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## ***Social Complexity, Pathogen Adaptation and Covid-19: History of Disease Avoidance, Social Spacing and Work/Home Matrix***

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### **Introduction**

Social distancing and quarantine are not new methods to control and shape epidemics. Invented during the Bubonic Plague in the 14<sup>th</sup> century in Venice, they have varied as have human responses to isolation. Today separation of workers from co-workers has taken place in a new context.

Current restrictions on work environments have left many people separated from their jobs. This creates several changes in life style. First, the work environment provides individuals with both an income and a sense of worth. Second, the interaction with people at work, typical experiences with others like lunch staff and support crew are reinforcements of social capital where individuals experience generally positive rewards. Thirdly, many people invest considerable emotional support in co-workers, in some cases this has been expressed as pseudo-kinship in a number of forms, for example, the ‘work spouse’.

### **New Forms of Family and Work**

In reports of past epidemics families were often trapped in their homes and refused the freedom to exit by authorities. We have good evidence from both Europe (Coulton 1930, Cipolla 1973) and the Middle East (Dols 1977) and ethnohistorical evidence regarding this practice (Caldararo 2012). Often people were aided by authorities if suspected of infection; sometimes they were attacked or driven out. Generally social institutions guided and framed the specific kind of treatment and the responsibility of individuals to act in accordance with rules regarding avoidance.

### **Background of Trouble in Stay-at-home-Covid-19**

Today we find the general population in significantly different contexts due to the change in the nature of modern work, family and associations. People commute for several hours, according to the United States Census Bureau (2017). For couples or families this can create serious problems of association, especially if the adults work different shifts or hours. In general, it means that many families spend little time together. The flight to suburbia in the post-WWII period saw an effort to provide adequate and safe housing (Fossum 1965). This led to isolation and psychological conditions critics attached to developments as Levittown. Gans (1967) argues that these produced supportive communities as in older ones (1951, 1962). The concept of vibrant communities united by extended families or neighbourhood friendships creating foundations for social capital is appealing.

Today more than 70% of all children live in a home where both parents work (Williams and Boushey, 2010).

A telling consequence of the economic shutdown and social distancing has been the increase in child and spousal abuse and lack of food security.

Of interest for ideas and plans of recovery, is the curious nature of individuals who are asymptomatic but test positive for Covid-19. Recent reports from China indicate that 60% of new positive tests show non-symptom individuals. Another issue is whether individuals who have recovered are infectious or can be re-infected. Usually people's immune systems produce antibodies against a pathogen. In the case of Covid-19, some people produce an immune response without symptoms; some other produce a form of antibody that is ineffective and even can enhance the infection and disease progression (Wu et al. 2020, Iwasaki and Yang 2020). These facts might make the idea of effective recovery and containment difficult and confronting a second wave of disease (Yang et al. 2020). This may indicate that the virus is adapting to different populations and subsets of age groups, as in reports of young patients presenting stroke as Covid-19 infection (Oxley et al. 2020).

Many aspects of urban living are under stress, global food chains are failing and food banks in developed countries are running out of supplies. In high concentration population areas where nations' policies have made transportation difficult, many of the poorest are stranded and without access to food (Husain et al. 2020).

### Human Responses to Disease: Perceptions, Culture and Fear

Perception shapes response to threat. Already by late April Sweden's Covid-19 numbers are twice those of nearby Denmark that instituted lockdown. Since Sweden's population is nearly twice that Denmark these figures seem to show that no lockdown increased infections, and the effect is not resulting in any change in policy. Norway with half the population of Sweden has about one-third the Covid-19 cases (European Centre of Disease Prevention and Control 2020, Anderson and Pryser Libell 2020). Swedish epidemiologist Anders Tegnell has convinced Sweden it can achieve herd immunity. This has provided the country with a belief in their exception. If people believe they are not in danger, as in the statements of Jair Bolsonaro in Brazil, their behaviour will follow

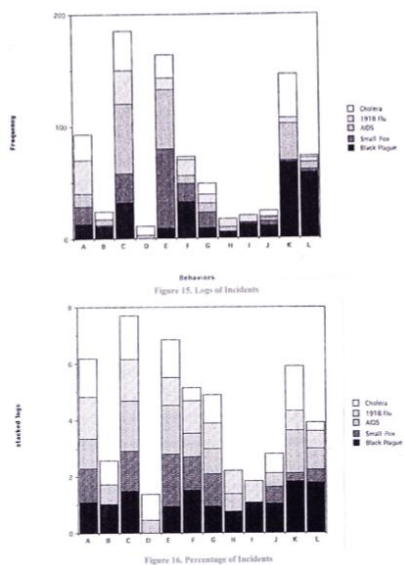


Figure 1. Chart From Caldararo, 2012: Behavioural Responses to Diseases

Cultural response to disease shows an independent and generally unrelated pattern. Data sources have changed in recent weeks; for example, in France home care infections and deaths were not initially included (Rankin 2020). Reportage of infections and deaths seem to be affected by a number of factors. Reference to historical averages of deaths by season indicate death rates are about 60% higher than normal (Burn-Murdock et al. 2020).

The UK and France have comparable per capita rates but the geographic division fails in comparing Portugal and Greece to Spain and Italy (European Centre of Disease Prevention and Control, 30 April 2020). The connections of the viral strains from China and the transit of individuals (Rutherford 2020) seem to interrelate with cultural and behavioural differences. One additional factor is the socio-economic aspect where we find immigrant groups like the Bame from Somalia in Norway with high rates (Cookson and Milne 2020) in the USA and UK where minorities, especially African Americans, are hard hit by co-morbidities and poverty in housing status and jobs. Many are in low-paid delivery, stocking and clerking positions, as well as health care and care for aged individuals (Yancy 2020).

The use of new technologies and intensive tracing of contacts by government action is a different response and has been effective in South Korea, Germany, Israel and China (Huang et al. 2020). The USA response and in the UK have been disorganized with the exception of some regions, as in California.

A comprehensive study of available ethnographic and historical evidence of human response to disease threat found similarities with of 5 major infectious diseases registering less than 25% agreement; that is, there was no uniform pattern of response (Caldararo 2012). This would indicate perhaps that while the diseases are assumed to be relatively new to human experience, the evolutionary value of uniform behavioural response remains learned or passed down via myth, tales or other cultural means. It seems that humans lack instincts concerning disease or threat recognition (Frey et al. 2010).

We might expect human responses to be based on rational interpretation of signs and signals. Yet our information indicates that fear or perceived threats, as defined culturally, and individuals' experience is processed into risks. Mob behaviour, often described as mass psychogenic disease, is an ill-defined process, especially in the current technological environment (Bartholomew et al. 2012). Evidence from antiquity is often clear on the irrational nature of responses (Hope and Marshall 2000).

We should note that even in cases where adaptations to disease have developed into complex systems, novel disease overcomes them. If social distancing in Covid-19 is adaptive, is resistance to it maladaptive? My 2012 study showed that the patterns of disease response to SARS and MERS differed little from past epidemics. Current responses to Covid-19 show similar behaviour. New technology has allowed quicker identification of the virus, its genome and mechanisms of attack. However, treatment, cures and mobilization have advanced little since SARS and the flu of 1918-1919. Perhaps there is less violence and victimization so far.

## **Future of Megacities, Increased Population and Dense Living**

The background to the response to Covid-19 illustrates a global society where atomization and globally oriented manufacturing and distribution are creating fragility where we expect durability. Like a diversified portfolio of equities and bonds, globalism was supposed to make our world more sustainable. Instead it has brought instability to the remotest parts of the globe.

We face a crossroad to human future. Population density, megacities, waste and pollution produce unsustainable conditions. The isolation of social distancing and economic lockdown seem to deprive human society of the ‘hum of the hive’, that has become the nature of being human. One of the least focused aspects of resource scarcity until 2001 has been security and safety (Homer-Dixon and Blitt 1998). The inability of nations to provide healthcare and effective response to pandemics is a telling failure.

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