

# Implementation of the “One Health” Approach against COVID-19 in Nursing Homes and other Social-Sanitary Centres: Our Experience in 59 Centres/3609 Population

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## ARTICLE INFO

**Received:** 📅 April 09, 2021

**Published:** 📅 April 19, 2021

**Citation:** MA Martín, E Quesada, MA Martín, ML Delgado, A Garrido, J de la C Belmonte. Implementation of the “One Health” Approach against COVID-19 in Nursing Homes and other Social-Sanitary Centres: Our Experience in 59 Centres/3609 Population. Biomed J Sci & Tech Res 35(2)-2021. BJSTR. MS.ID.005661.

**Keywords:** One health; Public Health; nursing homes; biosecurity; veterinary; medicine; COVID-19

## SUMMARY

The purpose of this article is to show the result of a collaborative and transdisciplinary effort between human and veterinary medicine (ONE HEALTH) in fading up the spread of the SARS-CoV-2 among nursing homes and other social-sanitary centres in the province of Almería (Spain). The term One Health, although relatively new, is being increasingly used in conferences, communications, and various organizational frameworks that advocate global health. As the results have shown, this approach benefit not only the individual but the entire community, reducing the number of infections and the transmission of the disease in retirement homes, which would have caused a greater number of ill and deceased.

**Results:** Of the total of 59 CREs, which accumulate a total number of 3.609 residents, 93 positive residents were registered, belonging to 6 residential centers for the elderly and none belonging to a socio-sanitary center for the disabled. With regard to employees, out of a total of 1.500 there were 38 confirmed positives, all of them from centres that had confirmed positive residents, except for 3 workers who were COVID-19 positive despite working in a centre with no positives registered. The implementation of the basic principles of biosafety imply the creation of environments in which the care of residents is optimized. It is a priority for Public Health to promote disease-control practices among resident people and employees, as it leads to reducing the risk of exposure to the disease, and therefore the threat posed by COVID-19.

## Introduction

The concept “ONE HEALTH” is a methodological approach conceived to design and apply programs, policies, laws and research in which the different sectors involved communicate and collaborate closely with one another in order to achieve the best results regarding public health, understanding that both human and animal health are interdependent and necessarily linked to the

environment in which they coexist. This strategy is recommended by the World Organization for Animal Health (OIE, 1924) to address the interrelation between Public Health, Animal Health (including both domestic and wild animals), and ecosystems. Many pathogenic microorganisms that represent global risks to public health affect both animals and humans when they share the

same habitat, so to concentrate the efforts into just one sector will not prevent nor eliminate the problem. Examples of this are RNA viruses-retroviruses, such as the human immunodeficiency virus (HIV), the West Nile virus, the avian influenza virus, the Zika virus and, more recently, the coronavirus (SARS, MERS). All these disease outbreaks, including the current COVID-19 pandemic, illustrate how essential these transdisciplinary collaborations are [1].

It therefore becomes clear that a comprehensive protection of public health should be based on the development of global strategies for the prevention and control of pathogens, through the implementation of adequate and coordinated policies that act in the animal-human-ecosystem interface. This is why the FAO Director-General has recently requested in the context of "One Health" the inclusion of veterinarians as specialists in animal health in the prevention and control of COVID-19. Hence, veterinarians play an essential role in the development and implementation of health risk management policies: protecting animals health and welfare and controlling food safety, ultimately public health.

## Objectives

### General

- a. To apply the "One Health" concept to the highly transmissible and serious pandemic caused by SARS-CoV-2 throughout the collaboration between medicine and veterinary.
- b. To establish a multidisciplinary approach that allows the control the virus from all perspectives as well as the understanding of its origin, avoiding new outbreaks.

### Specific

- a. To assist in the evolution and control of the pandemic as well as in the relationship between the virus and animals & humans, applying key concepts such as biosecurity, movement control and generalized diagnostic tests.
- b. To implement early detection and appropriate contingency plans as the best tool to control infectious disease outbreaks in residential centers for the elderly (RCE) for which we do not have effective treatments or vaccines at the present time.
- c. To turn RCE into genuine health fortresses with isolation conditions that prevent the arrival of infectious agents to arrive or, in case they do, their massive spread.

## Methods

A plan with two strategic lines was established.

### Line of Assistance and / or Treatment of the Individual, Developed in turn Through two Action Plans

- a. Preparation and implementation of a clinical management protocol, with daily check-ups of asymptomatic residents,

residents with compatible symptoms and residents with positive PCR test results for COVID-19.

- b. Urgent medicalization and resource endowment of the centers through coordination and cooperation between the nursing homes' staff, the Primary Health Care Districts and the Internal Medicine department of the referral hospital.

### Line for the Prevention of Infection and/or Spread of the Disease Among the RCE Population (Elderly Residents and Employees)

This line is as well divided into five action plans:

- a. Centralization, coordination and distribution of hygiene and personal protection equipment.
- b. Systematic sampling of the RCE population To this effect, PCR and serological tests were performed in order to early identify and contain the infection sources as well as interrupt the chain of transmission. In advanced stages of the disease, Ig-M and Ig-G antibody testing were included using the ELISA technique.

### Request for a Contingency Plan and isolation of Residents with Suspicion or Confirmation of Covid-19, Through the Elaboration of a "Plan of Action" Foreseen by the Health Territorial Delegation

Each center must assume a firm commitment to risk management, leading a systematic implementation of measures to minimize it, and a guarantee from the Management Office to help implementing the Contingency Plan and apply the extraordinary preventive measures recommended by the health authorities. This Contingency Plan, properly documented, must contain at least:

- a. The allocation of authorities for the supervision of compliance with the recommendations and guidelines issued by the health authorities in relation to special measures for COVID-19 and the additional measures contained in the contingency plan.
- b. The allocation of material and human resources.

There must be a detailed list with the available personal protective equipment (PPE), the sanitary hygiene protection products (soap and paper towels, hydroalcoholic solution dispensers, disposable tissues and waste containers, preferably with a pedal-operated lid) and the cleaning/disinfection products (bleach, 62-71% ethanol or 0.5% hydrogen peroxide, detergents and disinfectants with virucidal effect). There must be an estimate of the needs to guarantee the stock, as well as a list of pre-evaluated suppliers with possibility of supplying in case of need. With regard to human resources, the centres must have a file of the available workers by category and by shift, and the ratio of professionals and users. Regarding the Personnel Policy, the company must encourage

employees with symptoms to abstain from going to work, report to the occupational risk prevention department and self-isolate at home for two weeks.

A Personnel Continuity Plan with a substitute employee list should be established in the event of possible work leaves as a result of the epidemic. Centres must determine an action protocol for people with compatible symptoms (cough, fever, shortness of breath, etc.) or who have been in contact with the former.

a) Description of the Centre's infrastructures and Residents' typology

Each Center must have a scale plan that includes all the existing spaces, volumetric and functionality. A description of the infrastructures, number of floors, rooms, number of beds in the rooms, the existence or lack of private bathrooms on each room and the access systems (stairs, elevator, access landings) must be made. Each Center must have sufficient material, structural, organizational and personnel capacity to maintain the isolation of suspected, probable and confirmed cases.

b) Resident Characteristics, including their level of dependency, in order to offer them the appropriate healthcare in the event of SARS-CoV-2 infection. It is recommended to classify them according to the disease (COVID-19), and their personal characteristics. Based on COVID-19, residents are classified as:

- a. Asymptomatic with no close contact with probable or confirmed cases,
  - b. Asymptomatic in preventive isolation due to close contact with probable or confirmed COVID-19,
  - c. With compatible symptoms of COVID-19 and
  - d. Confirmed cases of COVID-19. Depending on personal characteristics, they are classified according to their ability to perform basic activities of daily living (BADLs)\* and instrumental activities of life daily (IADLs)\*\*.
- c) Family Communication Plan, so that residents can maintain bonds and periodic communication with their loved ones in order to make the temporary isolation due to COVID-19 more bearable, via phone calls, video chats, e-mails, written letters.
- d) Management of a dead body in the context of COVID-19. Each center must have a documented protocol for handling infected COVID-19 corpses.

### Interpersonal Distance, Training and Qualification of Work Personnel

Protecting the health and safety of employees must be a priority. Tasks must be planned in such a way that the 2-metre

safety distance established by the health authorities is guaranteed. To this end, Centres were adapted and guidelines were developed for the distribution of spaces and movement of the people, avoiding the overlap in entrances and common areas such as bathrooms, changing rooms and dining halls. Work shifts were organized so that the same employees were always on the same shifts, avoiding exchanges between groups as well as joint activities. A person in charge was assigned on each working group to ensure compliance with the planned preventive measures. All personnel-including new recruits, work leaves, and R&D personnel-received theoretical and practical training in occupational risks, infection control and potential infectious diseases exposure prevention. For the success of the training program it was subsequently supervised and followed on-site.

### Biosafety and Infection Control Measures

The first step in preventing a disease is to understand its etiology. In COVID-19, the preferred route of transmission and the route of exposure are believed to be identical, that is through the respiratory route: from respiratory aerosols (droplets) from an infected person to a susceptible one [2,3]. Recent studies have shown that the SARS-CoV-2 virus is capable of remaining suspended in aerosols for hours [4-6]. However, it is believed that there may also be a spread by direct or indirect contact with contaminated surfaces or objects (fomites) where the virus can remain active for up to several days, depending on the nature of the contaminated surface [7].

Taking this into account, the following measures were adopted:

#### Control of the Entry of the Infectious Agent to the Facilities:

As a general measure, in order to prevent the entry of the infectious agent into the facilities, the access of non-essential visitors and the exits of residents outside the centre were temporarily interrupted. Movement inside the centre was restricted and all socialization activities, group physiotherapy, and non-pharmacological therapies were suspended. The reception of raw materials and supplies was limited, maintaining a space reserved for the reception/return of merchandise, located near the access door and physically or temporarily separated from the rest of areas. With regard to personnel, employees had to go directly to the changing room area and change clothes and shoes.

**Environmental Control of Facilities:** Nursing homes ambient air can constitute a source of contagion for both staff and residents. Controlling this potential pool of infections is increasingly recognized as an important component of infection control and prevention [8]. Natural ventilation by opening doors and windows for as many hours as possible is considered a simple, effective measure to this end. It is recommended to maintain a relative humidity between 40 and 60% in those spaces where the equipment allows it, since the nasal systems and mucous

membranes are more sensitive to infections with humidity below 10-20%. If mechanical ventilation systems are used, it is necessary to avoid the recirculation of the air in the room and to use systems that allow the extraction and renewal of it. Frequent filter cleaning or replacement is recommended.

Regular cleaning and disinfection of equipment and surfaces is extremely important for the environmental pathogens control. To facilitate cleaning and disinfection tasks and reduce as well any equipment or elements that acted as reservoirs, it was recommended to remove all unnecessary decoration utensils, paintings, curtains, furniture made of porous materials difficult to clean, etc. It was recommended to have a documented procedure specifying the type of product, the application method, the contact time, the cleaning frequency, and the responsible personnel for each area of the establishment. These viruses are inactivated after 5 minutes of contact with halogen disinfectants such as hypochlorites. For surfaces that cannot be bleached, 62-71% ethanol or oxidizing agents such as 0.5% hydrogen peroxide can be used.

Special attention should be paid to areas where the contact rates are high and increase the cleaning frequency, especially in those areas of greater contact (knobs, sinks, taps, handles, doors, table surfaces, toilet flush buttons, protection barriers, exits, entrances, stairs, elevators, handrails, armchair supports, wheelchairs, crutches, vending machines, switches, keyboards, etc.). It was recommended to have dispensers with hydroalcoholic solution (with 60-95% alcohol) for hand hygiene, disposable tissues for respiratory hygiene and waste containers with a pedal-operated lid in common areas, work areas, corridors and bedrooms. Bedding and other garments should be washed mechanically with common detergent and in full wash cycles at 60-90°C.

**Quarantines and Isolations:** In order to keep healthy individuals apart from suspicious and / or ill people and limit the spread of viruses within the facilities, the centers were zoned into floors or areas (being vertical or floor isolation a preferable grouping criterion). Centers should be able to have, if necessary, at least the following: a floor or area for asymptomatic residents, with no close contact with positive or confirmed COVID-19 patients; another floor or quarantine area for asymptomatic residents who have had close contact with a possible or confirmed COVID-19 and a final floor or isolation area for confirmed residents. The center can use the fire sectorization already defined as the location area for each of the indicated groups, unless this is not possible due to the size of the Center.

Every one of these areas must be correctly marked and identified with a placard, and both access and transit through them must be limited, with exclusive work personnel assigned for each of them. Footbaths and/or mats impregnated with water and bleach were placed for infection control when changing areas and the mandatory use of clogs. All the equipment to be used for this area must be exclusive for it and must be identified with some striking element, for example by colors. No object should leave the quarantine or isolation area without proper cleaning and disinfection or in sealed bags for proper disposal [9-17].

## Discussion

Of the total of 59 CREs, which accumulate a total number of 3.609 residents, 93 positive residents were registered, belonging to 6 residential centers for the elderly and none belonging to a socio-sanitary center for the disabled. With regard to employees, out of a total of 1.500 there were 38 confirmed positives, all of them from centres that had confirmed positive residents, except for 3 workers who were COVID-19 positive despite working in a centre with no positives registered (Figure 1). Of the residents in Centers for the elderly and other social health centres, there were a total of 149 confirmed positives, 106 in residential centres for the elderly and 43 in other social and health centers. There were a total of 16 deaths due to causes attributable to COVID-19, all of them in RCEs and none in other health centers. 9 of these 16 deaths were within the residential centre, and the other 7 died during their stay in the hospital (Figure 2).

The implementation of the basic principles of biosafety imply the creation of environments in which the care of residents is optimized. It is a priority for Public Health to promote disease-control practices among resident people and employees, as it leads to reducing the risk of exposure to the disease, and therefore the threat posed by COVID-19. It is vitally important to avoid the introduction of the infection in a residential center, since the elderly people are especially vulnerable, they are in close contact with the caregivers, and the isolation of many of them is impossible. The joint work of veterinarians, in the prevention and spread of the disease (COVID-19), and that of doctors, with their commendable care work, focused on the individual, is necessary to achieve the best results in Public Health. The practical implementation of the "One Health" approach, forging professional ties between doctors, veterinarians, nurses and other workers benefit not only the individual, but the entire community, reducing the number of infections and the spread of the disease which could lead to greater number of ill and deceased.

Territorio	Categoría profesional	Confirmados PCR	Fallecidos	Total Confirmados
Andalucía	Sanitario en centro sanitario	2361	8	3615
	Sanitario en centro sociosanitario	596	1	803
	No sanitario en centro sanitario	300	0	451
	No sanitario en centro sociosanitario	315	2	423
Almería	Sanitario en centro sanitario	71	0	130
	Sanitario en centro sociosanitario	17	0	19
Cádiz	No sanitario en centro sanitario	12	0	18
	No sanitario en centro sociosanitario	18	0	19
	Sanitario en centro sanitario	229	2	299
	Sanitario en centro sociosanitario	43	0	67
Córdoba	No sanitario en centro sanitario	22	0	35
	No sanitario en centro sociosanitario	20	1	26
	Sanitario en centro sanitario	206	1	310
	Sanitario en centro sociosanitario	92	0	109
Granada	No sanitario en centro sanitario	34	0	53
	No sanitario en centro sociosanitario	40	0	49
	Sanitario en centro sanitario	459	1	795
	Sanitario en centro sociosanitario	194	0	205
Huelva	No sanitario en centro sanitario	66	0	123
	No sanitario en centro sociosanitario	116	0	127
	Sanitario en centro sanitario	74	0	104
	Sanitario en centro sociosanitario	9	0	12
Jaén	No sanitario en centro sanitario	13	0	17
	No sanitario en centro sociosanitario	6	0	8
	Sanitario en centro sanitario	238	3	396
	Sanitario en centro sociosanitario	78	1	97
Málaga	No sanitario en centro sanitario	41	0	49
	No sanitario en centro sociosanitario	31	0	55
	Sanitario en centro sanitario	602	0	927
	Sanitario en centro sociosanitario	60	0	140
Sevilla	No sanitario en centro sanitario	59	0	80
	No sanitario en centro sociosanitario	43	0	80
	Sanitario en centro sanitario	482	1	654
	Sanitario en centro sociosanitario	103	0	154
	No sanitario en centro sanitario	53	0	76
	No sanitario en centro sociosanitario	41	1	59

Figure 1: Confirmed, cured and deceased cases of COVID 19 in risk professionals according to their profession. Unit of measurement: number of cases. Both genders.

Territorio	Vive en residencia					Otro tipo de institución						
	Confirmado PCR	14 día	Total	Confir	Curados	Fallecidos	Confirmado PCR	14 día	Total	Confir	Curados	Fallecidos
Andalucía	2062	1	2697	2090	558	429	3	587	475	29		
Almería	99	0	106	90	16	14	1	47	46	0		
Cádiz	245	0	303	223	78	23	0	23	20	0		
Córdoba	318	0	375	307	68	28	0	32	30	2		
Granada	401	0	520	396	122	91	0	121	116	5		
Huelva	29	0	39	31	8	9	0	9	6	3		
Jaén	249	0	343	283	60	74	0	98	92	6		
Málaga	176	1	380	278	58	140	2	182	91	13		
Sevilla	544	0	630	482	148	49	0	74	74	0		

Figure 2: Confirmed cases, deceased and cured by COVID 19 in populati on living in residences according to sex by province. Unit of measurement: number of cases. Both genders

### Acknowledgments

The authors would like to thank for the professionalism, dedication and sacrifice the personnel of these centres has shown in the care of the most fragile and vulnerable, without whom none

of this would have been possible.

### Competing Interests

None declared.

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ISSN: 2574-1241

DOI: 10.26717/BJSTR.2021.35.005661

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