How to Evaluate Viral Transmission in Enclosed Areas. Medical Geology saving places from Covid-19

*CRUZ-RODRIGUEZ L[1,2,3], SANCHEZ BATISTA L[4], HOCHWIMMER B[5], TAIBI BEN HADDA[6,7], ALMALKI F.A.[7], DILSIZ N.[8], CAPARROS J.L.[1], LAMBERT BROWN D.[9], ZIARATI P.[10], ZAYAS TAMAYO A.M.[4], PELAEZ FIGUEROA Y[2], HERRERA SANCHEZ M.B.[11], GARCIA HERNANDEZ A[12], BIN ZHAO[13]

[1]CEO, ELIDAN genome SAS, 1 avenue du Lycée, 77130 Montereau Fault Yonne, France.

[2]CEO, ELIDAN Dynamic LLC, 1602 Windermere Way, Tampa, FL,33619, USA.

[3]ExCELab Co. Ltd., Manager Director of Environmental Biotechnology Department, Jamaica.

[4]ExCELab Co. Ltd., Environmental Biotechnology Department, Jamaica.

[5]CEO, Hochwimmer B. & Asso. Pty Ltd: Consultants in Exploration, Mining and Environmental Geology, NSW, Australia.

[6]Laboratory of Applied Chemistry & Environment, Faculty of Sciences, University Mohammed the first, BP 524, 60000, Oujda, Morocco.

[7]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Umm Al-Qura University, Makkah Almukkarramah-21955, Saudi Arabia.

[8]Molecular Biology and Genetics, Faculty of Engineering and Natural Sciences, Istanbul Medeniyet University, Istanbul, Turkey.

[9]CEO, Family Physician, FCMC & ExCELab Co. Ltd, Jamaica.

[10]Head of Nutrition and Food Sciences Research Center, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran.

[11]2i3T-Società per la gestione dell'incubatore di imprese e per il trasferimento tecnologico dell'Università degli studi di Torino, Scarl and Molecular Biotechnology Center (MBC) Via Nizza, 52, 10126 Torino, Italy

[12]CEO, DSAtrading Co, Parque tecnológico de Málaga, Spain

[13]School of Science, Hubei University of Technology, Wuhan, Hubei, China.

*Correspondence author
Prof. Dr. CRUZ-RODRIGUEZ Luis
CEO,
ELIDAN genome SAS
1 avenue du Lycée
77130 Montereau Fault Yonne
France
ORCID : https://orcid.org/0000-0002-7539-2382

Email : lcr@elidan-genome.com,
         luis.cruzrguez@gmail.com

Submitted : 15 Jun 2020 ; Published : 28 Jun 2020

Abstract

The new coronavirus, formed a clade within the subgenus Orthocoronavirinae, sarbecovirus subfamily. The first time these cases were published they were classified as "pneumonia of unknown etiology." The Chinese Center for Disease Control and Prevention (CDC) and local CDCs organized an intensive outbreak investigation program. The etiology of this illness is now attributed to a novel virus belonging to the coronavirus (CoV) family, Covid-19. The pandemic caused by a novel virus strain Covid-19, approaches 7,734,000 cases with 429,000 fatalities in 215 countries worldwide. Moreover, a solid second wave in some countries, in cases exceeding the first, ensures that from the clinical range details of the

disease, new diagnostics, prevention and treatment strategies remain in the process of development. Unfortunately, for future epidemics insufficient research leading up to purported species-species viral transmission (VT) is disastrous. What we know is VT are more frequently episodic, yet always assume a systemic closed biology. However, this may be a faulty discipline assumption since the increasing episodic nature of viral transmission bears scrutiny on potential physiographic-climactic links. These in turn are open to geological-geogenic connections with regards to terrain biology and ecology. The entire biological cycle of the virus and host, together with the evolution of the epidemic, (most specifically identifying when the epidemic will reach its peak), is unknown, as are repositories of the next epidemic strains, or to such links. The entire environmental etiology of the CoV family is unsettled. Terrain-controlled genomic studies in soil geo-microbiology plus invertebrate Medical Geology for higher species-species transmissions studies are recommended. This may extend the viral genomic phylogenetic trees beyond the species-species barriers and provide diversity of potential future impacts. Geologists have not yet considered the possibility of this virus spreading by air, water, and earth. The discipline of Medical Geology can translate this enigmatic situation using its potential to understand the planet and human-animal (health) relationships. One aim of this type of study is to better understand potential 'dormant genomic' repositories of outbreaks, susceptible to such triggers and potential spread of those repositories, together with potential geogenic terrain factors like closed space and triggers. The question then: are future epidemic risks amenable to forecast from identifiable triggers? Of immediate concern, integrated research on closed spaces favorable or not to virus transmission subject to certification. We are opening diversity research in viral Medical Geology studies, as a new discipline. Currently, there appears to be an urgent need for society to be educated on how to exist in a world with the Covid-19 virus whilst simultaneously preventing the spread of the pandemic. However, it is obviously not enough to impose physical distancing among people, isolation of patients, coughing "vampire" style into your elbow or continuing the usage of hand disinfectants and hand washing. The goal of this most recent work is to present the values of VT (ie: viral transmission) as a reference for individuals (VTi) as well as for closed spaces where people will be present (VTcs). We have presented a unique mathematical model, which is unprecedented. It analyzes four key parameters in the propagation of Covid-19. The VTi in selected enclosed spaces (VTcs) was calculated according to the mathematical algorithm proposed by Prof. Dr. Luis CRUZ RODRIGUEZ. The Covid-19 pandemic led to not only the public health crisis but also combined with a global recession in the world. Here we have proposed a Certificate of prolonged safety in enclosed areas such as in buildings or with modes of transportation: Control of the viral transmission of Covid-19. Our aim of this is to better understand potential dormant repositories of outbreaks and potential spread of those repositories, together with potential geological-geogenic terrain factors in closed space and their triggers. Integrated research on closed spaces favorable or not to virus transmission subject to certification along with opening diversity research in viral Medical Geology studies, as a new discipline is anticipated.

Keywords: Covid-19, Viral Transmission (VT), Certificate, Medical Geology, Closed Space

Introduction

The new coronavirus, formed a clade within the subgenus Orthocoronavirinae, sarbecovirus subfamily. The first time these cases were published they were classified as "pneumonia of unknown etiology." The Chinese Center for Disease Control and Prevention (CDC) and local CDCs organized an intensive outbreak investigation program. The etiology of this illness is now attributed to a novel virus belonging to the coronavirus (CoV) family, namely Covid-19. The genus Betacoronavirus SARS-CoV-2 is a spherical particle, ranging from 30 nm to 100 nm in diameter and seventh member of the Coronaviridae family (229E, OC43, NL63, HKU1, SARS-CoV and MERS-CoV with a genomic similarity of 79.6%) [1-4].

January 10, 2020, the first 2019-nCov genome was sequenced, followed by five subsequent viral genome sequences [5]. According to the World Health Organization (WHO), viral diseases continue to emerge episodically and represent a serious issue to public health. In the last twenty years, several viral epidemics such as the severe acute respiratory syndrome coronavirus (SARS-CoV from 2002 to 2003, and H1N1 influenza in 2009), are just two examples which have been recorded. In December 2019, a cluster of patients with pneumonia of unknown cause was linked to a seafood wholesale market in Wuhan, China. A previously unknown betacoronavirus was identified through the use of unbiased sequencing in samples from patients with pneumonia [6].

The pandemic caused by the novel virus strain Covid-19, has led to over 7,734,000 cases with 429,000 fatalities in 215 countries worldwide. The clinical range of the disease, new diagnostics, prevention and treatment strategies are in the process of development.

Unfortunately, insufficient research leading up to purported species-to-species viral transmission (VT) is causing dismay to those interested in the disease. We know that VT are more frequently episodic, yet always assume a systemic closed biology. This may be a faulty discipline assumption since the increasing episodic nature of viral transmission bears scrutiny on potential physiographic-climactic links. These in turn are open to geogenic-geological connections with terrain biology and ecology.

The entire biological cycle of the virus and host along with the evolution of the epidemic, (most especially identifying when the epidemic will reach its peak) is unknown. Terrain-controlled genomic studies in soil geo-microbiology along with invertebrate Medical Geology to higher species-species

transmissions studies are recommended. This may extend the viral genomic phylogenetic trees beyond the species-species barriers and provide diversity of potential future impacts. Geologists have not considered the possibility of the disease spreading by air, water, and earth. The discipline of Medical Geology can translate this enigmatic situation using its potential to understand the planet and human (health) relationships [7-9].

One aim of this proposed study is to better understand potential dormant repositories of outbreaks and the potential spread of those repositories, together with potential geogenic terrain factors like closed spaces and triggers. Integrated research to certificate the closed space may be favorable or not, regarding virus transmission. We are opening diversity research in viral Medical Geology studies, as a new discipline [10-12].

Covid-19 is an infectious disease whose course of propagation makes it difficult to estimate. Epidemiologist Adam Kucharski has explained the factors which play an important role in the transmission of the disease through mathematical models utilizing human Coronavirus as the source of Viral Transmission (VT), and identified in his research four parameters of contagion of this illness. His work concludes that the propagation period for the sickness requires less time than what's needed for the development of an efficacious vaccine against Covid-19 [12-15].

Kucharski has experience conducting research for a variety of diseases including Ebola, SARS and influenza, and now Covid-19. In his book The Rules of Contagion: Why Things Spread - and Why They Stop, he touches upon the rules of contagion: the "how" and the "why" of viruses' spread along their eventual cessation. Researchers [16].

Jinming Cao and co have developed a mathematical algorithm to understand the coexistence of Covid-19 corresponding with routine activities in society [17].

At present, it is apparent that society will need ongoing education to coexist with the Covid-19 virus while simultaneously learning how to prevent the spread of this pandemic. Sadly, it seems these measures are not enough anymore: imposing physical distancing, isolation of patients, coughing "vampire" style into your elbow or the utilization of hand disinfectant or good hand-washing hygiene.

The goal of this present work is to present values of VT (viral transmission) as a reference for individuals (VTi) as well as for closed spaces where people will be present (VTcs). We have presented a unique mathematical model, unprecedented to date, which analyzes four key parameters in the propagation of Covid-19. We have named these parameters: A, B, C and D, by which: A: coefficient of viral acquisition, B: viral latency, C: coefficient of viral emission, D: constant of viral reproduction. These parameters are thus named A, B, C and D, whereby: Parameters: A, B and C are associated with physiological parameters intrinsic to the individual such as: age, sex, height,

body weight, glycemic levels, cholesterol levels, hemoglobin levels and glycated hemoglobin levels. Parameter D stands for the constant of Covid-19 viral reproduction.

The Robert Koch German Institute of Virology assumes that the basic rate of reproduction (D) of SARS-CoV-2 is between 2.4 and 3.3, for the purpose of our working model, we have set its value at D=3.3, which is from the higher end (it's the highest possible value); it was selected so as not to underestimate real values in the population study of VTi.

The VTi in selected enclosed spaces (VTcs) was calculated according to the mathematical algorithm proposed by Prof. Luis CRUZ RODRIGUEZ.

Here we have proposed a Certificate (Annexes) of prolonged safety within enclosed areas such as buildings and modes of transportation: Control of the viral transmission of Covid-19 [17].

Methods and Materials

To develop the objectives set forth, we propose the following working hypotheses:
If parameters: A, B and C fall within the normal physiological range Then, viral transmission will fall its lowest value, corresponding to the viral reproduction rate: VTi =D.

If parameters: A, B and C fall outside the normal physiological range Then, viral transmission will reach the highest end of the value of the constant reproduction rate: VTi >D.

a)   Individual Viral Transmission: VTi

The equation is defined by the following mathematical algorithm developed by Prof. Luis CRUZ RODRIGUEZ in collaboration with his colleague Lenier Sánchez Batista.

$$VT_i = D\left[100001\, e^{\left[\frac{(V-9841)^2}{8(10^8)}\right]} - 100000\right]$$

VTi Unit: San (The unit of measurement San has been assigned by Prof. Luis CRUZ RODRIGUEZ in acknowledgment of the collaboration by Lenier Sánchez Batista in the development of this algorithm.

b)   Data Vector: V

V, is composed by the vectorial arrangement of parameters A, B, C. These parameters (Table 1) have been grouped in the vector V = [B C A]

Parameters	Age	Hemoglobin (Hb)	Sex	Glycated Hb	Cholesterol	Glycemia	Body Weight	Height
A	*	*	*					
B			*	*	*	*		
C					*	*	*	*

Table 1: A= (age, Hb, sex); B= (cholesterol, glycemia, Hb/glycated Hb); C= (glycemia, body weight, height)

Where:

V= [B   C   A   ]

V = [(cholesterol, glycemia, Hb/glycated Hb) (glycemia, body weight, height) (age, Hb, sex)]

The relationship among individuals respecting the coefficient of individual viral transmission of Covid-19 is shown in Figure 1 below.
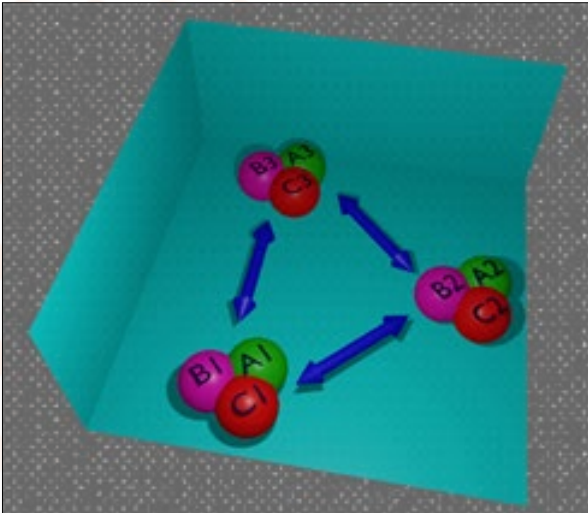
Figure 1: Schematic representation of Individual Viral Transmission (VTi) of Covid-19.

In creating the mathematical algorithm VTi, CRUZ RODRIGUEZ L. and SANCHEZ BATISTA L. utilized the inverse Gaussian distribution or inverted Gaussian bell curve adjusted to the objectives of this present work.

The graph (Figure 2) facilitates an interpretation of a physiological qualitative research of parameters A, B, C related to the viral transmission of Covid-19.

The equation is defined by the following mathematical function:

$$f(x) = \alpha e^{\frac{(x-b)^2}{2C^2}} - d$$

where α, b, c and d, are constants in the domain of real numbers, (c > −1).

α=D*100001
b=9841
c=4*104
d=D*100000
x, Domine (V)

The subtraction between parameters α and d (α-d) is the "vortex" the lowest value VTi (value is D) in the inverted bell-shaped graph. Constant b is the center of the inverted bell in the x axis (V=9841) (Figure 2); while c (4*104) is the standard deviation that modulates the width of the bell.
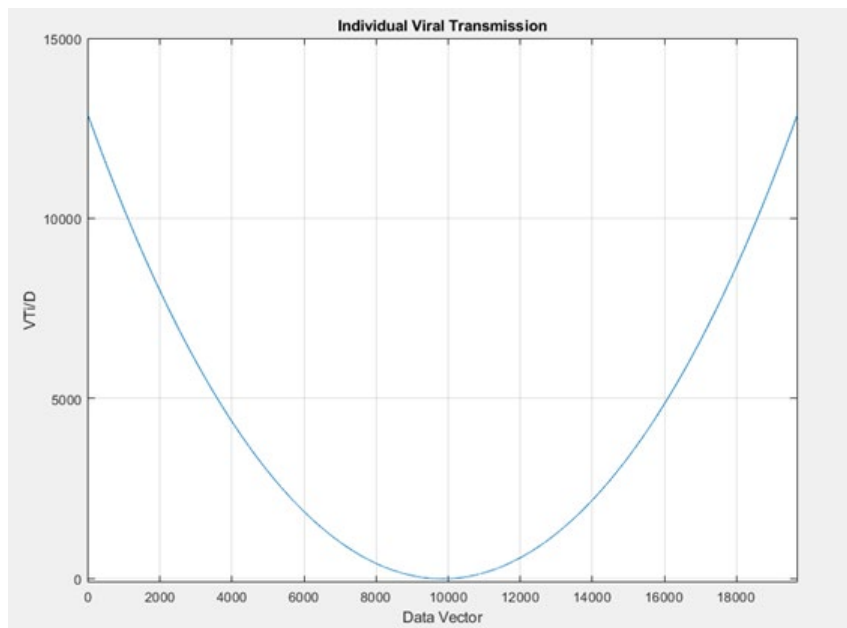
Figure 2: Represents the graph of the distribution of the Viral Transmission of Covid-19 from the Data Vector.

c)   Closed Space Viral Transmission (VTcs)

Calculation of VTcs at random distances between individuals (fetuses, living individuals, deceased individuals) in a given enclosed space at a given temperature.

$$VT_{cs} = \frac{T \, \Delta VT_i}{Vol}$$

VT_{cs} unit: (°C/ m³) San: Bat

VTcs Unit: Bat (The unit of measurement Bat has been assigned by Luis CRUZ RODRIGUEZ in acknowledgement of the collaboration of Lenier Sánchez Batista in the development of this algorithm.
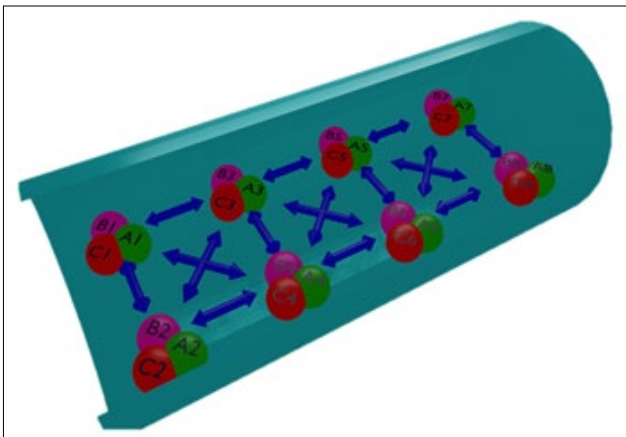Where:
VT_{cs} : Closed Space Viral Transmission
T : Corporal Temperature (Higher VTi) - Room Temperature [°C]
ΔVT_i = (Higher VT_i) - (Lower VT_i)
Vol : Closed Space Volume [m³]

In Figure 3 (below) the dependency of the viral transmission on the number of people in a given volume is shown in a schematic way.

Figure 3: Schematic representation of Individual Viral Transmission (VTi) of Covid-19 in Closed Spaces (VTcs)

The enclosed spaces can be:
d)   Modes of transportation:
                Autos
                Buses
                Trains
                Underground Metro*
                Airplanes
                Ships
e)   Buildings:
                Houses
                Hotels
                Restaurants
                Hospitals
                Schools

Laboratories
Halls (Cinemas, theaters, churches, mosques…)
Factories/abattoirs
Mines

Calculation of VTi and VTcs:

Codification of Parameters
The codification of the vector V (B C A) was made possible by the ternary code (0; 1; 2)
Where we defined that:
f)   0: corresponds to the lowest value of the normal physiological range
g)   1: normal physiological range
h)   2: highest physiological range

*The variable age will only be codified in the ternary code (0; 1; 2), corresponding to: (fetal individuals; living individuals; deceased individuals)
*The variable sex will only be codified in a simplified code (1; 2), corresponding to: (normal sex; hermaphrodite sex)

Results and Discussion

Analysis of extreme physiological situations in each individual in the codification of Viral Data (V) is as follows:
V= [B   C   A   ]
V = [(cholesterol, glycemia, Hb/glycated Hb) (glycemia, body weight, height) (age, Hb, sex)]

1. If the physiological values of: cholesterol, glycemia, Hb/glycated Hb, glycemia, body weight, height, age, Hb, and sex are below the normal physiological range
Then,
        V = [0 0 0 0 0 0 0 0 1]
The ternary notation becomes decimal,
      where:
      V = 1
Substituting for the decimal value

$$VT_i = D\left[100001 \, e^{\left[\frac{(1-9841)^2}{8(10^8)}\right]} - 100000\right]$$

$$VT_i = 1.2867 \, (10^4) \, D$$

2. If the physiological values of: cholesterol, glycemia, Hb/glycated Hb, glycemia, body weight, height, age, Hb, and sex fall within the normal physiological range
Then,
        V = [1 1 1 1 1 1 1 1 1]
changing from ternary to decimal notation,
where:

$$V = 9\,841$$

Substituting for the decimal value:

$$VT_i = D\left[100001\, e^{\left[\frac{(V-9841)^2}{8(10^8)}\right]} - 100000\right]$$

$$VT_i = D\left[100001\, e^{\left[\frac{(9841-9841)^2}{8(10^8)}\right]} - 100000\right]$$

$$VT_i = 1D$$

3. If the physiological values of: cholesterol, glycemia, Hb/glycated Hb, glycemia, body weight, height, age, Hb, and sex fall above the normal physiological range

Then,

$$V = [\,2\;2\;2\;2\;2\;2\;2\;2\;2\,]$$

the ternary notation becoming decimal:

$$V = 19\,682$$

Substituting for the decimal value:

$$VT_i = D\left[100001\, e^{\left[\frac{(V-9841)^2}{8(10^8)}\right]} - 100000\right]$$

$$VT_i = D\left[100001\, e^{\left[\frac{(19682-9841)^2}{8(10^8)}\right]} - 100000\right]$$

$$VT_i = 1.2870\,(10^4)\,D$$

Conclusions

Utilizing VTi standards, whether free or restricted movement of people in open spaces, can be predicted.

Fetuses present a coefficient of viral transmission of Covid-19 lower than that of living beings.

Deceased individuals present a coefficient of viral transmission of Covid-19 higher than that of living individuals and fetuses. Utilizing VTcs standards the prolonged safety of individuals in a given enclosed space such as buildings and modes of transportation can be predicted.

Insufficient research leading up to purported species-species (VT) is highly alarming to model and help predict if possible future pandemics. We know viral epidemics are becoming more frequently episodic, yet we always have assumed a systemic closed biology. This may be a faulty discipline assumption since the increasing episodic nature of viral transmission bears scrutiny on potential physiographic-climactic links. These in turn are open to geogenic-geological connections with terrain biology and ecology [15].

Pangolins have now been removed from the alternative medical list in China. However the entire environmental etiology of the CoV family is unsettled as is their spread and repositories.

The whole biological cycle of the virus and host and the evolution of the epidemic, especially when the epidemic will reach its peak is unknown. A more nuanced genomic diversity related to environmental ecology would help. Terrain-controlled genomic studies in soil geo-microbiology and invertebrate Medical Geology to higher species-species transmissions studies are recommended.

This may extend the viral genomic phylogenic trees beyond the species-species barriers and diversity of potential future impacts. The discipline of Medical Geology can translate this enigmatic situation using its potential to understand the planet and human-animal health relationships.

One aim of this is to better understand potential dormant repositories of outbreaks and potential spread of those repositories, together with potential geological-geogenic terrain factors in closed space and their triggers. Integrated research on closed spaces favorable or not to virus transmission subject to certification along with opening diversity research in viral Medical Geology studies, as a new discipline is anticipated.

Economic Perspectives

Being able to issue certificates to validate the prolonged safety of individuals in given enclosed spaces will allow for a better control of the viral transmission of Covid-19.

Validation of safe work in given working mines where there is minimal temperature control raises another issue of ventilation control: It is known that gaseous minerals can potentiate the propagation of aerosols, and therefore, a control of the mining process could be favorable in reducing the viral transmission of Covid-19. For instance, temperature and humidity relates to ventilation in the mine environment. Moreover, the third mode of Covid-19 infection, that is aerosols which do not settle out viral laden droplets to ground are persistent and essentially permanently airborne in closed space.

Aerosol gases may be colloidal or complexes combined with humidity and temperature that can be problematic. Similar issues may exist in abattoirs for example. In the Australia and Canadian mining environment, isolation and fly-in-fly-out mining which is normal in remote locations, have seriously

disrupted activities from Covid-19. Should outbreaks occur in the mine environment closures have immediate economic implications to the national balance of payments. Australia, South Africa, Canada for example are heavily dependent on mining. Australia finds itself in recession for the first time in 30 years, though perhaps because of mining one of the best performers in the OECD, despite Covid-19. This is now at risk should the country which had seen only some 100 Covid-19 deaths have a more serious second wave outbreak. If this occurs the consequences for the country will be catastrophic, likewise for similar economies.

In the wake of pandemics recession is the norm, and better managing this impact is critical. Certified factors modelling may therefore have important consequences with positive social and economic impacts.

In economies so heavily reliant to mining: Australia, Canada, Africa, China, Russia, Iran, South and North American countries, these are critical activates to help keep their economies afloat. In such cases and others of daily lives amidst closed spaces, certification will likely therefore yield positive outcomes towards national economics.

The same applies to beneficiation and factories including agricultural facilities such as abettors. This transcribes to a better life for societies since viral epidemics and their frequency will most certainly be more regular in future. Moreover, the current epidemic persists, evidenced by serious second waves with the global infection rate climbing, indeed unabated.

With ever more persistent episodic viral pandemics coming and our current Covid-19 pandemic, what is at stake for the world economy here is its basic pyramidal legs; its raw materials, without which the anthropocene grinds to a halt.

References

1. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R (2020) "Features, Evaluation and Treatment Coronavirus (COVID-19)", SourceStatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020-Mar 8.

2. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, Si HR, Zhu Y, Li B, Huang CL, et al. (2020) "A pneumonia outbreak associated with a new coronavirus of probable bat origin". Nature 579: 270-273.

3. Gralinski LE, Menachery VD (2020) "Return of the Coronavirus: 2019-nCoV". Viruses 12(2): 135.

4. Cruz-Rodriguez L, Dilsiz N, Ziarati P, Lambert Brown D, Hochwimmer B, Zayas Tamayo Am, Sanchez Batista L, Moradi M (2020) "a mirna-peptide fusion as a vaccine candidate against the novel coronavirus (covid-19). exosomes as potential biomarkers of sars-cov-2 in lung: after and before vaccination lcr_2020_b008-13" International Journal of Infectious Diseases and Research, I J Infectious Disea; 2020. https://unisciencepub.com/wp-content/uploads/2020/05/A-miRNA-PEPTIDE-FUSION-AS-A-VACCINE-CANDIDATE-AGAINST.pdf

5. Wang Z (2020) "A Handbook of 2019-nCoV Pneumonia Control and Prevention", Hubei Science and Technology Press. January 2020.

6. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, Zhao X, Huang B, Shi W, Lu R, Niu P, Zhan F, Ma X, Wang D, Xu W, Wu G, Gao GF, Tan W (2020) "A Novel Coronavirus from Patients with Pneumonia in China, 2019." N Engl J Med 382(8): 727-733. doi: 10.1056/NEJMoa2001017.

7. Centeno JA, Finkelman RB, Selinus O (2016) "Medical Geology: Impacts of the Natural. Environment on Public Health": Geosciences 6: 8. doi:10.3390/geosciences 6010008.

8. Selinus O, Alloway B, Centeno JA, Finkelman RB, Fuge R, Lindh U, Smedley P (Editors)(2005) "Essentials of Medical Geology". Elsevier, Amsterdam, 820 p. (second edition published by Springer 2012).

9. Selinus O, Finkelman B, Centeno JA (2010) 2009. Editors." Medical Geology – a regional synthesis". Springer. 2010.

10. Hochwimmer B, Cruz-Rodriguez L (2005) "The Polygonal Vortex Mineralisation Model: a predictive tool of health indices and the proposed use of such "geologically based public health indices as a sub discipline of Medical Geology". 2005, ISBN 969 7117 03 7.

11. Cruz-Rodriguez L, Hochwimmer B, Selinus O (2005) "Medical Geology in Cuba". 2005, ISBN 969 7117 03 7.

12. Hochwimmer B, Ziarati P, Selinus O, Elwej A, Lambert Brown D, Zayas Tamayo AM, Moradi M, Cruz-Rodriguez L (2020) "A predictive geological tool of Type3 Diabetes (Alzheimer's disease): The Polygonal Vortex Mineralisation Model a Medical Geology perspective"; Journal of Diabetes and Endocrinology Research 2020 April, 2020 Volume 2, Issue 2. https://unisciencepub.com/wp-content/uploads/2020/04/A-Predictive-Geological-Tool-of-Type-3-Diabetes-The-Polygonal-Vor.pdf

13. Cruz-rodriguez l, Zayas Tamayo AM, Sanchez Batista l, Lambert Brown D, Hochwimmer B, Ziarati P (2020) "A Novel vaccine candidate with double antiviral activity against the HIV-1 and Covid-19": International Journal of Infectious Diseases and Research,I J Infectious Disea; 2020. https://unisciencepub.com/wp-content/uploads/2020/05/A-Novel-Vaccine-Candidate-with-Double-Antiviral-Activity-against-the-Hiv-1-and-Covid-19.pdf

14. Cruz-rodriguez L, Cruz-rodriguez LD, Sanchez Batista L, Hochwimmer B (2020) "Calculation of Fusion Stability of [DNA or RNA] - Peptide (FS) Algorithm "Cruz-Rodriguez" J B & Bio Engine; 2020, vol 2, issue 1. https://unisciencepub.com/wp-content/uploads/2020/05/CALCULATION-OF-FUSION-STABILITY-OF-DNA-OR-RNA-PEPTIDE-FS-ALGORITHM-CRUZ-RODRIGUEZ.pdf

15. Cruz-rodriguez L, Lambert Brown D, Hochwimmer B, Selinus O, Cruz-rodriguez LD, Cruz-rodriguez ME, Zayas Tamayo AM, Sanchez Batista L (2020)"A RNA-Peptide fusion as a vaccine candidate against the novel Coronavirus (COVID-19)"; Journal of Diabetes and Endocrinology Research 2020 April 2nd, 2020: J Diabetes Endocrinol Res; 2020: vol 2 issue 1. https://unisciencepub.

com/wp-content/uploads/2020/04/A-miRNA-PEPTIDE-FUSION-AS-A-VACCINE-CANDIDATE-AGAINST-THE-NOVEL-CORONAVIRUS-COVID-19.pdf

16. Kucharski AJ., Timothy W Russell, Charlie Diamond, Yang Liu, John Edmunds, Sebastian Funk, Rosalind M Eggo (2020) "Early Dynamics of Transmission and Control of COVID-19: A Mathematical Modelling Study", Lancet Infect Dis 20(5): 553-558. doi: 10.1016/S1473-3099(20)30144-4. Epub 2020 Mar 11.
17. Jinming Cao, Xia Jiang, Bin Zhao (2020) "On the Human Infectious Disease Covid-19 Protective Clothing" International Journal of Infectious Diseases and Research Volume 1: Issue 1, 2020.

Annexes