

Handbook of Research on Improving Allied Health Professions Education: Advancing Clinical Training and Interdisciplinary Translational Research

Rui Pedro Pereira Almeida
University of Algarve, Portugal

A volume in the Advances in Medical Education,
Research, and Ethics (AMERE) Book Series



Published in the United States of America by

IGI Global

Medical Information Science Reference (an imprint of IGI Global)

701 E. Chocolate Avenue

Hershey PA, USA 17033

Tel: 717-533-8845

Fax: 717-533-8661

E-mail: cust@igi-global.com

Web site: <http://www.igi-global.com>

Copyright © 2022 by IGI Global. All rights reserved. No part of this publication may be reproduced, stored or distributed in any form or by any means, electronic or mechanical, including photocopying, without written permission from the publisher. Product or company names used in this set are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark.

Library of Congress Cataloging-in-Publication Data

Names: Almeida, Rui, 1987- editor.

Title: Handbook of research on improving allied health professions education : advancing clinical training and interdisciplinary translational research / Rui Almeida, editor.

Description: Hershey, PA : Medical Information Science Reference, [2022] |

Includes bibliographical references and index. | Some chapters in Spanish. | Summary: "This book discusses a range of important topics related to Allied Health Professions Education providing answers to specific problems that arise in the teaching of allied health professions, and transferring knowledge to contribute to translational science through the adoption of best practices in patient care and improving the patient outcomes"-- Provided by publisher.

Identifiers: LCCN 2021054455 (print) | LCCN 2021054456 (ebook) | ISBN 9781799895787 (hardcover) | ISBN 9781799895794 (ebook)

Subjects: MESH: Allied Health Personnel--education | Evidence-Based Practice--education | Translational Medical Research--education | Education, Continuing | Europe

Classification: LCC R697.A4 (print) | LCC R697.A4 (ebook) | NLM W 18 | DDC 610.73/7069071--dc23/eng/20220106

LC record available at <https://lcn.loc.gov/2021054455>

LC ebook record available at <https://lcn.loc.gov/2021054456>

This book is published in the IGI Global book series Advances in Medical Education, Research, and Ethics (AMERE) (ISSN: 2475-6601; eISSN: 2475-661X)

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: eresources@igi-global.com.

Table of Contents

Foreword XX

Preface xxii

Section 1

Allied Health Profession Education: Skills, Competences, and Challenges

Chapter 1

Allied Health Professions: Competences and Challenges of Interprofessional Education 1

Ana Catarina Pereira, Polytechnic Institute of Castelo Branco, Portugal

Isabel Neto, University of Beira Interior, Portugal

Chapter 2

Healthcare Professionals: What Skills Should Be Developed to Face the Change? 17

Felismina R. P. Mendes, Comprehensive Health Research Centre, Universidade de Évora, Portugal

Laurência P. Gemito, Comprehensive Health Research Centre, Universidade de Évora, Portugal

Chapter 3

Training Future Health Professionals in Communication Skills 35

Susana Rodrigues, University of Algarve, Portugal

Ana Catarina Baptista, University of Algarve, Portugal

Tânia Nascimento, University of Algarve, Portugal

Vera Galinha, University of Algarve, Portugal

Chapter 4

The Multiplicities of an Ethics Committee in Higher Education 51

Diana Tavares, Escola Superior de Saúde, Politécnico do Porto, Portugal

Agostinho Cruz, Escola Superior de Saúde, Politécnico do Porto, Portugal

Ana Paula Cabral, Entidade Reguladora da Saúde, Portugal

Alberto Machado, Câmara Municipal do Porto, Portugal

Helena Sousa, Escola Superior de Saúde, Politécnico do Porto, Portugal

Henrique Curado, Escola Superior de Saúde, Politécnico do Porto, Portugal

Isabel Faria, Escola Superior de Saúde, Politécnico do Porto, Portugal

Manuela Amorim, Escola Superior de Saúde, Politécnico do Porto, Portugal

Maria João Gonçalves, Escola Superior de Saúde, Politécnico do Porto, Portugal

Paula Maria da Costa Lopes, Escola Superior de Saúde, Politécnico do Porto, Portugal

Pedro R. Monteiro, Escola Superior de Saúde, Politécnico do Porto, Portugal

Chapter 5

- Working Conditions of Healthcare Professionals and Their Implication in COVID-19 Times:
Notes for a Systematic Review 66
Carlos Alberto Silva, School of Health and Human Development, University of Évora, Portugal
Francisca Carvalheira, University of Evora, Portugal
Victor Manuel Borges Ramos, University of Evora, Portugal
Maria Laurência Gemito, University of Evora, Portugal

Chapter 6

- The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health
System: Limitations, Challenges, and Lessons Learned..... 91
Carmen Rodríguez-Reinado, University of Huelva, Spain
Alfonso Chaves-Montero, University of Huelva, Spain

Section 2

Education and Translational Research in the Medical Imaging and Radiotherapy Fields

Chapter 7

- Training, Skills, Professions, and Labor Market in Medical Imaging and Radiotherapy: The
Counter Cycle of Specialization and the Setback of the Social Recognition 108
António Abrantes, University of Algarve, Portugal

Chapter 8

- Improving the Entry-to-Practice Education of Radiographers 124
Terry Ell, International Society of Radiographers and Radiological Technologists, Canada

Chapter 9

- Improving Allied Health Professions Education With Clinical Training and Interdisciplinary
Translational Research: Radiotherapy Vision..... 138
Magda Ramos, University of Algarve, Portugal

Chapter 10

- Patient Safety: The Importance for Radiography Education and Training 153
Kevin Barros Azevedo, University of Algarve, Portugal

Chapter 11

- Quality of Life and Quality of Work Life Among Radiographers: A Comparative Study Between
Portugal and England..... 169
Bianca Vicente, Health School, University of Algarve, Portugal
Inês Pinto, Hospital Lusíadas, Albufeira, Portugal

Chapter 12

- Challenges in Ultrasonography Education and Training: Building Bridges for the Professional
Practice of Radiographer in Portugal..... 186
Manuel José Cruz Duarte Lobo, Local Health Unit of the Northeast, Portugal
*Sérgio Carlos Castanheira Nunes Miravent Tavares, Basic Emergency Service of Vila Real
de Santo António, Portugal*

Section 3

Active Learning Methodologies and Emerging Challenges: What Should We Learn From the Evidence?

Chapter 13

New Challenges in Medical Imaging and Radiotherapy Education 205

Lara F. N. D. Carramate, University of Aveiro, Portugal

Serafim Pinto, University of Aveiro, Portugal

Rui Pereira, University of Aveiro, Portugal

Silvia De Francesco, University of Aveiro, Portugal

Paula Martins, University of Aveiro, Portugal

Milton Santos, University of Aveiro, Portugal

Chapter 14

Current and Future Challenges in Physiotherapy Education 229

Ana Tomé, Centro Hospitalar Universitário do Algarve, Portugal

Catarina Duarte Santos, Faculty of Medicine, University of Lisbon, Portugal

Margarida Sequeira, School of Health, Polytechnic Institute of Setubal, Portugal

Chapter 15

Reflective Practices in Speech and Language Therapy Degree 252

Maria João Gonçalves, Health School, Polytechnic Institute of Porto, Portugal

Brígida F. Patrício, Health School, Polytechnic Institute of Porto, Portugal

André G. M. Araújo, Health School, Polytechnic Institute of Porto, Portugal

Paula Cristina Faria, Health School, Polytechnic Institute of Porto, Portugal

Marta Joana Pinto, Health School, Polytechnic Institute of Porto, Portugal

Chapter 16

Education in Prosthetics and Orthotics: The Core of Active Teaching Methodologies 273

Adriana Isabel Rodrigues González Cavaco, University of Algarve, Portugal

João Miguel Quintino Guerreiro, University of Algarve, Portugal

Chapter 17

Evidence-Based Practice in Osteopathy: Contribution to Develop Better Professionals 289

Andre Frias, Escola Superior de Saúde da Cruz Vermelha Portuguesa, Portugal

Ana Cristina Ferreira da Costa, Escola Superior de Saúde da Cruz Vermelha Portuguesa, Portugal

Section 4

And What About the Future of Translational Research? Contributions of Doctoral Education and Continuous Improvement Strategies in Health Organizations

Chapter 18

Interdisciplinary Professional Doctoral Education: Translational Research for Allied Health Professionals 312

Catherine Hayes, University of Sunderland, UK


Ian Corrie, University of Cumbria, UK

Chapter 19	
How to Educate Health Organizations to Apply Lean Methodology	333
<i>Dulce Lourenço Miranda, Hospital Fernando Fonseca, Portugal</i>	
<i>Carlos Alberto Silva, University of Évora, Portugal</i>	
Compilation of References	345
About the Contributors	399
Index	407

Chapter 6

The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health System: Limitations, Challenges, and Lessons Learned

Carmen Rodríguez-Reinado

 <https://orcid.org/0000-0002-5345-6656>

University of Huelva, Spain

Alfonso Chaves-Montero

 <https://orcid.org/0000-0001-5861-3414>

University of Huelva, Spain

ABSTRACT

The COVID-19 pandemic has generated the greatest health crisis experienced in the 21st century, straining the capacity of health systems and posing an unparalleled challenge: how to make the health system efficient through the implementation and use of new information and communication technologies. The general objective of this chapter is to present the case of the Andalusian public health system and the use of information and communication technologies during the first stages of the pandemic with the aim of outlining some reflections and proposals for improvement in order to advance along the path of modernisation and digitalisation of the Andalusian public health system.

DOI: 10.4018/978-1-7998-9578-7.ch006

INTRODUCTION

The COVID-19¹ pandemic has had an unprecedentedly large global impact on the entire social system with serious repercussions for the global economy and global health. We have witnessed a global economic setback and the largest health crisis situation in the 21st century as a result of the rapid spread of the SARS-CoV-2 virus (Xio et al., 2019). Employment, education, social life, health, communication and other aspects have been profoundly affected, albeit unevenly across countries and population groups. For example, the most fragile health systems have suffered the most, finding it more difficult to provide healthcare and clinically treat COVID sufferers. The most socially vulnerable population groups have had a higher incidence rate, exacerbating their poverty. In general terms, existing social inequalities have been accentuated at global, national and regional levels. Hence, the recent article published in the prestigious journal *The Lancet*: “COVID-19 is not a pandemic” (Horton, 2020), has rescued from the annals of science the term “syndemic” (Singer, 2008) - coined by the American medical anthropologist Merrill Singer in the late 1990s - to put on the table of scientific debate that, if the COVID-19 pandemic is only approached exclusively from a biomedical model, the policies developed to combat it will not be effective.

In this global epidemiological context, the COVID-19 epidemic has put our health systems in check, posing a unique challenge for governmental and administrative institutions as well as for professionals, citizens, hospitals and primary care health centres; and in general for society as a whole: in the context of a pandemic, How to make the health system efficient through the use and implementation of new Information and Communication Technologies (ICT)? We define ICT “as the set of technologies that make it possible to acquire, store, process, communicate, record and present information in the form of images, voice and data, including electronics as the basic technology to support the development of telecommunications, information technology and audiovisuals” (Fernández, Gordo & Laso, 2016, p. 2).

The general objective of this chapter is to present the case of the Andalusian public health system and the use of ICT during the early stages of the COVID-19 global syndemic. To this end, it first introduces, from a macro perspective, the changes produced, roughly speaking, by the COVID-19 epidemic in the social structure at a global level, as well as its effect on the health system and the use made of ICT as a tool for health care and continuity of care at the beginning of the pandemic. Secondly, it analyses the effects of the pandemic on the Andalusian healthcare system and its relationship with the system’s digitalisation process, as well as the use of ICTs by both healthcare professionals and the general public. Finally, in the spirit of further progress in the modernisation and digitisation of the Andalusian healthcare system, a series of recommendations are outlined.

THE EFFECT OF COVID-19 SYNDEMIA ON THE HEALTH SYSTEM

On 30 January 2020, after the different members of the World Health Organisation’s (hereafter WHO) Emergency Committee reached agreement on the severity of the SARS-CoV-2 virus, the Director-General informed the international community that the disease constituted a Public Health Emergency of International Concern (hereafter PHEIC) with a high risk to global health (WHO, 2020). A few days later, the WHO determines - concerned about the alarming levels of spread of the virus and the severity of the disease, as well as the levels of government inaction on the situation - that the SARS-CoV-2 virus

can be characterised as a pandemic. Months later, in March 2021, the virus had reached almost every corner and country in the world; and Europe began to experience the so-called “first pandemic wave”²:

During the first wave of the pandemic, with the scientific evidence available at the time on the spread of the virus, certain public health strategies were adopted to prevent the transmission and spread of the virus. Some of these measures that were adopted have been modified, or discarded, with the scientific evidence that was subsequently generated. However, others have been key to the control of the pandemic throughout the first wave, and throughout the subsequent period up to vaccination. In addition, some of these measures, which have proved effective in controlling the pandemic, have also had a major influence on the use of ICT by health systems, professionals and the public. The following are three of the main measures that, given their characteristics, have had a great social repercussion and impact on the use of technologies: quarantine, confinement and social distancing COVID-19: Quarantine, isolation, social distancing and confinement, Are they the same? (Sánchez-Villena & De La Fuente-Figuerola, 2020).

The first measure refers to the concept of “quarantine”, a concept that should not be confused with the health measure of isolation. Basically, quarantine consists of the restriction, voluntary or compulsory, of the movement and mobility of persons who may have been exposed to a potential contagion of the virus, and who may very probably be infected, but do not show symptoms. Therefore, if infection is suspected, the person must remain in a specific place. The aim is to observe whether the person develops the disease during the incubation period, minimising the spread of the virus. However, if the person is finally found to be infected, isolation is then carried out. Isolation basically consists of the physical separation of the person from the environment. During this period, medical care, psychological support, shelter and food must be provided to the person. Scientific evidence shows that this measure is very effective when the disease has been detected early, and therefore the infected person is isolated in time, preventing the spread of the virus through social contact with other people.

The second measure concerns “containment”, which can be broadly defined as an intervention measure at the community level. It is therefore a measure that can be applied to a whole population or to specific social groups. It is generally implemented when the incidence of the virus has reached levels of “community transmission”, with an R value greater than 3. It basically consists of reducing social interactions by employing a variety of measures such as restriction of mobility, restriction of movement schedules, cessation of economic activities, suspension of transport, social distancing, mandatory use of masks, border closures, etc.

And regarding the last measure, “social distancing”, which basically consists of people maintaining a minimum physical distance in social interactions, or avoiding direct social contact, as well as staying away from crowded spaces and places. This measure is implemented when there are infected persons who, having not been identified and isolated, may continue to transmit the disease. The aim of this measure is to control the spread of the disease by preventing sick people from coming into contact with healthy people. In this sense, social distancing may involve closing public places where there is a higher concentration of people such as schools, or shopping centres, bars, theatres, or cancelling social and public events (football matches, concerts), or closing offices, or restricting the number of people at group gatherings, and closing mass transit systems or further restrictions on air, rail and sea transport. Also included are cordons sanitaires, which is the restriction of entry to or exit from a locality, commune or region.

In the case of Spain, all these public health measures were implemented nationwide when the State of Alarm was decreed for the first time on 14 March 2020 due to the COVID-19³ health crisis. The implementation of these measures, together with the mobility restrictions resulting from the State of Alarm,

and the collapse of the healthcare system due to the large volume of patients infected by COVID-19⁴, as well as the population's fear of becoming infected in healthcare facilities, generated unprecedented changes, in the short and long term, in the organisation of the public healthcare system.

Information and Communication Technologies and Telemedicine

Faced with this new global scenario of emergency and world crisis, during this first phase of the syndemic, health systems organised their medical care to provide healthcare by adopting digital solutions and advanced technological tools. Much of the healthcare was carried out remotely and with telemedicine, using different technological strategies - phone, messaging, WhatsApp, etc. - at all levels of care. Attendance at face-to-face consultations was drastically reduced in healthcare. Many surgeries and follow-up consultations were also postponed. This was also the case for emergency care consultations (Mauro, 2020). Many studies have already estimated all missed consultations and delays of diagnostic tests of patients during the first wave of the pandemic. For example, in breast cancer, it is estimated that a total of 5,590 to 8,125 diagnoses have been missed, with a probability of progression from stage I to stage II and III in 50% of cases in Italy during the first wave (Vanni et al., 2020).

There is no doubt that this situation of global crisis and emergency has strained health systems, putting their technological and response capacity to the test. But on the other hand, it has also favoured and accelerated the digital transition widening the digital divide (Song, Qian & Pickard, 2021). According to experts in the field, the implementation of ICT use during this first year of the pandemic advanced what would have taken at least five years in a normal situation. In this regard, a systematic review of how health systems responded to the emergency and health crisis in the early stages of the epidemic shows that digital solutions to address emerging needs increased exponentially (Golinelli et al., 2020). Digital platforms, Zoom, Meet, Skype or WhatsApp applications, simulation, video visits, emails, digital programmes, webinars or videoconferences became indispensable tools for health professionals and citizens.

Therefore, telemedicine and ICT became a key link in the continuity of care in health systems. In this sense, WHO (2010) has defined telemedicine as “providing health services, where distance is a critical factor, by any health professional, using new communication technologies for the valid exchange of information in the diagnosis, treatment and prevention of disease or injury, research and evaluation, and continuing education of health providers, all in the interest of improving the health of individuals and their communities” (WHO, 2010). In the field of diagnostics, and specifically in COVID diagnosis, diagnostic tools powered by artificial intelligence (AI), or voice interface systems and mobile sensors such as watches, oxygen monitors or thermometers were successfully employed (Golinelli et al., 2020). Also, remote consultations have proven effective in accessing health services for patients who did not have the virus, as well as for patients with non-acute COVID-19 (Keesara, Jonas & Schulman, 2020).

Despite these advances and successes, there are still many challenges and opportunities that our healthcare systems have yet to resolve with regard to technological and digital modernisation. And among the unresolved issues, we must not forget an essential aspect to guarantee social justice: How to manage a process of technological modernisation while guaranteeing universal coverage and equitable access for all citizens? In order to achieve this goal, it will be essential, and at the very least necessary, to address the existing inequalities in access to and use of new technologies, which has been called the digital divide (Olarde, 2017).

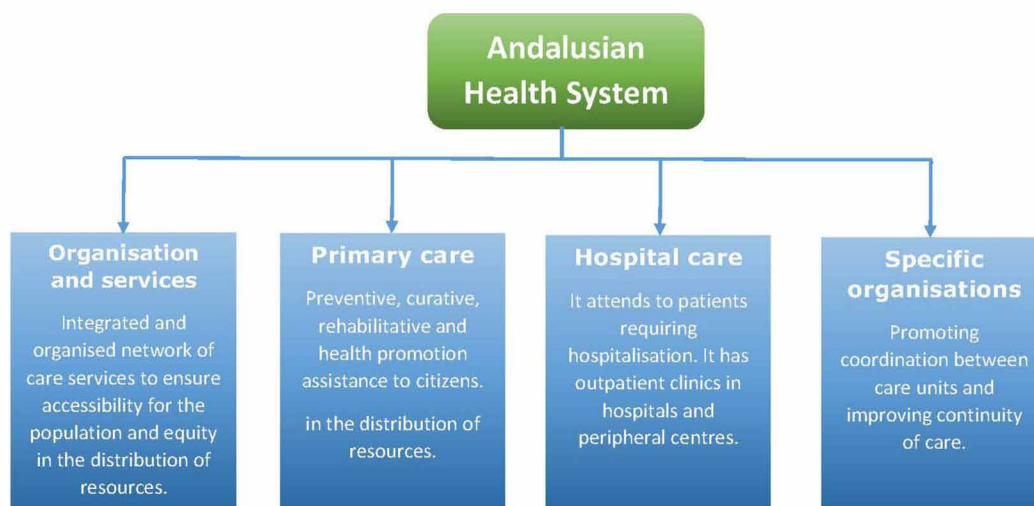
ANDALUSIAN HEALTH SYSTEM AND HEALTH CRISIS COVID-19

Andalusia is one of the 17 autonomous communities that make up the political-administrative map of the whole of Spain. In Spain, competences in the field of health are transferred to the autonomous communities. This means that in the case of Andalusia it is the administration of the Junta de Andalucía and its bodies that make decisions in the field of health. This autonomous administration is organised by “consejerías”, with the Consejería de Salud y Familias being responsible for leading public health, health policy, planning, regulation, management and provision of health services in Andalusia.

The Andalusian Health System (hereinafter SAS) was created as a result of the decentralisation of health administration carried out by the General Health Act (1986), and its subsequent modifications through decree laws. The SAS is regulated by the Andalusian Health Act (1998). This law establishes the guiding principles that the SAS must bear in mind both in its organisation and in its performance in the provision of health services. These principles are: 1. Universalisation and equity in the levels of health and effective equality in the conditions of access to the Andalusian Public Health System. 2. Achievement of social equality and territorial balance in the provision of health services. 3. Integral conception of health, including promotion, health education, prevention, care and rehabilitation. 4. Functional integration of all public health resources. 5. Planning, efficacy and efficiency of the health organisation. 6. Decentralisation, autonomy and accountability in the management of services. 7. Citizen participation. 8. Participation of health system workers. 9. Promotion of individual and social interest in health and in the health system. 10. Promotion of teaching and research in health sciences. Continuous improvement in the quality of services, with a special focus on personal care and the comfort of patients and their families. 11. Effective and efficient use of healthcare resources.

Figure 1. Organization of the Andalusian Health System

Source: Own elaboration based on information obtained from Regional Ministry of Health and Families of the Andalusian Regional Government (2021).



The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health System

These guiding principles have guided the organisation, planning and provision of health services in Andalusia with the aim of achieving a strong health system; egalitarian and comprehensive in access; equitable and participatory, giving a voice to both health professionals and citizens in the demand for their needs. The SAS is currently structured into various levels of care in the provision of health services. Figure 1 below shows the organisation of health services:

To date, it is estimated that approximately 60,000 health professionals, 408 public health centres, 1,111 medical offices, 2,400 private health centres, 29 hospitals, 3 university cities dedicated to health research, 171 mobile units, 368 critical care and primary care emergency units, 30 mobile ICUs, 5 advanced coordination teams for emergencies, make up the bulk of the health services provided by the SAS (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021).

Thus, these were the resources and health organisation available to deal with the health emergency arising from the first wave during the COVID-10 pandemic on the part of the Regional Ministry of Health, under the guidelines of the central government. It should be remembered that during the state of alarm decreed in Spain due to the COVID-19 pandemic, it was the central government, with a single command, which led and managed the health emergency and crisis situation. Therefore, it will be the central government that will manage all resources and the provision of health services in Andalusia during the state of emergency. Private facilities were also managed by the central government, making use of the private health network during the first wave of the pandemic.

In Andalusia, compared to other Spanish regions such as Madrid or Catalonia, the first wave of the COVID-19 pandemic was felt a little later. In the first wave Madrid had an incidence of 61,171, Catalonia 48,916 and Andalusia 12,048 infected with COVID-19. However, weeks later, the Andalusian health system, like the rest of the health systems, will be strained and collapsed by the heavy pressure on care due to the high cumulative incidence of COVID-19 patients. As of 31 March 2020, a total of 235 COVID-19 patients were hospitalised in ICU in Andalusian health services.

Thus, the Andalusian government, under the guidelines of the central government, in order to deal with the COVID-19 pandemic during this first wave, implemented the action plan and adopted the relevant public health measures in Andalusia. The adoption of this action plan and measures had, like the national health system as a whole, repercussions on the dynamics and healthcare organisation of the SAS, with a major impact on the use of ICT by both healthcare professionals and the public. However, despite all the efforts made, the total number of people who died from the COVID-19 disease in Andalusia was 11,286 during the entire pandemic as of 31 October 2021 (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021). As shown in figure 2, the largest number of deaths occurred in the 85-89 age range. There is no doubt that the elderly have been the most vulnerable population group and the most affected during the pandemic:

To date, it is estimated that approximately 60,000 health professionals, 408 public health centres, 1,111 medical offices, 2,400 private health centres, 29 hospitals, 3 university cities dedicated to health research, 171 mobile units, 368 critical care and primary care emergency units, 30 mobile ICUs, 5 advanced coordination teams for emergencies, make up the bulk of the health services provided by the SAS (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021).

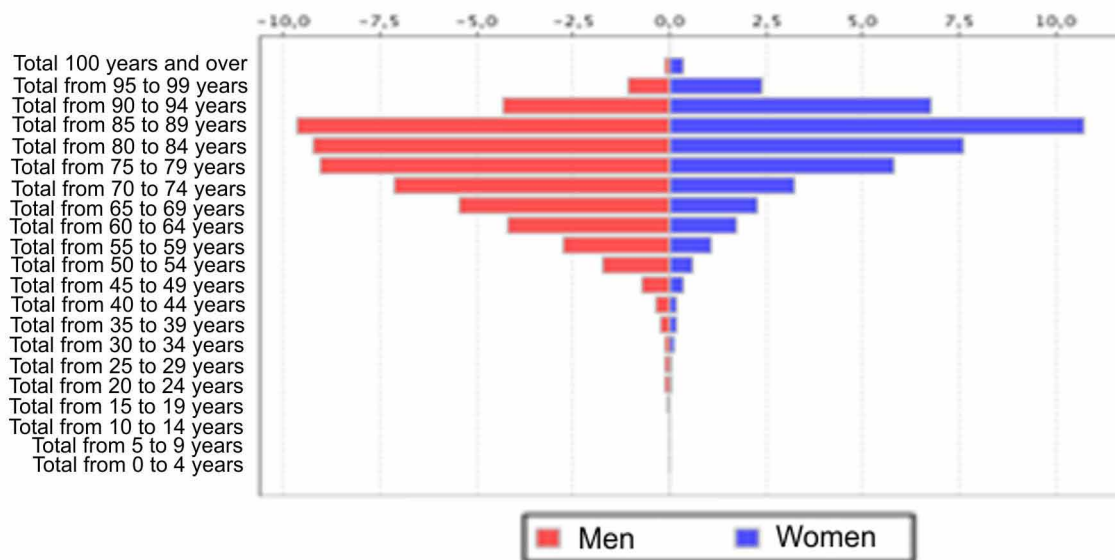
Thus, these were the resources and health organisation available to deal with the health emergency arising from the first wave during the COVID-10 pandemic on the part of the Regional Ministry of Health, under the guidelines of the central government. It should be remembered that during the state of alarm decreed in Spain due to the COVID-19 pandemic, it was the central government, with a single command, which led and managed the health emergency and crisis situation. Therefore, it will be the

The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health System

central government that will manage all resources and the provision of health services in Andalusia during the state of emergency. Private facilities were also managed by the central government, making use of the private health network during the first wave of the pandemic.

Figure 2. Deaths by age

Source: Health Statistics Service, Regional Ministry of Health and Families of the Andalusian Regional Government (2021).



In Andalusia, compared to other Spanish regions such as Madrid or Catalonia, the first wave of the COVID-19 pandemic was felt a little later. In the first wave Madrid had an incidence of 61,171, Catalonia 48,916 and Andalusia 12,048 infected with COVID-19. However, weeks later, the Andalusian health system, like the rest of the health systems, will be strained and collapsed by the heavy pressure on care due to the high cumulative incidence of COVID-19 patients. As of 31 March 2020, a total of 235 COVID-19 patients were hospitalised in ICU in the Andalusian health services.

Thus, the Andalusian government, under the directives of the central government, in order to tackle the COVID-19 pandemic during this first wave, implemented the action plan and adopted the relevant public health measures in Andalusia. The adoption of this action plan and measures had, like the national health system as a whole, repercussions on the dynamics and healthcare organisation of the SAS, with a major impact on the use of ICT by both healthcare professionals and the public. However, despite all the efforts made, the total number of people who died from the COVID-19 disease in Andalusia was 11,286 during the entire pandemic as of 31 October 2021 (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021). As shown in graph ⁵ 3, the largest number of deaths occurred in the 85-89 age range. There is no doubt that the elderly have been the most vulnerable population group and the most affected during the pandemic:

On the other hand, the consequences for the health of chronically ill patients of the interruption in the follow-up of their illness during the pandemic should not be overlooked.

The Digital Environment and Information and Communication Technologies in the Andalusian Health System

Prior to the union, Andalusia had begun the process of digitisation and modernisation of the public health system. It is worth mentioning that it was one of the pioneering autonomous communities in Spain in the digitisation process of its healthcare system. The aim of this digitisation process and the implementation and development of ICT in the SAS is to improve the quality of healthcare and the accessibility of medical information to the public, both for users and for healthcare professionals. In general terms, the aim is to use telematic tools to make healthcare processes faster and more efficient, with the ultimate aim of having a positive impact on the health and well-being of Andalusian society.

The digitalisation process developed by the SAS is largely determined by the concept of “Health 2.0”. This concept is defined as a new integral conception of medical and health care that focuses on the general public (Fernández, Juárez & Monte, 2012). Thus, patients, professionals, administrators and providers actively participate using social networks and web 2.0 tools with the aim of improving the quality of life, care and health of people in the autonomous community. This concept has now evolved into the concept of Health 3.0 and Health 4.0, as social networks are a form of interaction, easily accessible and free of charge. In Health 3.0, the patient is placed in a proactive role with regard to his or her healthcare. This is an empowered patient, who is informed about his or her illness, actively seeks information on the web and increasingly demands more from the healthcare system. On the other hand, thanks to Big Data, healthcare professionals will relocate to a new network or collaborative universe under technological security keys. With regard to the concept of Health 4.0, it encompasses everything related to the digital transformation that the healthcare sector is undergoing, a transformation that puts the patient at the centre of the system. This concept is going to transform the way we understand health, the products and services that healthcare systems develop, now more focused on solving the needs of the patient and the new capabilities that will be necessary as technology is combined with health (Arroyo & Díaz 2021).

Thus, in this line of modernisation of the public health system, Andalusia has carried out many initiatives to promote the incorporation of ICT in the SAS. Such is the case of the DIRAYA project, which began in 2006. This project was initially based on the implementation of a health card containing all the clinical data of more than seven million Andalusians, 66% of the population. After achieving this great challenge, progress has been made in the mission of computerising patients’ medical records. Thus, the objective has been to achieve a digital medical record for each SAS patient, in addition to being able to establish electronic prescriptions, a new service that facilitated healthcare for the Andalusian population.

Another of the projects developed with great success, and which proved to be very functional during the COVID-19 pandemic, and for arranging vaccine appointments, was the Salud Responde mobile application of the Andalusian Regional Ministry of Health and Families. In terms of the services offered, the following can be highlighted (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021):

- Appointment with the family doctor and paediatrician.
- Appointment with the reference nurse.
- Salud Andalucía 24 hours (health advice).
- Management of health campaigns by SMS messages to mobile phones.
- Information on any subject related to the Andalusian Public Health System.

The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health System

- Open window to the family. Information and periodic reminders that will help in the upbringing of sons and daughters, from birth to 14 years of age.
- Access to the Andalusian Registry of Advanced Living Wills.
- Follow-up of patients assisted by 061 and who remain at home.
- Information on the Health Card.
- Information on the vaccination campaign against influenza and chickenpox.
- Information on Influenza.
- Heart/air programme.

Another line of action and digital transformation of the SAS has been the integration of mobile health services to approach the prevention and monitoring of patients with chronic diseases such as heart failure, asthma, diabetes, etc. (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021).

Likewise, recently the application of emerging technologies such as Big Data, Analytics, Machine Learning or the Internet of Things is completing the integration of the information systems of Andalusia's healthcare centres (ONTSI, 2020).

There is no doubt that, before the pandemic, the Andalusian government was committed to telemedicine. However, the outbreak of the COVID-19 pandemic has reaffirmed and reminded us of the need to continue advancing along this line of modernisation and transformation of the healthcare system. Hence, video-calling between healthcare professionals and patients is currently being implemented to attend to certain cases and diseases such as chronic diseases and vulnerable patients, both in primary care and in speciality services (Fernández, Gordo & Laso, 2016).

It is now a reality, a lesson learned during the COVID-19 pandemic, that it is possible to remotely monitor patients and implement telephone consultation. Telemedicine for patients with type 1 diabetes is also a fact. Currently, more than 5,000 people suffering from type 1 diabetes are attended through technological tools based on flash systems for monitoring glucose levels and adapting their treatments, thus carrying out individualised telematic monitoring of patients (Regional Ministry of Health and Families of the Andalusian Regional Government, 2021). This measure has minimised the risk of COVID infection in these patients, as it prevents them from travelling to hospitals where there is a higher risk of infection.

Unintended Consequences of Information and Communication Technologies: The Digital Divide in the Health System

The implementation of ICT in the healthcare system generates many benefits for healthcare and population health. Not only does it allow for a more sustainable, effective and efficient healthcare system, but it can also reduce existing social inequalities in health. However, the scientific literature has shown that, beyond all its benefits and promises, the use of and access to ICTs is ambivalent and can become an element of social exclusion, producing or increasing social inequalities. This unintended effect of ICTs has been referred to as the existence of the digital divide. In general terms, the concept of the "digital divide" has been used to refer to the separation that occurs between different social groups (by country and within each state) in the access and use of ICTs as part of their daily routine (Olarte, 2017). In this regard, an important aspect to take into account is to distinguish between access to and use or exploitation of these technological tools (Pérez-Escoda, Lena-Acebo & García-Ruiz, 2021). Thus, the digital divide in terms of access refers to the possibilities that people have to access these resources, with the

socio-economic level of the individual being a determining factor. And the digital divide in terms of ICT use refers to the lack of digital skills that prevents people from using the technology, with the level of education and age of the people being a determining factor.

Traditionally, the existence of the “digital divide” has been manifested in the inequalities produced in the access and use of ICT between men and women. Hence the use of the concept of the “gender digital divide” to define the distance that exists between men and women with respect to access to and use of ICT with respect to the use of technologies (Olarte, 2017). It is worth mentioning that, although these differences in ICT access and use according to gender still persist, data recently published by the Observatory for Equality and Employment in Spain indicate a decrease in this gap (Sáinz, Arroyo & Castaño, 2020). This trend coincides with the data published in the ONTSI report (2020), which indicates that in the last six years there has been a reduction in the gender gap in the digital sphere in Europe (ONTSI, 2020).

Among the various problems that COVID-19’s syndemic has exacerbated is the existing digital divide. In this respect, data from the INE’s Survey on Equipment and Use of Information and Communication Technologies in Households (2020) shows that there are inequalities in access to and use of ICTs depending on age, place of residence, level of education, relationship with the activity being carried out, nationality and income level. With regard to ICT use, the same survey reveals that there are also differences in the use of ICTs between men and women and, specifically, in health-related issues. Women are more likely than men to access digital information on health issues (73% compared to 61%) or to make a doctor’s appointment online (43.6% compared to 36.9%). The data for Andalusia, according to the Report on digital transition in Andalusia: realities and challenges (2020), show that 49% of internet users in Andalusia are aged between 16 and 74, and have searched on Google for information on medicines or illnesses that they, their family or friends suffer from. In this sense, the data from the report indicates that 73% of internet users would like their doctor to recommend websites related to their health problem. The data also reveal that 84% of the Andalusian population is aware of the existence of technological devices to measure aspects related to their health and that 69.3% use these technologies of their own free will. Finally, it points out that 51.9% of the population say that ICT and their use avoid visits to the health centre that are sometimes unnecessary. It also specifies that 75% of SAS users in Andalusia want to receive information about their health on their technological devices.

On the other hand, syndemia has also accentuated the digital divide in access to ICT, and specifically in access to health care in the health system. A report published by the Ministry of Health (2020) has shown how during the first wave of the pandemic certain socially disadvantaged social groups, such as the migrant population, had more digital barriers to access the health system (Ministry of Health, 2020).

Strengths, Weaknesses and Proposals for Improvement with Regard to Information and Communication Technologies in the Health System

The health crisis caused by the COVID-19 pandemic has highlighted the functionality of ICT in many areas of society (education, care, work, culture, economics, health, etc.). The role played by ICT during the first wave of the pandemic, in confinement, has been essential in the economic and social continuity of societies. The face-to-face was replaced by the digital through ICT, which energised and enabled a large majority of the population to continue to work effectively, or to continue their learning process at school, or to interact with other people, or to purchase goods and services, or to access health care, etc.

The current pandemic is causing a major transformation in the Andalusian healthcare system, most markedly in the primary care network. Much of this change is determined by the incorporation of ICT

The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health System

in healthcare. This change affects both the organisation of healthcare and the professional practice of healthcare professionals and citizens. The SAS has had to adapt to the new circumstances by carrying out tele-diagnosis, tele-care and video-consultations, which currently represent a great opportunity for improvement and efficiency in the quality of healthcare. But this current situation of health crisis has also put to the test the degree of modernisation and digitalisation, as well as the availability of the technological resources of the SAS (Arroyo & Díaz 2021). In general terms, the SAS faces the major underlying difficulty of a lack of funding to be able to carry out a digital transformation and modernisation of the Andalusian healthcare system (Carbajo, 2020).

Below we outline a set of lines of action which, according to certain authors, are indicators of an adequate implementation and degree of development of ICT in the healthcare system (Lupton, 2014):

- Implement Telehealth: medical consultations, clinical diagnosis and healthcare delivery offered remotely through digital technologies.
- Develop medical education, training and information exchange between physicians and other healthcare providers using digital technologies for training professionals and users.
- Realise digital diagnostic, genomic, risk assessment and decision-making technologies: including apps, online tools and aggregation of technologies to smartphones for use by physicians.
- Implement digitised devices to administer medication or regulate/improve bodily functions (cochlear implants, heart monitors, insulin pumps, digital pills, etc.).
- Develop health informatics, such as electronic patient records and other online health information and appointment booking.
- Carry out digital health promotion: dissemination of health education messages through ICT.
- Biometric tracking, monitoring devices and patient self-care: apps, smartphones, smart objects and wearable technologies to monitor and track body functions and activities.
- Develop patient blogs as well as patient information sharing platform websites.
- Enrolling in drug trials and crowdfunding for medical research.
- Digital epidemiology: tracking disease outbreaks and spread through digital means.
- Producing human tissue through 3D printing.
- Treating phobias through virtual reality: developing, through the use of technologies such as big data, an artificial intelligence algorithm that predicts heart disease and stroke.

CONCLUSION

Faced with the health emergency situation and the public health measures adopted, health systems are organising their medical care by adopting digital solutions and advanced technological tools in order to be able to offer health services and provide continuity of care to the general population. This generates unprecedented levels of use of Information and Communication Technologies by the healthcare system, healthcare professionals and citizens, as well as unprecedented levels of development and application.

In Andalusia, as is the general trend in Spain, the population's current use of ICT shows a paradigm shift in the doctor-patient relationship. The recently published report on digital transition in Andalusia: realities and challenges shows that during 2020, 49% of Andalusian internet users aged 16-74 years searched for information on Google about health, medicine or illnesses suffered by themselves, family or friends (ONTSI, 2020). Furthermore, 84% of the Andalusian population is aware of the existence of

technological devices to measure aspects related to their health, and 69.3% use these technologies. With regard to healthcare through digital and technological devices in primary care, 51.9% of the population have a positive assessment insofar as they believe that the use of these devices avoids visits to the health centre, which are sometimes unnecessary. With regard to health monitoring, 75% of SAS users in Andalusia demand and want to receive information about their health on their technological devices.

After the experience of the first wave of the COVID-19 pandemic in Andalusia, and the response of the SAS, it could be said that telemedicine and the use of ICT by citizens and healthcare professionals is a reality rather than a trend. However, the healthcare crisis has also put the SAS's capacity for technological response and modernisation to the test, showing that there are still many opportunities for improvement in order to achieve optimum levels of technological and digital revolution in the healthcare system. In this sense, many questions remain to be resolved about the future scenario of ICT and the health system, as the author Carbajo (2020) suggests: "Will it be possible to narrow down the reason for consultation with a simple screening through a mobile device to attend in person only those patients who require a clinical assessment? Can we know if the massive use of telemedicine will bring us more evidence in favour than against; can the implementation of ICT generate a more efficient system; can ICT be used for health promotion; Why not integrate some of these technological solutions in the operating systems so that the professionals are the ones who provide feedback to the patient? (p. 179). So there are many unresolved questions and the current COVID-19 pandemic can be a great opportunity for change and leadership to achieve a major digital transformation of the national health system.

REFERENCES

- Arroyo, M., & Díaz, E. (2021). Digital technologies in the field of health: social gaps, accessibility and depersonalization [Las tecnologías digitales en el ámbito de la salud: brechas sociales, accesibilidad y despersonalización]. *Teknokultura. Rev de Cultura Digital y Movimientos Sociales*, 18(2), 95–101. doi:10.5209/tekn.75516
- Carbajo, L. (2020). COVID-19 and digital transformation opportunity [COVID-19 y oportunidad de transformación digital]. *Rev Clín Med Fam*, 13(3), 177–179.
- Castaño, C., Martín, J., & Luis Martínez, J. (2011). The digital gender gap in Spain and Europe: measurement with composite indicators [La brecha digital de género en España y Europa: medición con indicadores compuestos]. *Rev REIS*, 136(1), 127–140. doi:10.5477/cis/reis.136.127
- Economic and Social Council of the Andalusian Regional Government. (2020). *Digital transition in Andalusia: realities and challenges* [Transición digital en Andalucía: realidades y desafíos]. <https://bit.ly/3knSCP7>
- Fernández, L. C., Juárez, J. C., & Monte, E. (2021). Health 2.0: new communication tools for the professional practice of hospital pharmacy [Salud 2.0: nuevas herramientas de comunicación para el ejercicio profesional de la farmacia hospitalaria]. *Rev Farmacia Hospitalaria*, 36(5), 313–314. doi:10.1016/j.farma.2011.08.001

The Role of New Technologies During the COVID-19 Syndemic in the Andalusian Health System

Fernández, L. M., Gordo, M. Á., & Laso, S. (2016). Nursing and Health 2.0: ICT resources in the health field [Enfermería y Salud 2.0: recursos TICs en el ámbito sanitario]. *Rev Index de Enfermería*, 25(1-2), 51–55.

Golinelli, D., Boetto, E., Carullo, G., Nuzzolese, A. G., & Landini, M. P. (2020). Adoption of Digital Technologies in Health Care During the COVID-19 Pandemic: Systematic Review of Early Scientific Literature. *Journal of Medical Internet Research*, 22(11), e22280. doi:10.2196/22280 PMID:33079693

Horton. (2020). *COVID-19 is not a pandemic*. <https://bit.ly/3Hiziwn>

National Statistics Institute. (2020). *Survey on Equipment and Use of Information and Communication Technologies in Households* [Encuesta sobre Equipamiento y Uso de Tecnologías de Información y Comunicación en los Hogares]. <https://bit.ly/3bZJQC0>

Keesara, S., Jonas, A., & Schulman, K. (2020). COVID-19 and Health Care's Digital Revolution. *The New England Journal of Medicine*, 382(23), e82. PMID:32240581

Law 2/1998, de 15 de June, Health of Andalusia. State official newsletter de Salud de Andalucía. State official newsletter, 185, de 4 de agosto de 1998, 26392 a 26407. <https://bit.ly/2ZXEOp>

Lupton, D. (2014). Critical perspectives on digital health technologies. *Sociology Compass*, 8(12), 1344–1359. doi:10.1111oc4.12226

March, J. C. (2019). Health 2.0 and social marketing. (La salud 2.0 y el marketing social). *Rev Horizonte Sanitario*, 18(2), 97–99.

Ministry of Health of the Government of Spain. (2020). Health Equity and COVID-19. Analysis and proposals to address epidemiological vulnerability linked to social inequalities [Equidad en Salud y COVID-19. Análisis y propuestas para abordar la vulnerabilidad epidemiológica vinculada a las desigualdades sociales]. Government of Spain.

OCDE. (2020). *Digital Transformation in the Age of COVID-19: Building Resilience and Bridging Divides*. Digital Economy Outlook 2020 Supplement. <https://bit.ly/3BWCTfB>

Olarte, O. (2017). Digital divide, poverty and social exclusion. Labor Issues [Brecha digital, pobreza y exclusión social]. *Rev Temas Laborales*, (138), 285–313.

ONTSI. (2020). *Dossier of Indicators of the Digital Society by gender* [Dossier de Indicadores de la Sociedad Digital por género]. <https://bit.ly/3mx7qcF>

Pérez-Escoda, A., Lena-Acebo, F. J., & García-Ruiz, R. (2021). Digital gender gap and digital competence among university students [Brecha digital de género y competencia digital entre estudiantes universitarios]. *Rev Aula Abierta*, 50(1), 505–5014. doi:10.17811/rifie.50.1.2021.505-5014

Pérez-Laurrabaquio, Ó. (2021). COVID-19 in Spain: first wave of the emergency [COVID-19 en España: primera ola de la emergencia]. *Rev Med Gen Fam*, 10(1), 3–9. doi:10.24038/mgyf.2021.007ç

Prieto, M. Á. (2020). *Repercussions of confinement by COVID-19 in chronic patients in Andalusia* [Repercusiones del confinamiento por COVID-19 en pacientes crónicos de Andalucía]. *Rev Gac Sanit*. doi:10.1016/j.gaceta.2020.11.001

Regional Ministry of Health and Families of the Andalusian Regional Government. (2021). *COVID-19 report in Andalusia* [Informe COVID-19 en Andalucía]. <https://bit.ly/3wqonLW>

Sánchez-Villena, A. R., & De La Fuente-Figuerola, V. (2020). COVID-19: quarantine, isolation, social distancing and confinement, are they the same? [COVID-19: cuarentena, aislamiento, distanciamiento social y confinamiento, ¿son lo mismo?]. *Rev. Anales de Pediatría (Barcelona, Spain)*, 93(1), 73–74. doi:10.1016/j.anpedi.2020.05.001 PMID:32507611

Sáinz, M., Arroyo, L., & Castaño, C. (2020). *Women and digitization. From gaps to algorithms. Institute for Women and for Equal Opportunities [Mujeres y digitalización. De las brechas a los algoritmos. Instituto de la Mujer y para la Igualdad de Oportunidades]*. Ministry of Health of the Government of Spain.

Singer, M., & Clair, S. (2003). Syndemics and Public Health: Reconceptualizing Disease in Bio-Social Context. *Medical Anthropology Quarterly*, 17(4), 423–441. doi:10.1525/maq.2003.17.4.423 PMID:14716917

Song, Y., Qian, C., & Pickard, S. (2021). Age-Related Digital Divide during the COVID-19 Pandemic in China. *International Journal of Environmental Research and Public Health*, 18(21), 11285. doi:10.3390/ijerph182111285 PMID:34769801

World Health Organization. (2010). *Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth*. <https://bit.ly/3onKzmy>

World Health Organization. (2019). *Plan estratégico de preparación y respuesta para la enfermedad por coronavirus 2019 (COVID-19) - Pautas para la planificación operativa de la preparación y la respuesta de los países*. <https://bit.ly/30fBLXp>

World Health Organization. (2020a). *A new Strategic Preparedness and Response Plan was published on 24 February 2021*. <https://bit.ly/3n8a7ok>

World Health Organization. (2020b). *Novel Coronavirus (2019-nCoV): situation report, 3*. <https://bit.ly/30eaYe6>

Xiao, H., Zhang, Y., Kong, D., Li, S., & Yang, N. (2020). The Effects of Social Support on Sleep Quality of Medical Staff Treating Patients with Coronavirus Disease 2019 (COVID-19) in January and February 2020 in China. *Medical Science Monitor*, 26, e923549. doi:10.12659/MSM.923549 PMID:32132521

ADDITIONAL READING

Anthony, B. Jnr. (2020). Use of Telemedicine and Virtual Care for Remote Treatment in Response to COVID-19 Pandemic. *Journal of Medical Systems*, 44(7), 132. doi:10.1007/10916-020-01596-5 PMID:32542571

Fernández, C., Ruiz, V., & Couñago, F. (2020). COVID-19 and information and communication technology in radiation oncology: A new paradigm. *World Journal of Clinical Oncology*, 11(12), 968–975. doi:10.5306/wjco.v11.i12.968 PMID:33437658

Jedamzik, S. (2019). Digitale Gesundheit und Pflege: Die Zukunft ist jetzt. *Der Unfallchirurg*, 122(9), 670–675. doi:10.1007/00113-019-0672-2 PMID:31143981

Labrique, A., Vasudevan, L., Mehl, G., Roskam, E., & Hyder, A. A. (2018, October 10). Digital Health and Health Systems of the Future. *Global Health, Science and Practice*, (6), S1–S4. doi:10.9745/GHSP-D-18-00342 PMID:30305334

Mitchell, M., & Kan, L. (2019). Digital Technology and the Future of Health Systems. *Health Systems and Reform*, 5(2), 113–120. doi:10.1080/23288604.2019.1583040 PMID:30908111

Ricciardi, W., Pita Barros, P., Bourek, A., Brouwer, W., Kelsey, T., & Lehtonen, L. (2019). Expert Panel on Effective Ways of Investing in Health (EXPH). How to govern the digital transformation of health services? *European Journal of Public Health*, 29(3), 7–12. doi:10.1093/eurpub/ckz165 PMID:31738442

Yang, G., Zhang, H., & Yang, Y. (2020). Challenges and Countermeasures of Integrative Cancer Therapy in the Epidemic of COVID-19. *Integrative Cancer Therapies*, 2. Advance online publication. doi:10.1177/1534735420912811 PMID:32178547

Yang, S., Fichman, P., Zhu, X., Sanfilippo, M., Li, S., & Fleischmann, K. R. (n.d.). The use of ICT during COVID-19. *Proceedings of the Association for Information Science and Technology*, 202057(1), e297. doi:10.1002/pra2.297 PMID:33173819

KEY TERMS AND DEFINITIONS

COVID-19: Highly contagious respiratory disease caused by the SARS-CoV-2 virus.

Digital Divide: Refers to the difference in access to and knowledge of the use of new technologies. It is often determined on the basis of different criteria, e.g., economic, geographical, gender, age or between different social groups.

E-Patient: Is a term that has started to be used in eHealth, and refers to the patient or potential patient who uses health services using technological tools, feels committed to the management of their health on the same terms as a health professional, is at the same time a user of Web 2.0 tools and is able to manage health services and search for information through electronic communication tools.

Health 2.0: Is the renewal of the traditional concept of Health, where new methods, means, tools and forms of communication improve the management of the process of monitoring people's health.

ICT: Are the set of technologies developed today for more efficient information and communication, which have changed both the way of accessing knowledge and human relations.

Social Inequalities in Health: Systematic and potentially avoidable differences in one or more aspects of health across socially, economically, demographically or geographically defined populations or population groups.

Syndemia: Is the sum of two or more concurrent or sequential epidemics or disease outbreaks in a population with biological interactions, which exacerbate the prognosis and burden of disease.

Telemedicine: Aims to improve a patient's health by enabling real-time interactive communication between the patient and the remote physician or practitioner. This electronic communication involves the use of interactive telecommunications equipment including, as a minimum, audio and video equipment.

ENDNOTES

1 The international bodies of the WHO, the World Organisation for Animal Health and the Food and Agriculture Organisation of the United Nations determine that the name of the virus must meet certain conditions: 1) not refer to a geographical location, 2) not refer to an animal, 3) not refer to an individual or a group of people, be easy to pronounce, and be related to the disease. WHO (2020). Novel Coronavirus (2019-nCoV) Situation Report -10. WHO, 2020.

2 In the case of Spain, this first pandemic wave covers the period from 31 January to 21 June 2020.

3 Although the state of alarm was initially provisional from 15 to 29 March, it was extended until 21 June, the date on which the Plan for de-escalation and return to “normality” begins after the end of the first pandemic wave. Óscar Pérez-Laurrabaquio. 2021, COVID-19 in Spain: first wave of the emergency. *Med Gen Fam* v10n1. 2020.

4 It should be recalled that as of 15 March the incidence was 11,488 positives: 41% were hospitalised, 8% in intensive care and 3% died. And from 30 March to 12 April, the period of the second extension, the incidence has increased so much that Spain is in third and second place in the world in confirmed diagnoses and fatalities, respectively. The WHO report (2020) states that as of 31 March there were 750,890 cases, with the United States as the new epicentre of the pandemic (140,640), Italy (101,739) and Spain (85,195); of the 36,405 deaths, Italy accounted for 32% (11,591), Spain 20% (7,340) and China 9% (3,314).

5 Please note the following information for a better reading of the pyramid. The periods covered by dates are: Period 1: until 10 May 2020. Period 2: from 11 May to 20 December 2020. Period 3: from 21 December 2020 to 7 March 2021. Period 4: from 8 March to 20 June 2021. Period 5: from 21 June 2021 onwards.