

# The Effect of the COVID-19 Pandemic on Health Service Accessibility for Children under 5 in the Mayo-Tsanaga and Logone & Chari Departments, Far North Cameroon

Ulrich Dama<sup>1,2</sup>, Desire Tchoffo<sup>2,3</sup>, Jean Ndibi Abanda<sup>2,3</sup>, François Anicet Onana Akoa<sup>2</sup>, Alphonse Tedonge Asobochia<sup>2,4</sup>, Melkior Fobasso Dzeuta<sup>2,3</sup>, Aureol-Le-Rocher Ngako Njiacheu<sup>5</sup>, Pierre Yassa Yoniene<sup>6</sup>

<sup>1</sup>World Health Organization, Maroua, Cameroon

<sup>2</sup>Faculty of Health Sciences, University of Lisala (CIREP-UNILIS), Lisala, The Democratic Republic of the Congo

<sup>3</sup>National Order of Medical and Sanitary Professions, Yaounde, Cameroon

<sup>4</sup>Faculty of Medicine, University of Bamenda, Bamenda, Cameroon

<sup>5</sup>Faculty of Health Sciences, Catholic University of Central Africa, Yaounde, Cameroon

<sup>6</sup>Faculty of Medicine, University Simon Kimbangu, Kinshasa, The Democratic Republic of the Congo

Email: dama.ulrich@gmail.com

**How to cite this paper:** Dama, U., Tchoffo, D., Ndibi Abanda, J., Akoa, F.A.O., Asobochia, A.T., Dzeuta, M.F., Njiacheu, A.-L.-R.N. and Yoniene, P.Y. (2023) The Effect of the COVID-19 Pandemic on Health Service Accessibility for Children under 5 in the Mayo-Tsanaga and Logone & Chari Departments, Far North Cameroon. *Health*, 15, 1047-1058.

<https://doi.org/10.4236/health.2023.1510071>

**Received:** September 5, 2023

**Accepted:** October 7, 2023

**Published:** October 10, 2023

Copyright © 2023 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Context/objectives:** The COVID-19 pandemic has disrupted all programs, potentially impacting access to health services for children under 5 years old. The Far North of Cameroon is one of the northern regions with a prevalence of malnourished children ranging from 5% to 10%. Due to the barrier measures implemented to combat the pandemic, many parents are reluctant to take their children to healthcare facilities. Some of these children were benefiting from the Ambulatory Care Center (ACC) program prior to the COVID-19 outbreak. The main objective of this research is to assess the impact of COVID-19 on access to health services for children under 5 in the Mayo Tsanaga (MT) and Logone & Chari (LC) departments. The implementation of barrier measures could significantly increase the risk of malnutrition among children under 5 years old. **Method:** A cross-sectional analytical study was conducted in the MT and LC departments, employing both retrospective and prospective approaches. Data was collected through questionnaire, interview guide and a review of existing data prior to the pandemic (DHIS 2). Kobo Collect software was used for data collection, and R software was used for analysis. **Results:** Children who benefitted from the ACC program during the COVID-19 period were found to have a lower prevalence of malnutrition compared to those who did not benefit (OR: 0.09, CI {0.0 - 0.44}). **Conclusion:** COVID-19

has led to a decrease in the utilization of health facilities in both departments of the study, resulting in an increase in health issues such as malnutrition among children under 5 years old. Various policies have been implemented to improve attendance at health facilities.

## **Keywords**

COVID-19, Impact, Health, Child under 5, Far North, Cameroon

---

## **1. Context and Objectives**

The COVID-19 disease is caused by a novel strain of coronavirus that belongs to the same family as other viruses, such as severe acute respiratory syndrome (SARS) and certain types of colds [1]. The COVID-19 pandemic has had a significant impact on the accessibility and delivery of healthcare services in numerous countries [2]. To limit the spread of the virus, many clinics and hospitals have been compelled to reduce their services or temporarily close. Patients have also been discouraged from visiting healthcare facilities for routine or non-emergency consultations due to the risks of virus transmission [3]. However, many healthcare professionals have remained dedicated to providing essential care to patients with COVID-19 and other severe illnesses. Telemedicine services have also been introduced to enable patients to consult medical doctors and nurses remotely, thus ensuring continued access to care in certain regions [4]. In the departments of Mayo Tsanaga and Logone & Chari, Far North region of Cameroon where our study was conducted, no previous study has been conducted to evaluate the impact of this pandemic on the health of children. Therefore, our objective is to evaluate the impact of the pandemic on the access to health services for children under five years in these two divisions.

## **2. Methods**

### **2.1. Study Design**

We have conducted a cross-sectional analytical study among 249 parents residing in the Mayo-Tsanaga and Logone & Chari division, the Far North region of Cameroon. The study population consisted of parents with at least one child under the age of five years. During the data collection period from April to June 2022, households hosting at least one child aged 0 to 59 months in the study sites and who agreed to participate were included. Contrary to parents whose consents were not obtained, who did not reside in one of the divisions, or who refused to participate. Data have been collected through a questionnaire and an interview guide.

### **2.2. Sampling**

The sample size has been obtained by Lorentz formula

$$n = t^2 \times p \times (1 - p) / m^2 \quad [5]$$

“*t*” (confidence level), “*p*” (estimated proportion), and “*m*” (margin of error). 246 children under five years old was finally retained for the study. Giving the fact that there are 12 health districts in the Mayo-Tsanaga and Logone & Chari divisions, we surveyed 21 children in each of them, resulting in a total sample size of 252.

### 2.3. Statistical Methods

The questionnaire was edited in Excel and imported into Kobo Collect/ODK Collect, and then used for digital data collection on an Android phone. During data collection, a selection bias was identified, with three children aged 60 months mistakenly included in the study. These respondents were removed from the dataset, resulting in a sample size of 249 with usable data. Socioeconomic and demographic characteristics of parents were described, and data on access to health services in the context of COVID-19 was collected.

Data collection authorizations were obtained from the regional public health delegation of the Far North as well as the various health districts involved in the study.

## 3. Results

### 3.1. Characteristics of the Children Interviewed

Regarding the characteristics of the children interviewed (**Table 1**), it was observed that the median age was 39 months, with an interquartile range of 26 to 46 months. In our sample, 25% of the children were at least 26 months old, while 75% were aged at most 46 months at the time of the survey. The most represented age group was children aged 36 - 47 months, accounting for 39% of the sample, followed by children aged 48 - 59 months at 22.5%, and children aged 24 - 35 months at 22.1%.

In terms of height, the median height of the children interviewed was 85 cm, ranging from 76 cm to 96 cm. **Table 1** below presents the central tendency parameters of the surveyed children. Regarding gender, 50.2% of the children were girls and 49.8% were boys, resulting in a male/female sex ratio of 0.992.

#### Sex Ratio by Age Group

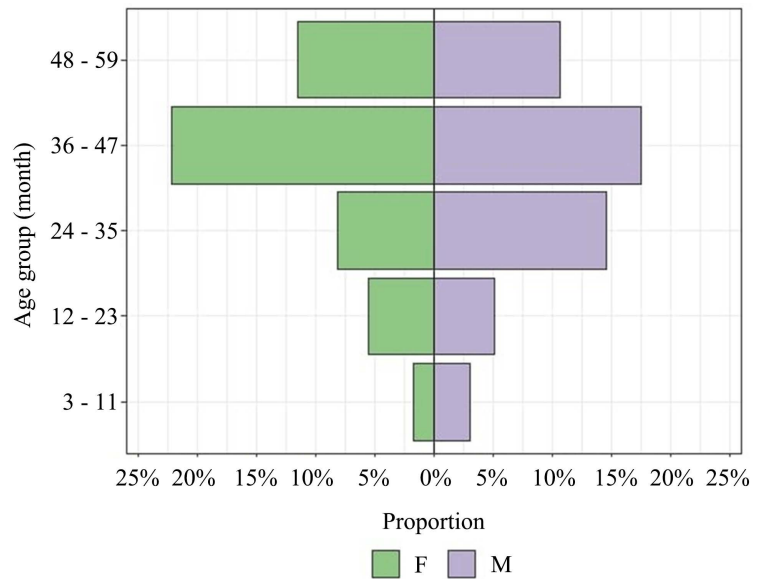
**Table 2** below shows the ratio by age group.

#### Age and sex of the children interviewed

The 36 - 47-month age group was the most represented in our study population and was mainly made up of girls (**Figure 1**).

### 3.2. Characteristics of Parents Surveyed

In **Table 3** below, it is evident that 76% of the parents are married, 20% are single, and 3.2% are divorced. In terms of education level, it is evident that 63% of parents have no formal education, 23% have completed primary education,



**Figure 1.** Proportion of age and sex of the children interviewed.

**Table 1.** Characteristics of children interviewed.

Characteristics	N = 249 <sup>1</sup>
<b>Child's gender</b>	
Female	125 (50%)
Male	124 (50%)
<b>Child's age in months</b>	
Median (EI)	38 (26 - 46)
Mean (ET)	35 (14)
Range	3, 59
<b>Child size</b>	
Median (EI)	85 (76 - 93)
Mean (ET)	85 (13)
Range	54, 120
<b>Child's weight</b>	
Median (EI)	12.00 (11.00 - 14.00)
Mean (ET)	12.62 (2.94)
Range	6.00 - 28.00
<b>Upper arm circumference</b>	
Median (EI)	139 (129 - 149)
Mean (ET)	141 (16)
Range	99 - 188

<sup>1</sup>n (%).

**Table 2.** Sex ratio by age group.

Age group	Ratio (M/F)
3 - 11	1.286
12 - 23	0.923
24 - 35	1.750
36 - 47	0.796
48 - 59	0.806

**Table 3.** Characteristics of parents interviewed.

Characteristics	N = 249 <sup>1</sup>
<b>Matrimonial status</b>	
Single	49 (20%)
Free	3 (1.2%)
Married	189 (76%)
Divorce	8 (3.2%)
<b>Educational level</b>	
No level	156 (63%)
Primary	58 (23%)
Secondary	31 (12%)
University	4 (1.6%)
<b>Residence</b>	
Slum	3 (1.2%)
Rural	239 (96%)
Urban	7 (2.8%)
<b>Number of children under 5 in the household</b>	
Median (EI)	2.00 (2.00 - 3.00)
Mean (ET)	2.53 (1.39)
Range	1.00 - 11.00

<sup>1</sup>n (%).

and only 2% of parents have attained a university level of education. Furthermore, 96% of parents reside in rural areas, and 25% of parents have fewer than two children in their household.

### 3.3. Access to Health Services before COVID-19

It was found that 25% of parents sought health care twice a year (**Table 4**). This indicates that some parents use health services relatively infrequently.

**Table 4.** Access to health service before COVID-19.

Characteristics	N = 249 <sup>1</sup>
<b>How often do you seek care in pre-COVID-19 health services per year?</b>	
Median (EI)	3 (2 - 5)
Mean (ET)	9 (16)
Range	0, 79
<b>Are you eligible for the ACC program?</b>	
No	148 (59%)
Not applicable	6 (2.4%)
Yes	95 (38%)

<sup>1</sup>n (%).

In contrast, 75% of parents sought health care at least five times a year. This suggests that most parents use health services regularly, possibly due to more frequent health needs or specific medical conditions.

Regarding children, prior to COVID-19, it was noted that 38% of them had benefitted from a program that provided adapted health care.

These results highlight the significance of access to health services for both parents and children, as well as the potential impact of the COVID-19 pandemic on this access. It would be interesting to continue the study to assess the changes in access to care during and after the pandemic.

In terms of the period before COVID-19, 25% of parents sought health care twice a year, while 75% sought it at least five times a year. Additionally, 38% of children benefitted from the Ambulatory Care Center (ACC) program prior to the pandemic.

### 3.4. Access to Health Services during COVID-19

In terms of access to health services during the COVID-19 period, the following results were observed:

In **Table 5** below, it was found that 25% of the surveyed children fell ill twice between 2020 and 2022. This indicates that some children experienced relatively infrequent episodes of illness during this period.

In contrast, 75% of the surveyed children fell ill at least four times during the same period. This suggests that most children experienced more frequent episodes of illness, potentially due to factors such as the prevalence of COVID-19 or other infections.

Regarding access to healthcare, it was found that 37% of the surveyed children benefitted from the ACC program, which provided them with appropriate health-care during the pandemic.

**Table 5.** Access to Health services during COVID-19.

Characteristics	N = 249 <sup>1</sup>
<b>How many times did the child fall ill in the years 2020-2022?</b>	
Median (EI)	3.0 (2.0 - 4.0)
Mean (ET)	4.3 (4.6)
Range	0.0 - 41.0
<b>How often do you seek care in health services during the COVID-19 period per year?</b>	
Median (EI)	3 (2 - 4)
Mean (ET)	7 (16)
Range	0. 76
<b>Do you benefit from the ACC program?</b>	
No	157 (63%)
Yes	92 (37%)
<b>Has the quality of health services provided during COVID-19 in health facilities been affected?</b>	
Improved	98 (39%)
Lowered	79 (32%)
Unchanged	72 (29%)
<b>If a child under 2 years old, does he keep his vaccination appointments?</b>	
No	34 (14%)
Yes	215 (86%)
<b>If yes, what is the last vaccine that the child took?</b>	
Contact 2	5 (2.3%)
Contact 4	18 (8.4%)
Contact 6	115 (53%)
Contact 3	10 (4.7%)
Contact 5	67 (31%)

<sup>1</sup>n (%).

Furthermore, it was noted that 39% of parents believed that the quality of health services provided in healthcare facilities during the COVID-19 pandemic had improved. This suggests a positive perception of the improvement in health services in the context of the pandemic.

### 3.5. Access to Health Services during COVID-19 and Risk of Malnutrition

During COVID-19 represented in **Table 6**, our results show that the sicker a

**Table 6.** Multiple regression of data during COVID-19.

Characteristic	N	OR1	95% CI <sup>1</sup>	p-value
<b>How many times did the child fall ill in the years 2020-2022?</b>	249	1.04	0.97 - 1.11	0.2
<b>How often do you seek care in health services during the COVID-19 period per year?</b>	249	0.98	0.94 - 1.01	0.4
<b>Do you benefit from the ACC program?</b>	249			
No		-	-	
Yes		0.39	0.14 - 0.93	0.046
<b>Has the quality of health service provided during COVID-19 in health facilities:</b>	249			
Improved		-	-	
Down		2.75	1.01 - 8.23	0.054
Unchanged		3.07	1.13 - 9.22	0.033
<b>If a child under 2 years old, does he follow his vaccination appointments?</b>	249			
No		-	-	
Yes		1.03	0.37 - 3.68	>0.9

<sup>1</sup>OR = Odd Ratio, CI = confidence interval.

child becomes, the higher the risk of malnutrition (OR = 1.04, 95% CI [0.97 - 1.11]); in terms of the frequency of seeking care, it is noted that the more the frequency of seeking care increases, the less malnourished children are (OR = 0.98 CI 95% [0.94 - 1.01]). For the ACC program, children who benefit from this program are 0.39 times less likely to be malnourished compared to children who do not benefit from this program (OR = 0.39, 95% CI [0.14 - 0.93] and the difference between the two categories is significant at the 5% threshold (p-value = 0.0460). Regarding the quality of health service provided during COVID-19, children whose quality of service remains unchanged are 3.07 times more likely to be malnourished compared to children whose quality of services has improved with the COVID-19 pandemic (OR = 3.07, 95% CI [1.13 - 9.22]) and the difference between these two categories is significant at the 5% level (p-value = 0.033).

#### 4. Discussion

Regarding the first finding that 25% of parents only use health care services twice a year, this suggests that there is a segment of the population that has less frequent utilization of health services. Several factors may contribute to this, such as overall health, limited access to services, or personal preferences, economical determinants.



In contrast, it is noteworthy that 75% of parents use health services at least five times a year, indicating more regular utilization. There can be various reasons for this, including more frequent health needs or specific medical conditions that require regular monitoring. The economic crisis resulting from the COVID-19 pandemic has had a significant impact on the financial resources of families. This can create difficulties for children in accessing health services, particularly for economically vulnerable families.

Regarding children, there appears to be a slight decrease in attendance at health facilities during the COVID-19 pandemic, with the number of beneficiaries of the ACC program dropping from 38% to 37%. This decline can be attributed to containment measures and concerns related to the pandemic such as rumors surrounding the disease, which may have deterred some families from seeking healthcare for their children.

Finally, it is encouraging to note that 39% of parents believe that the quality of health services provided during COVID-19 has improved. This suggests that despite the challenges posed by the pandemic, some health facilities have been able to adapt and offer better-quality services. It is important to continue monitoring and improving health services specifically and health system in general to meet the needs of the population, especially in exceptional situations like COVID-19. These findings are supported by the comments of some parents, none of whom responded as follows: parent 1: *“It’s difficult because we don’t want people to be in close proximity, motorcycle taxis refuse to transport us”*; parent 2: *“It’s difficult because I’m afraid of dying”*; parent 3: *“It’s a little difficult because everyone is afraid of the disease”*; and parent 4: *“It’s not easy, it’s stressful, and there are no resources.”*

In some localities, parents explain the decrease in attendance at health facilities for several reasons.

Parent 1 mentions: *“There’s poor reception because if you come with a child who is convulsing, for example, they first ask you to wash your hands before inquiring about the child’s condition”*.

Parent 2 states: *“The staff is overloaded, and there are many requirements to be fulfilled before being attended to, such as having a muffler on your motorcycle.”*

Parent 3: *“the staff is very suspicious.”*

Parent 4: *“the poor suffer because there is a lot to do before they are consulted.”*

In line with our study, Ousmane Ndiaye *et al.*, whose study aimed to assess the impact of COVID-19 on the care activities and revenues of the Albert Royer National Children’s Hospital Center in Dakar, Senegal, have reached similar conclusions. The results of their study revealed an average decrease of 33% in outpatient consultations during the first quarter of 2020, a period marked by the pandemic, compared to the first quarter of 2019. This significant decline signifies the negative impact of COVID-19 on access to medical care in this region [6].

Similarly, Saskia Osendarp's study on "The COVID-19 crisis will exacerbate maternal and child undernutrition and child mortality in low- and middle-income countries" aimed to provide a multi-year perspective on the potential consequences of the pandemic-induced health and food systems economic crisis on maternal and child nutrition in 118 low- and middle-income countries, as well as the cost of interventions to mitigate these impacts [7]. This study highlights the challenges of measuring the effects of COVID-19 disruptions on the delivery of essential health and nutrition interventions, but several efforts led by organizations are producing promising results. World Bank surveys have also revealed that in four African countries, many households were unable to access medical care during the pandemic due to fear of contracting the virus or government restrictions on travel and social distancing [8].

UNICEF also reports an overall decrease of 30% in the coverage of essential nutrition services, such as school feeding, micronutrient supplementation, nutrition promotion programs, as well as programs for the treatment of severe wasting in children [9].

The COVID-19 pandemic has had a significant impact on access to health services in many countries. To limit the spread of the virus, many clinics and hospitals have had to reduce their services or temporarily close. This has discouraged patients from seeking routine care or non-emergency consultations at healthcare facilities. However, medical professionals have been working diligently to provide essential care for patients with COVID-19 and other serious illnesses. Additionally, telemedicine has emerged to allow patients to consult with doctors and nurses remotely, ensuring continued access to care in certain regions.

Despite these efforts, the pandemic has significantly hindered access to healthcare, particularly in areas heavily affected by the virus. It is crucial to continue working towards restoring access to healthcare and providing comprehensive services with maximum safety for both patients and healthcare professionals.

Several theories can help explain this decline:

- The fear of contamination theory [10]: The rapid spread of COVID-19 has resulted in a decrease in healthcare utilization for children under 5. Parents' fear of exposing their children to the virus when visiting healthcare facilities is a key factor contributing to this decline in access to care. Providing clear, reassuring, and evidence-based information is essential in encouraging parents to maintain regular medical care for their children.
- Travel restrictions [11]: Confinement measures and travel restrictions implemented to control the spread of COVID-19 may prevent parents from taking their children to medical appointments or vaccination centers.
- Disruption of health services [12]: The COVID-19 pandemic has disrupted healthcare systems in many countries. Health facilities may have been redirected or repurposed to address COVID-19 cases, resulting in reduced healthcare services for children.

These findings underscore the significance of access to healthcare services for parents and children and the potential impact of the COVID-19 pandemic on this access. Further research to assess the evolution of access to care during and after the pandemic would be valuable.

## 5. Conclusion

This study emphasizes the adverse effects of the pandemic on the availability of healthcare services. Parents encountered challenges in accessing health centers due to travel restrictions and concerns about contracting the virus. Consequently, there was a decline in attendance at follow-up appointments and nutrition programs, resulting in negative repercussions for children's health.

## Acknowledgements

We acknowledge the University of Lisala, for all the support provided to implement this project.

We also express gratitude to the schools for giving us access to investigate on their premises and to all the participants who took part in this study.

## Compliance with Ethical Standards

We obtained authorization to collect data from the regional public health delegation of the Far North

## Conflicts of Interest

All authors declared no competing interest and we received no funding to realize this study.

## Authors' Contributions

Ulrich DAMA, Pierre YASSA YONIENE, Desire TCHOFFO, Jean NDIBI ABANDA, François Anicet ONANA AKOA, Melkior Fobasso DZEUTA, Alphonse TEDONGE ASOBOCHIA and Aureol-le-Rocher Ngako Njiacheu designed the study. Ulrich DAMA, Desire TCHOFFO and Pierre YASSA YONIENE analyzed the data and produced the first draft of the study. All authors extracted the manuscript and approved the final draft.

## References

- [1] Questions-réponses sur la COVID-19. <https://www.who.int/fr/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub>
- [2] (2021) Face aux conséquences de la COVID-19 sur l'éducation, il faut agir vite et efficacement. <https://www.banquemondiale.org/fr/news/immersive-story/2021/01/22/urgent-effective-action-required-to-quell-the-impact-of-covid-19-on-education-worldwide>
- [3] OECD (2020) L'Impact territorial du COVID-19: Gérer la crise entre niveaux de gouvernement.

- <https://www.oecd.org/coronavirus/policy-responses/l-impact-territorial-du-COVID-19-gerer-la-crise-entre-niveaux-de-gouvernement-2596466b/>
- [4] Rey-Arles, S. (2020) Chapitre 20. La télémédecine pendant la crise de la COVID-19: un changement de paradigme éphémère ou pérenne? <https://www.cairn.info/l-hopital-pendant-la-COVID-19-innovations--9782376873891-page-359.htm>
- [5] Dama, U., Socpa, A. and Nsoh, M. (2021) Cultural and Behavioral Factors Related with Non-compliance to Hygienic Rules by Food Vendors in Primary and Secondary School in the Benoue Division—Cameroon. *Journal of Medical Research and Health Sciences*, **4**, 1285-1290.
- [6] Ndiaye, O., Fall, F.T., Faye, P.M., Thiongane, A. and Fall, A.L. (2020) Impact de la pandémie à COVID-19 sur les activités du Service de Pédiatrie du Centre Hospitalier National d'Enfants Albert Royer: étude préliminaire comparant les premiers trimestres des années 2019 et 2020. *Pan African Medical Journal*, **36**, Article No. 162. <https://doi.org/10.11604/pamj.2020.36.162.23629>
- [7] Osendarp, S., Akuoku, J.K., Black, R.E., Headey, D., Ruel, M., Scott, N., *et al.* (2021) The COVID-19 Crisis Will Exacerbate Maternal and Child Undernutrition and Child Mortality in Low- and Middle-Income Countries. *Nature Food*, **2**, 476-484. <https://doi.org/10.1038/s43016-021-00319-4>
- [8] Walker, D., Krubiner, C. and Chi, Y-L. (2021) What Do We Really Know About COVID-19's Impact on Essential Health Services? <https://www.cgdev.org/blog/what-do-we-really-know-about-COVID-19s-impact-essential-health-services>
- [9] (2021) Nutrition Crisis Looms as More Than 39 Billion in-School Meals Missed Since Start of Pandemic—UNICEF and WFP. <https://www.unicef.org/press-releases/nutrition-crisis-looms-more-39-billion-school-meals-missed-start-pandemic-unicef-and>
- [10] Lavenne-Collot, N., Ailliot, P., Badic, S., Favé, A., François, G., Saint-André, S., *et al.* (2021) Les enfants suivis en psychiatrie infanto-juvénile ont-ils connu la dégradation redoutée pendant la période de confinement liée à la pandémie COVID-19? *Neuropsychiatrie de l'Enfance et de l'Adolescence*, **69**, 121-131. <https://doi.org/10.1016/j.neurenf.2021.02.006>
- [11] La Convention relative aux droits de l'enfant—Version pour les enfants. <https://www.unicef.org/fr/convention-droits-enfant/convention-droits-version-enfants>
- [12] Rodriguez-Leyva, D. and Pierce, G.N. (2021) The Impact of Nutrition on the COVID-19 Pandemic and the Impact of the COVID-19 Pandemic on Nutrition. *Nutrients*, **13**, Article No. 1752. <https://doi.org/10.3390/nu13061752>