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Virus, Veritas, Vita

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Virus, Veritas, Vita

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More by accident than by design, a special themed issue on infectious disease in the Postgraduate Medical Journal was planned last year but comes out in this *annus horribilis* overshadowed by COVID-19. Although the Postgraduate Medical Journal champions many themes of contemporary relevance and significance, including equal opportunity,[1] gender equality[2] and burnout,[3] it has also been receiving many manuscripts and images related to infectious disease. Therefore, this is a good moment to focus on what is preoccupying people most in the world today.

COVID-19 began in December 2019 as a mysterious cluster of atypical and life-threatening pneumonia in Wuhan,[4] a modern commercial and industrial city of more than 11 million inhabitants (more than London, UK). These patients were not the typical frail and elderly pneumonia patients, and they did not respond to antibiotics. The clinical picture resembled the atypical pneumonias caused by SARS coronavirus 17 years ago. This time round, the virus was rapidly identified and its sequence was published in January 2020.[5] On 3 January 2020, before the Chinese government publicly acknowledged an epidemic, the US Centers for Disease Control and Prevention was informed. The World Health Organization (WHO) initially thought that the outbreak was largely limited to China and there was no need for widespread panic. The WHO Collaborating Centre for Infectious Disease Epidemiology and Control, however, announced on Chinese New Year's Day that the virus disease from Wuhan would rapidly involve cities within and outside China because of rail and air travel.[6] This was only a mathematical projection, but nevertheless rang the alarm bells. There were already hundreds if not thousands of cases in Wuhan. The early epidemiology showed that the reproductive number (R_0) of the virus was around 2,

which means that on average, each infected person would infect two other persons. An R_0 greater than 1 means that the epidemic can take off. To stop the epidemic, the R_0 must be reduced to below one. This was done in China, with lockdown of cities and severe restrictions on travel, quarantine of infected and suspected cases and contacts. This ancient method of isolation started by 14th century Venetians remains an effective way of containing the spread of the disease.

Unfortunately, before this was done, people carrying the virus, some of whom might be asymptomatic, had travelled far and wide. In a matter of weeks, there were alarming increases in the number of infected cases in South Korea, Iran and Italy, followed by other countries such as Spain, Germany, France, Switzerland, UK and USA.[7] The WHO, extremely reluctant to announce a pandemic at first, finally admitted that fact on 11 March 2020. As at 31 March 2020, there were 858,319 cases and 42,302 fatalities.[7]

There is enormous controversy surrounding the name of the virus and the infection. The correct names at present are SARS-CoV-2 and COVID-19 respectively. The WHO justifiably takes the view that new infections should not be named after places, occupations etc. as that could cause stigma. China, naturally, dislikes the virus being named after Wuhan. In this era of political correctness, there is a point, although in the olden days, naming leprosy and plague after Hansen and Yersin, respectively, was a mark of respect. Nevertheless, calling the disease Wuhan or Chinese coronavirus gives the misleading impression that if you are thousands of miles away, you would not catch the disease. Sadly, the origins of the virus is still

unknown, because the Wuhan Seafood Market has been thoroughly sanitised. Neither the suspected animal host, nor the first infected patient, have been found.

The epidemiology of COVID-19 is terrifying. The number of affected cases has been doubling every three days in multiple countries (Fig. 1). When the number of deaths exceeds three figures, politicians' hands are forced and drastic measures have to be taken belatedly. Schools have to be closed. People have to work from home. Travel has to be banned and borders are closed. This is a historical juncture for human civilisation. If unchecked, half the world's population could be infected with corresponding numbers of the dead; case-fatality rate stands at around 1% in developed countries but can be higher in poorer countries, or when medical services are saturated.

As can be seen in Fig.1, which shows the case numbers and fatalities in the ten countries with the most cases, the number of cases and fatalities rose exponentially irrespective of ethnicity, climate or affluence. People in business and finance understand exponential growth very well, but sadly the public, and many journalists do not. There is astonishment at the daily 'record-breaking' number of new cases and deaths. Due to misplaced complacency, opportunities to contain the epidemic was missed during the early phase of exponential growth. Exponential growth is horrifying; imagine an inflation of 100% every three days!

Although vaccines are now being developed and will shortly be tested, they will not be available soon enough to save the world. Remdesivir, developed by Gilead for Ebola virus, is now undergoing clinical trials in Wuhan and the US. It did not work for

the Ebola virus despite much fanfare, so we can only keep our fingers crossed and pray that it might work for COVID-19. Like HIV, a single agent may not be as effective as a cocktail of agents. Kaletra, a combination of lopinavir and ritonavir, is being tested. The early results are not encouraging.[8] President Trump opined that chloroquine (or its less toxic equivalent, hydroxychloroquine) might be useful. Using a combination of existing drugs to combat the new virus is probably the most practical strategy, but we must manage our expectations in that while treatment might shorten the duration of the illness in early or mild disease, in advanced disease characterised by lung fibrosis and respiratory failure, the prognosis is likely to remain poor.

In hospitals, proper triage of patients to separate infected patients from vulnerable patients is important. Testing for the virus must be rapid and the throughput has to be high. Most hospitals do not have enough isolation facilities and intensive care beds to cater for an exponential rise in COVID-19 patients. The desperate situation in Lombardy is a painful lesson for all. Unfortunately, the UK and the US are going down the same path. The governments in countries fortunate enough to have few cases at present should aim at containing the infection so that there are enough hospital beds and facilities, and importantly, hospital staff, to cope with the stream of patients. Once the number of new infections equals the number of recovered and discharged cases, the situation will stabilise.

Whilst governments can enact policies to restrict travel and gatherings (Table 1), every person in the community can do their part (Table 2). Hand sanitation, not touching mucous membranes with unclean hands, wearing a mask in crowded

places and good environmental hygiene are all important. In multi-storey buildings, making sure that the plumbing is up to standard and keeping the lid on when flushing the toilet should be practised.

COVID-19 is putting the whole of humankind at stake. It is neither a Chinese virus, Japanese virus or Italian virus. It is 'one world, one virus'. Increasingly, it looks like 'one solution' too. Concerted actions from governments and taking personal responsibility for one's health and preventing people around you from infection should lift us out of this crisis. There is light at the end of the tunnel. The countries affected by COVID-19 earliest are showing signs of recovery. The number of cases in China has dropped dramatically. The number of new cases in South Korea and Japan has also greatly declined. The exponential rise in Italy and Iran is now less steep. In time, other countries will follow suit.

Once the pandemic is over, there will be recovery, but the world will be changed forever. People will be more health conscious and there will be public consensus for more funding on health, on building hospitals and on research. People will be more accustomed to online teaching and learning. More people will work from home, which would be a great boon to families with young children or elderly who needs looking after. Unnecessary meetings will be phased out. Performers, many of whom are out of work at the moment, will transition to presenting their performances online and recording them for posterity. While many businesses will fold, others will take their place. People now have more leisure time, because of less commuting to work, and have more time to read books, learn new things, grow their gardens and make

proper meals. While I would not encourage people to find *veritas* in *vino*, I am hopeful that *la vita* after the coronavirus is *dolce*.

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Table 1

Public health measures to reduce the transmission of coronavirus

Public health measures	**Examples**
Travel restrictions	Border closure, port closure, flight cancellations, compulsory quarantine of travellers
School closures	Closure of nurseries, schools and universities
Working from home	
Reducing public gathering	Closure of non-essential shops, bars, restaurants, cinemas, theatres, sports grounds, gyms and places of worship.
Screening for fever	Temperature checks at entrances
Diagnostic test	Rapid high throughput test made widely available
Isolation and quarantine	Isolation of close contacts and people tested positive. Quarantine of travellers.
Opening dedicated wards or hospitals	Isolation wards attended by staff with personal protective equipment
Releasing prisoners	
Lockdown with law enforcement	Stay at home except for essential activities, business or travel

Table 2

Personal health measures to reduce the transmission of coronavirus

Personal health measures	**Examples**
Stay at home	Work from home, online learning.
Eat at home	Avoid bars, restaurants. Order take-away food.
Shop at home	Shop online, use online banking.
Use contactless payment	Avoid using banknotes and coins if possible.
Social distancing and avoiding gatherings	Use electronic communication. Keep at least 1 metre away from others.
Hygiene	Hand hygiene, not touching mucous membranes. Frequent hand washing and use of alcohol rub.
Sanitation	Disinfection of lavatories, flushing toilet with the lid on, and thorough hand washing
Cleaning and disinfection	Clean and disinfect surfaces regularly and after use.
Appropriate personal protective equipment	Mask, eye shield if appropriate
Protect other people	Avoid contact with other people if one has fever or other symptoms. Cover mouth and nose when coughing or sneezing

Fig. 1A Cumulative Number of Diagnosed Cases

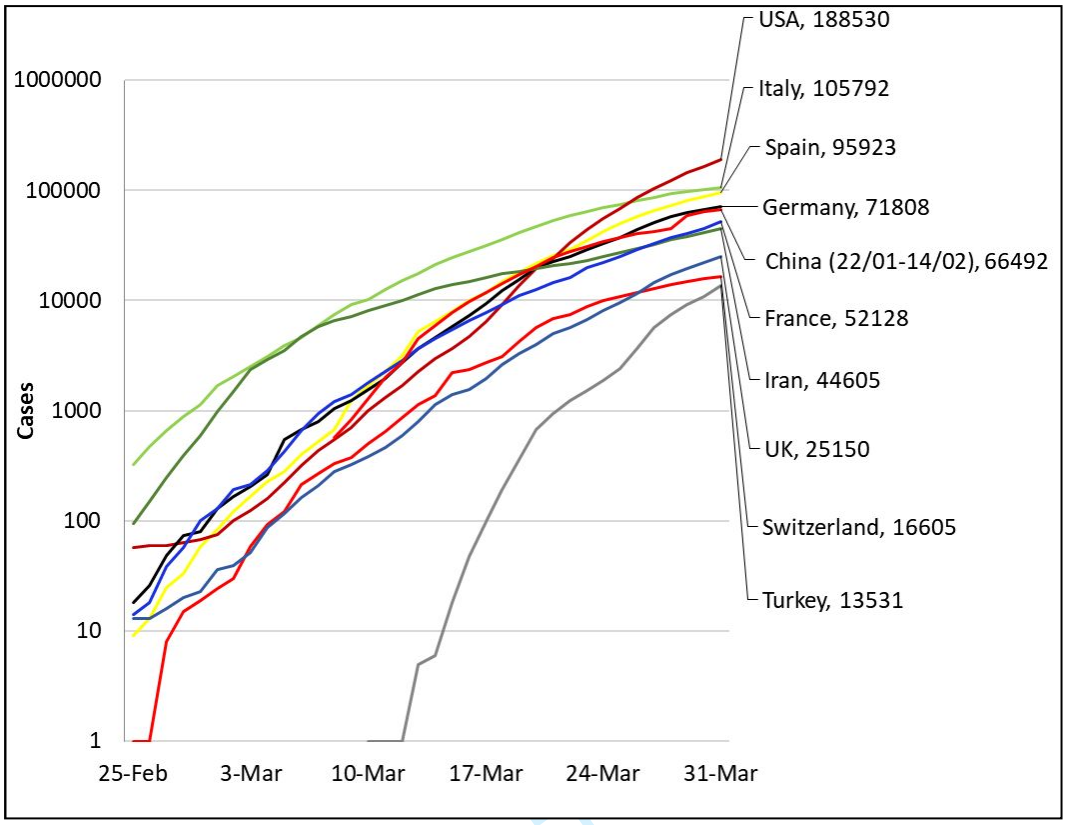

Fig. 1B Cumulative Fatalities