and specialized hospital care will be reserved for highly complex and technical care episodes.

We will have health systems equipped with the latest care and technology models and geared towards personalized precision medicine and treatment.

Medical professionals will focus on higher-value clinical practice while nursing professionals and other primary care specialists will be empowered to provide clinical care within their professional competencies.

The administrative management of health systems and institutions will be carried out automatically, transforming patient or user care systems into personalized care systems and replacing the need for face-to-face contact to perform administrative functions.

But the most essential change is that we will focus health management on a person's individual health behavior with a collective health vision. The focus will be on managing preventive interactions geared towards the promotion of healthy behavior for the individual and society in general.


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