



RESEARCH ARTICLE

Aging Management Strategies during the COVID-19 Epidemic Crisis in the Republic of Costa Rica

Robert S Gutiérrez-Murillo^{1,2,3*} 

¹Federal University for Latin American Integration (UNILA), Brazil

²MSc. Student in the Postgraduate Program in Gerontology, European University of the Atlantic, Spain

³Resident in the Multiprofessional Program in Family Health, UNILA, Brazil

*Corresponding author: Robert S Gutiérrez-Murillo, Universidade Federal da Integração Latino-Americana, Brasil; Mestrando no Programa de Pós-graduação em Gerontologia, Universidad Europea del Atlántico, Espanha; Residente no Programa Multiprofissional em Saúde da Família, UNILA, Brasil, Tel: +5545988406824



Abstract

Background: The purpose of this investigation was to examine the current hygienist interventions followed by the Republic of Costa Rica, in the context of COVID-19's combat and prevention in the aged population.

Methods: This investigation featured a documentary analysis, with qualitative slant and analytical-descriptive approach. Comprehensive lectures were conducted on specific national guidelines; epidemiological bulletins; specific health regulations for COVID-19; strategies, guidelines and recommendations; sectorial protocols addressing planning and management strategies for aging during the health crisis.

Results: National statistics among older adults have indicated a low coefficient of infection ($n = 9,571$; 6.9%), yet the greatest mortality coefficient ($n = 1,144$; 67.7%) in the country. Currently, $n = 3,584$ older adults are under monitoring and $n = 4,843$ have already recovered from the disease. With such an epidemiological scenario, the RCR has decreed five official documents, guiding all actions by the public and private sectors, in order to offer comprehensive care for aging citizens.

Conclusions: It is befitting to admit that the hygienist interventions adopted by the RCR provide the capabilities for the system to meet the specific needs of its aged population during the epidemic crisis. Notwithstanding, the main challenge refers to the reduction of infection and mortality coefficients in Costa Rican older adults.

Abbreviations

MHRCR: Ministry of Health of the Republic of Costa Rica; RCR: Republic of Costa Rica; SARS-CoV: Severe Acute

Respiratory Syndrome; NGES: National Guidelines for Epidemiological Surveillance; HR-COVID19: Health Regulations for COVID-19; NSGR: National Strategies, Guidelines and Regulations; SPs: Sectorial Protocols; CRSST: Costa Rican Social Security Trust

Introduction

The worldwide social and sanitary emergency caused by the new manifestation of the coronavirus, known as Severe Acute Respiratory Syndrome (SARS-CoV), is to be considered one of the most significant epidemics in human history. In a sanitary perspective, pandemics are seen as infectious diseases that spread over large regions, occurring around the world at almost the same time, showing high coefficient of morbidity and mortality as the final product; consequently, representing greater challenges in the social, economic and political spheres in the affected territories [1].

Recent information indicates that the disease that SARS-CoV-2 produces is COVID-19, where 'CO' means crown; 'VI' virus and 'D' disease [1]. Coronavirus types are grouped into four (alpha; beta; delta and gamma); where it has been reported that only alpha and beta types infect humans [2]. This syndrome has high index of genetic mutation and poor resistance to lofty temperatures (56 °C) for thirty minutes; ethanol (75%); disinfectants containing chlorine and peracetic acid [3].

COVID-19 has been portrayed as a disease with a



Citation: Murillo RSG (2021) Aging Management Strategies during the COVID-19 Epidemic Crisis in the Republic of Costa Rica. Int Arch Public Health Community Med 5:061. doi.org/10.23937/2643-4512/1710061

Accepted: August 18, 2021; **Published:** August 20, 2021

Copyright: © 2021 Murillo RSG. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

high capacity for infection; though with low coefficient of lethality [1]. The pattern of transmission can occur in all age groups in the same way, withal, the global epidemiological profile points to the older adults and individuals with clinical record of comorbidities as the main vulnerable groups [1,3,4]. On January 12th, 2020, the World Health Organization - WHO disclosed COVID-19 as an epidemic disease, encouraging all health organizations, national and international, to strengthen preventive measures, epidemiological monitoring and surveillance [5].

As of November 27, 2020, biomedical and biotechnological fact-findings have bundled incomplete results in developing a pharmacological treatment, lessening itself to purely symptomatic control interventions. It is thought that the lungs are the main affected organs, precisely because the pathological replication on other parts of the human body has not been well tagged [4,5]. Although pharmacological treatment has not hitherto been registered by any country, it serves to inform that over 1,500 trials have been submitted to clinicaltrials.gov, most of which have slanted on a therapeutic approach [4].

Said so, it becomes an indisputable fact that COVID-19 shows as the main challenge for the health and social assistance systems the swift capacity for colonization and infection of SARS-CoV-2, being snapper and more effective than the physical and social barriers assented by governments as measures of spread control and prevention.

Such threat further aggravates the socio-sanitarian scenario, when considering questions such as: The high demand for assistance due to suspicion; admission rate in intensive care unit; financial expenditures for hospitalization and hospital intubation; number of available hospital beds; organization of local assistance networks and long working hours for health professionals. It is also important to bear in mind, that global aging will create widespread public health challenges, dramatically increasing the burden of noncommunicable diseases and exposing our vulnerability to infectious diseases [6]. Hence, the epidemiological scenario worldwide visualizes such assertion not differing from reality.

Another consideration ought to be made on the weight of social inequities and the presence of many vulnerable groups, now be the case of older adults. By and on itself, the issue is even more complex than it appears. With the process of isolation, the social bonds are depleted, or even exhausted, changes come incorporated into the daily life of the older adults, causing the need to work on resilience and selfcare interventions.

Far from being just an academical task, the comprehension of how the Republic of Costa Rica (RCR) addresses the COVID-19 pandemic sets off a current and

further public health matter for the Americas, namely, for the Central American region. Therefore, in the Latin American panorama of Public Health emergency by COVID-19, it is worth rescuing the sight of the Central American continental scene, since it is the subregion of the American Continent with the lowest number of cases due to contagion and the lowest mortality rate, currently (November, 2020).

With the broad social and hygienic limitations that characterize the majority of those countries, the interests of knowing how, where and which are the hygienist interventions adopted by the Costa Rican government, arose in relation to its institutional health framework; health management model (with a special view to its health surveillance system) and health care conditions to address aging during an epidemic crisis. Furthermore, understanding the magnitude of the international health situation, in relation to COVID-19's pandemic decreed by the WHO, and precisely with the objective of providing the current hygienist knowledge for the control and management of infectious diseases of public interest, this manuscript embraces the challenge to analyze the main preventive health interventions approaching the aging population in the context of Costa Rican Public Health.

Methods

Study design

This investigation featured a documentary analysis, with qualitative slant and analytical-descriptive approach. The present manuscript constituted a critical reading of documents in the public domain and of secondary origin, with immediate access through the internet, available on the official website of the Ministry of Health of the Republic of Costa Rica (MHRCR) [7].

By and on itself, the MHRCR is an institution that directs and leads the social actors for the development of actions that protect and improve the physical, mental and social health status of the inhabitants, through the exercise of the stewardship of the National Health System, with a focus on health promotion and disease prevention, fostering a healthy and balanced human environment, under the principles of equity, ethics, efficiency, quality, transparency and respect for diversity.

Setting (Study arena)

The RCR is one of the less populated nations, being located in the heart of Continental Central America, comprised into 51,000 square kilometers. It is divided into seven provinces (San José, as Permanent State Capital since 1838), counting down a grand total of 81 municipalities and 473 districts. The national territory is conformed between the Caribbean Sea, the Pacific Ocean and the Republics of Nicaragua (to the North) and Panama (to the South).

Table 1: Republic of Costa Rica's national socio-sanitary profile, 2020.

Item/Year	Description
Total population (2019)	5,048,000 inhabitants
Aging population rate (2019)	11.4%
Crude birth rate (2015-2020)	22.8%
Crude mortality rate (2015-2020)	5.0%
Life expectancy at birth (2015-2020)	± 80 years (83 years men; 77 years women)
Migration rate (2015-2020)	0.8%
Public spending on education, according to % of GDP (2017)	7.4% (the largest in the Central American region)
Public spending on health, according to % of GDP (2015)	8.1% (the largest in the Central American region)
Public social spending, according to % of GDP (2016)	12.3%
Maternal mortality ratio (2017)	27.0 (0/000)
Unemployment rate (2018)	10.3%
Gini's coefficient (2017)	0.5
Poverty's proportion (2017)	15.1%
Proportion of extreme poverty (2017)	3.3%
Proportion of people accessing sources of improved water supply (2015)	97.8%
Proportion of population accessing improved basic sanitation settings (2015)	94.5%

In preview research [8], the RCR was titled to be the nation that projects better socio-sanitarian living conditions, being the most favorable country for human development in the continental Central American region (according to its economic, social and health indexes). In agreement with that statement, Table 1 highlights its national socio-sanitary profile [9].

Data collection

The section "All about COVID-19 Coronavirus" was accessed, being a virtual portal designed by the MHRRCR itself, whose main objective is to make scientifically proven information available; to present and store daily epidemiological reports on the behavior of COVID-19 in the country and to clarify pertinent questions among the population [7].

In that sense, this work observed official documents of the type: National Guidelines for Epidemiological Surveillance (NGES); Health Regulations for COVID-19 (HR-COVID19); National Strategies, Guidelines and Recommendations (NSGR) and Sectorial Protocols (SPs). Notwithstanding, it is worth mentioning that official documents on the COVID-19 published by the WHO and scientific bibliography were also approached as references for discussion.

Data analysis

As for structural purposes, this study consisted of three stages. The first analytical stage consisted of the identification and distribution of official documents, according to its type, publication date, coverage area and version (preliminary or final).

The second stage continued with the comprehensive reading of filtered documents, through which the main information that dealt with preventive health

interventions against COVID-19 was extracted. That same moment helped to discard transitory documents and/or that did not comply with the inclusion criteria. At the same time, the inclusion criteria were to be an official document approved and disclosed by the MHRRCR or based on its technical regulations addressing the aged population, and the exclusion criteria were to be a document with repeated information and/or from a non-governmental source.

In the third and last analytical stage, taken as the moment for discussion of the hygienists interventions, a biopsychosocial approach to the *health-disease-care* cycle was privileged, alluding to a comprehensive understanding of the State's position, through the premises of health surveillance (sanitary and epidemiological); humanized assistance and comprehensive care; sanitary laws and mechanisms of health communication and education.

Results

Because the general knowledge and epidemiological situation of this new coronavirus are in an evolutionary and dynamic condition, both in the local and international context, these documents are being reviewed periodically and the current versions will be published on the MHRRCR's website [7]. Table 2 contains the official documents pointed-out throughout data collection.

As of November 27, 2020, the epidemiological behavior of COVID-19 showed the following characteristics [10]:

- The country registered a grand total of $n = 137,093$ positive cases, being 85.7% nationals and 14.3% foreign. Of those $n = 70,505$ (51.4%) were men and $n = 66,588$ (48.6%) women;

Table 2: Official documents addressing COVID-19 prevention, suspicion and contagion in Costa Rican older adults, 2020.

Type	Published On	Description
NSGR	May, 2020	Technical guidelines for prevention and containment of COVID-19 outbreaks in public and private health facilities
NGES	July, 2020	National Guidelines for COVID-19 disease surveillance
SPs	April, 2020	Communication strategy: comprehensive proposal for the protection of older adults from COVID-19
NSGR	April, 2020	Care guideline for older adult assistance throughout COVID-19 emergency
NSGR	July, 2020	General Guidelines on the use of mask at the community level in the framework of the alert by COVID-19
HR-COVID-19	August, 2020	COVID-19 Guidelines for private, non-profit, long-term care homes for older adults in an emergency

- Among the positive cases, n = 50,412 (36.8%; ± 37.7 years-old) are still under monitoring, that is, they are considered as active cases. Of those, n = 25,506 (50.6%) are men and n = 24,906 (49.4%) women;
- Between people who received positive diagnosis for SARS-CoV-2, n = 89,991 (65.25%; ± 37.2 years-old) have already recovered. That is n = 43,950 (49.9%) men and n = 41,041 (50.1%) women;
- Fatalities have summed up n = 1,690 deceases (1.23% lethality coefficient; ± 70.4 years-old). Of those, n = 1,049 (62%) were men and n = 641 (38%) women;
- National statistics among older adults have indicated a low coefficient of infection (n = 9,571; 6.9%), yet the greatest mortality coefficient (n = 1,144; 67.7%) in the country. Currently, n = 3,584 older adults are under monitoring and n = 4,843 have already recovered from the disease.

Discussion

In view of the countless challenges arising from the social phenomenon of population aging, comprehensive care to the socio-sanitary needs characteristic of older adults is one of the most complex and dynamic tasks in the context of the public health systems; either due to the heterogeneity inherent in that population segment, well by the marked functional frailties attributed to the aging process. It should be noted that the accelerated growth of aged population has acted as an alert to the Costa Rican government, as well as to the private initiative, for the obligation to promote social policies that prepare society for that phenomenon.

The determination of health conditions in older adults should consider their global state, that is, take into account a satisfactory level of functional independence and not just the absence of diseases [11]. This study shows a comprehensive position regarding the care and accompaniment of older adults by RCR during the COVID-19 health crisis. The existence of a universal and equitable framework, which proposes respect

for ethnic-racial characteristics; functional capacity; Socioeconomic profile and degree of access to health services can be considered as a successful intervention by the government.

Referring specifically to COVID-19 outcomes in the Costa Rican territory, it is fair to say that the government's concern for older adults (22.8% of its grand total population) has not been obviated, as several intersectoral interventions have been enacted, in both public and private sectors. The public universal health care and coverage system, led by the MHRRCR and the Costa Rican Social Security Trust-CRSST (*Caja Costarricense del Seguro Social*, from Spanish), has been lauded as one of the main reasons for the country's health achievements including extended longevity, low childbirth and infant mortality [12], as stated in Table 1 [9]. More than that, the possibility of carrying out epidemiological traces and great technical and innovative capacity have been some of the major weapons used against COVID-19 by the RCR [13].

As for the MHRRCR general interventions, Chaves, et al. [12] time-lined the COVID-19 preparation, mitigation and suppression measures adopted by the country up to April 4th, 2020:

- First imported COVID-19 case, a mildly symptomatic tourist coming from the United States of America. Quarantine of people with detected infections was announced (March 6th, 2020; Preparation and Mitigation);
- Encouragement of physical distancing (March 11th, 2020; Suppression I);
- Closure of public spaces, suspension of classes at all levels and closure of international borders to non-citizens or legal residents. On March 16th, the president and health minister declared national emergency, through executive bill 42227-MP-S (March 15th - 19th, 2020; Suppression I);
- Vehicular transit restriction for cars between 10 p.m. (8 p.m. on weekends) and 5 a.m. Closure of all beaches and religious temples (March 23rd - 27th, 2020; Suppression II);

- Free transit forbidden between 5 p.m. and 5 a.m. All long-distance public transportation (between different cities or metropolitan areas) was forbidden; free transit of private cars furtherly banned (April 1st, 2020; Suppression II).

Aforesaid authors concluded that suppression and mitigation measures have been effective in Costa Rica, potentially averting many COVID-19 cases and deaths from this emerging pathogen [12]. In like manner, it is not too platonic to think of a vaccine against COVID-19 as the most effective hygienist intervention, counteracting the coefficient of contagion and, thus, reducing the mortality coefficient in the country, especially in the aged Costa Rican population.

Nonetheless, as stated by Ulloa-Gutiérrez, et al. in the era of new vaccines against common and serious diseases, LA countries should make great efforts to document the epidemiology of these diseases prior to and after the introduction of vaccines [14]. Additionally, Zhang; Jiang & Duemphasize that the establishment of effective small animal models for MERS infection will allow economical and practical detection of protective efficacy of designed vaccines against challenges from both single and multiple MERS-CoV strains potentially occurring in humans [15].

The application of hygienist measures for epidemiologists and medical records personnel of public and private hospitals are mandatory, throughout the national territory, as part of the preventive and mitigation actions dictated by the MHRRCR for the attention of the alert by COVID-19. The operational definitions to be applied for the identification of cases and contacts as appropriate, are published by the MHRRCR. They should be honored by responsible officials such as physicians/clinicians, nurses and epidemiology personnel dealing with COVID-19 outbreaks. These definitions include case management, contacts and sanitary measures that are given by the MHRRCR [16].

Like younger populations, older adults can also present clinical manifestations such as fever (98%), cough (76%), dyspnea (55%), myalgia-fatigue (44%), odynophagia, dysgeusia, hyposmia, headache, or gastrointestinal disorders; however, in senescent people, attention should be paid to anorexia and delirium as other manifestations of COVID-19 [17].

The main communication and health education strategies have set to sensitize and educate the aged population in all the national territory about the risks of COVID-19 and the pertinent and official measures to reduce the risk of contagion, as well as the timely detection of the virus [18]. Likewise, the aforementioned strategies are aimed at:

- Detecting COVID-19 at an early stage is essential to be able to identify older adults who have it and thus be able to stop or delay its spread in this vulnerable population;

- Establish direct communication mechanisms, focused on the target population with regard to symptoms, physical distance and hygiene habits;
- Articulate with the groups and social organizations that serve the different populations, to guarantee that the guidelines issued are reaching those interested.

These pioneering objectives were pictured through a multisectoral perspective, with the help of national press (TV news and radio forecasting), approaching their families by social networks and text messages, exclusive telephone line for individualized and comprehensive attention (Golden Line #1322), disclosure of drugs request through an exclusive telephone line, articulated visits with the Care Networks and the contributions of faith organizations [18].

Be that as it may, it is worth pointing out that the Costa Rican aging population is heterogeneous, both physiologically and also in its socioeconomic condition. Therefore, it became necessary to carry out a classification, in relation to the degree of vulnerability, which led to *category A* (individuals living alone, in poverty, without access to digital media and with an income coming from the non-contributory regime); *category B* (with some scholarship, many being caregivers, living in rural areas, living with some economic limitations but with an income minor to the previous group, in some cases residing in long-term institutions) and *category C* (with greater scholarship, with economic means, with access to digital media, with family support and living in urban towns) [18].

The perspective of comprehensive health care for older adults has led to the adoption of the principle of *intersectoriality*. In such a way that all proposed interventions take into consideration the articulation of all public bodies concerned with the care of the aged population. Such organs are: National Council of the Aged, MHRRCR, CRSST, National Institute of Social Aid and National Commission for Emergencies [19].

In case of identifying an older adult with suspicious symptoms of COVID-19, it must be reported immediately to the corresponding health area for the appropriate approach according to the general hygienist guidelines [19]. Besides, in case of identifying unsatisfied basic needs (medicines, food, drinking water or others), they must be addressed in coordination with the Municipal Emergency Committee and other actors identified at the local level [16,19,20].

A risk scale was also instituted, in relation to the degree of vulnerability and the pathological profile. This risk scale considers three possible groups, being: *red* (people over 80-years-old, with aggravating health conditions <chronic diseases>, living alone and in poverty, with unmet needs); *yellow* (people over 60-years-old, with aggravating health conditions <chronic diseases>,

living alone and under any socioeconomic condition, with unmet needs) and *green* (people over 60-years-old, with aggravating health conditions <chronic diseases> and under any socioeconomic condition) [19].

The compulsory nature of wearing a mask as a protection equipment among the population configures recent health regulations, having been decreed on July 21, 2020 [21]. As far as the aging population is concerned, the usage of masks is a demanded fact, especially for those who take care for the others alike and people with disabilities, especially those who provide this service in nursing homes and other residential alternatives [21].

As part of its duties, it is the State's responsibility to protect the right to life as a fundamental principle. It involves guaranteeing social and health care at every stage of life so that people maintain their well-being from the mental, physical and spiritual point of view; managing to reach old age with optimal functional capacity. All along, the Costa Rican 2018-2020 action plan on aging is structured into five axes, namely: 1) Multisectoral commitment to healthy aging; 2) Healthy environments that promote aging; 3) Socio-sanitarian services; 4) Long-term care delivery system and 5) Research and evaluation [22].

In the current context of public health crisis, the Health System and derivatives services must adapt a person-centered approach to address his/her needs in multiple dimensions in a comprehensive, articulated and continuous manner. In cases where an older person's capacity has decreased drastically (now be the case of COVID-19 infection), it may also be important to provide care through assistive technologies. Thusly, recent studies have proven the emergence of e-Health and telemedicine as applicable, desirable and acceptable advents, that help in the management of COVID-19 cases. On the other hand, such technologies have also shown good results as for staff's protection and contagion coefficient reduction [23].

Considering the multisectoral commitment to healthy aging, the challenges must be assumed by public institutions to integrate healthy aging in all policies and at all levels and sectors of the State. However, the scenario in here discussed may not favor such a position, to the extent that the health system and derivatives services are merely saturated, requiring the incorporation of more stringent measures [24]. Long-term facilities for older adults are considered sensitive spaces because they are collective living environments. Therefrom, special regulations were enacted to guide the medical and humanitarian care provided in these institutions [25]. Among the main interventions decreed, it is worth noting: physical spacing to limit the spread of coronavirus in Long Term Care Homes; intensified surveillance in the dorms and individualized feeding schedules; mental health care for staff and older adults; waste handling (cleaning and disinfection procedures);

preventing visits to non-relatives; special older adult's assessment by the health and social personnel and the strengthening of actions proposed by the National Council on Older Persons [25].

In addition, it is necessary to implement health promotion mechanisms to adapt social, economic or physical environments in ways that help older adults preserve and increase their health profile. More than that, in all settings, it must be ensured that the system brings together the many essential components, namely: A robust regulatory framework; training and support for caregivers; and coordination and integration in the various sectors and mechanisms [22].

Finally, researching and evaluating COVID-19 outcomes in the Costa Rican territory can help to better understand trends and problems related to age: Current characteristics of symptomatic older adults and its determining factors; behavior of inequalities; interventions that work to promote healthy aging and its implementation mechanisms throughout the health crisis; health care and long-term care needs of older people with the disease and expenditures and benefits in the context of COVID-19 surveillance.

Conclusions

To the best of my knowledge, this is the first manuscript that investigated the preparation, mitigation and suppression measures addressing people over 60-years-old in the RCR. Based on the documentary analysis carried out, it can be concluded that the hygienist interventions adopted by the RCR provide the capabilities for the system to meet the specific needs of its aged population during the epidemic's crisis. The strategic plan presented by the MHRCR is shown as an active response to combat and prevent COVID-19 spreads, acting mainly on the form of suppression.

The specific guidelines, orientations and protocols attending the aged population needs reaffirm the State's commitment to care for and promote the health of its citizens, even in the occurrence of uncertain times, led by the COVID-19 epidemic crisis.

Availability of Data and Materials

Data are available by accessing the "All about COVID-19 Coronavirus" MHRCR's website.

Funding

None to declare.

Declaration of Interests

None to declare.

Ethical Approval

All bioethical aspects in health research were followed, since this work did not share characteristics of individuals or institutional information of a confidential

nature. On the contrary, it is to emphasize that all documents reviewed can be immediately accessed, at any time and free of charge.

Competing Interests

None to declare.

References

1. Tuñas ITC, Da Silva ET, Santiago SBS, Maia KD, Silva-Junior GO (2020) Doença pelo coronavírus 2019 (COVID-19): Uma abordagem preventiva para odontologia. *Revista Brasileira de Odontologia* 77: 1-6.
2. Cruz MP, Santos E, Velázquez Cervantes MA, León Juárezc M (2020) COVID-19, una emergencia de salud pública mundial. *Revista Clínica Española* 221: 55-61.
3. Ahmad A, Rehman UM, Alkharfy KM (2020) An alternative approach to minimize the risk of coronavirus (covid-19) and similar infections. *European Review for Medical and Pharmacological Sciences* 24: 4030-4034.
4. Elizalde GJJ (2020) COVID-19. Unanswered issues. *Med Crit* 34: 96-98.
5. Sun P, Lu X, Xu C, Sun W, Pan B (2020) Understanding of COVID-19 based on current evidence. *J Med Virol* 92: 548-551.
6. Koff WC, Williams MA (2020) Covid-19 and immunity in aging populations - A new research agenda. *N Engl J Med* 383: 804-805.
7. (2020) COVID-19 Coronavirus. Ministerio de Salud de Costa Rica. Costa Rica.
8. Gutiérrez-Murillo RS, GamarraCJ, Kühl WS, Kühl NS (2020) Suicide as a Collective Health Problem in Continental Central America: An analysis of the cases consumed between 2010-2016. *RELACult - Revista Latino-Americana de Estudos em Cultura e Sociedade* 6: 1-23.
9. Gutiérrez-Murillo RS (2020) Institucionalização estatal do envelhecimento humano na República da Costa Rica: desafios atuais e perspectivas gerontosanitárias futuras. In: Arthur Bezerra de Souza Junior, Marcelle Mourelle, Rogerio Borba e Roseni Pinheiro, *Estado e Políticas Públicas*. (1st edn), Pembroke Collins, Rio de Janeiro.
10. National situation COVID-19 (2020) Ministerio de Salud de Costa Rica, Costa Rica.
11. Veras RP (2020) A contemporary and innovative care model for older adults. *Rev Bras Geriatr Gerontol* 23: 1-12.
12. Chaves LF, Hurtado LA, Rojas MR, Friberg MD, Rodríguez RM, et al. (2020) COVID-19 basic reproduction number and assessment of initial suppression policies in Costa Rica. *Mathematical Modelling of Natural Phenomena* 32: 1-13.
13. Vassoler-Froelich I (2020) Interview with Andrei Cambronero Torres: Analysis of the COVID-19 pandemic from Costa Rica. *Middle Atlantic Review of Latin American Studies* 4: 5-15.
14. Ulloa-Gutierrez R, Miño G, Odio C, Avila-Agüero ML, Brea J (2011) Vaccine-preventable diseases and their impact on Latin American children. *Expert Review of Vaccines* 10: 1671-1673.
15. Zhang N, Jiang S, Du L (2014) Current advancements and potential strategies in the development of MERS-CoV vaccines. *Expert Review of Vaccines* 13: 761-774.
16. National Guidelines for Disease Surveillance COVID-19 (2020) Ministerio de Salud de Costa Rica, Costa Rica.
17. Leandro-Astorga G, Calvo IB (2020) COVID-19 Infection in Older Adults: Recommendations for Professionals. *Revista Médica de Costa Rica* 85: 44-50.
18. (2020) Communication strategy: Comprehensive proposal for the protection of older persons from COVID-19. Ministerio de Salud de Costa Rica, Costa Rica.
19. (2020) Guide for the care of older adults in territory in the face of the emergency by covid-19. Ministerio de Salud de Costa Rica, Costa Rica.
20. (2020) Guide to Telephone Follow-up for Older Adults in an Emergency by Covid-19. Ministerio de Salud de Costa Rica, Costa Rica.
21. (2020) General guidelines on the use of masks and masks at the community level within the framework of the COVID-19 alert. Ministerio de Salud de Costa Rica, Costa Rica.
22. (2018) National Strategy for Healthy Aging Based on the 2018-2020 Life Course. Direction of Strategic Planning and evaluation of actions in health. (1st edn), San José, Ministerio de Salud de Costa Rica, Costa Rica.
23. Rifat L, Charles R (2020) Perspective on COVID-19: Finally, telemedicine at Center Stage. *Telemedicine and e-Health* 26: 1106-1109.
24. Gutiérrez-Murillo R, Gamarra CJ (2020) Sanitary interventions adopted by the Republic of Costa Rica during the COVID-19 epidemic. *Revista Cubana de Salud Pública* 46: 1-18.
25. (2020) COVID-19 Guidelines for private, non-profit, long-term care homes for the elderly in an emergency. Ministerio de Salud de Costa Rica, Costa Rica.