Note 9 – In public health GOOD statistics are always needed to make good decisions.

Why do we have a statistical problem during this crisis?
Essentially because there is a 100% mortality rate among dead people!

This is just a provocative way to explain where we had major analytics and then communication flaw: ALL the numbers we could read in the press or hear from official sources were misleading as they ONLY accounted for the very sick. Those were the persons who were infected and were hospitalized in severe conditions, the ICU cases, or even those at late stages of the disease who were admitted in Intensive care while dying (with an already too deep ARDS and its complications).

Numerous voices pointed out that to have a decent estimate of a mortality rate for a pandemic, we needed to have the estimate of the TOTAL numbers of infected (most of whom were actually not very sick or even not sick at all) but were ignored. Some newspapers mentioned this whenever they printed mortality rates – but explaining that their numbers may not be accurate does not tell the general population in which direction those inaccuracies go (over-estimation or under-estimation).

There were a few exceptions to this situation like in South Korea (one of the 1st country that was hit), in Iceland, in some parts of Germany, in Sweden, in some States in the US.

Besides this HUGE bias problem, some additional decisions were made that led to another cause of inflation and thus to an additional artificial increase in the mortality rates:

- Decision to include ALL suspected mortality to COVID19 – even when not proven (as requested by Dr Birx, USA). This would lead to overestimates – and it has to be mentioned. However when the medical system is at a near halt, one could reach a point where those deaths represent the patients without viruses that were NOT taken care of. There are numerous reports of community practices, MD's, and even specialists who report that they used to see and treat 50-100 patients a day, and are now down to a few like 3-5 ! What happens to the persons who needed critical care on any given day ?

- Decision to include all excess deaths in the reports – some linked to COVID19, some not linked to it and, some even provoked because the patients without ANY infection were NOT treated at all. This method would be the best one if the medical system was functioning normally. But it is not the case thus mentioning or using *excess death numbers* is wrong, as it compares apples with oranges. Without any testing one cannot use such data.

- Decision to either not test any suspected case, or to reserve testing for the most severe cases – which is totally arbitrary because based on the doctor's impression or experience or - worse - access to tests. What can a doctor or a nurse do in such cases ? They sent patients with mild fever or cough back home, not knowing what their problem really was.

- Decision not to focus as soon as possible on building (or even buying) test capacity (both genetic like PCR and serologic) [South Korea did set up its tests in December 2019]

There are however some good reasons to this situation:

- Tests to estimate the virus presence and numbers (load) in a person are based on genetic sequences (test PCR) and have some failure rates and some mutations will not be caught. Hence a setting up time was needed.

- Tests based on the antibodies present after someone has been exposed to the virus were not widely available. They usually take a few weeks to set up.
  [Note : antibodies stay present in the blood serum after an infection – this is called seroconversion – and is PROOF of an infection, even when the antibodies are no longer effective because the virus may have mutated, even if they have NO virus-blocking activity. They evidence that the virus was once present in this person]

Old clinical studies from 2003, 2007 and 2013 had the wrong statistics from a Public Health standpoint – but the correct ones form a clinical standpoint. The context of a non-pandemic situation makes this normal.

When there were not enough cases, the focus was correctly put ONLY on severe cases mortality. As mentioned this is logical, but what is NOT normal is to rely on this during a pandemic, after it is evident that better measurements are needed.

About SARS-1,

- About SARS-1, in August 2003, around 8,096 cases tallied with a mortality rate around 10%, no mention of screening of non-symptomatic contacts (Gu et al. 2007) (Rota et al. 2003) (Drosten et al. 2003)
- Same in Chu (in 2003), 8,000 cases from Nov 2002-Jul 2003 with a mortality rate at 7% (and 17% for a subset) – again no screening.
- Fung et al (in a 2019 review), SARS1 cases are listed as ~8,000 with a mortality rate of 9.6%, and for MERS it was 2,000 cases with a mortality rate around 35%. No Screening.
- MERS cases and mortality confirmed by WHO (site accessed in May 2020) 2494 cases, and 858 case-associated deaths (34.4%) (See WHO recent stats reference)
- The same numbers were reported by Channapavanar in 2017 – SARS-1 : 8400 cases with 9.6% mortality and for MERS : 1936 cases with a mortality of 36%.

About SARS-2, *as of February 2020*, there were 80,000 confirmed cases in China with 2500 deaths showing thus a mortality rate around 3% (Lin et al. 2020). Another report one month later in The Lancet, mentioned *as of March 19th 2020*, 200,000 confirmed cases, 95% of which are mild, ONLY 5% of which have severe lung injury and/or Multiple Organ Failure, leading to a mortality rate of 1.4% (Li et al.). Again those are data selectively obtained from people who went to see doctors or were hospitalized only.

All this partial information – based on the patients who were either in ICUs thus very sick, or mildly symptomatic – *while correct to the clinicians* - gave us biased public health responses during this 2020 pandemic. From a public health standpoint, this is not an unknown *unknown*; it is a KNOWN unknown to every professional in the field.

Then publishing daily numbers of total deaths – some of which may not even be related to the virus, some of which may have already a dire and mortal condition – without knowing the most important parameter, has no rational explanation and could be considered disingenuous at best.

There are a lot of asymptomatic cases, or cases with mild symptoms, so the clinical statistics do not tell us anything about the real mortality rates. They should not even be used when communicating to the population.

In March 2020, Hennegan et al. issued a report from the Centre for evidence-based medicine at Oxford University in the UK to raise this classical question (See Hennagan et al. 2020). They analyzed 21 different reports and studies published since the beginning of the crisis. While a couple of those reports

showed around 5-10% of people could be asymptomatic, most of those reports had larger numbers mostly between 20-40% with some at 60 or even 80% being without symptoms. Whatever the real numbers are, as expected in all those a **very large fraction is asymptomatic**.

Usually even when a person is NOT symptomatic, s/he could presumed to be contagious because the virus is there, but reproducing less aggressively, and it can be shed out by the plain respiration (aka. as tidal respiration). One does not need to cough and have droplets to be infective. This may or may not have been mentioned. At the same time, there were reports in the press of "mystery cases' – that is cases where NO human-human contact history had happened. Those community-based cases are not mysterious; they reflect the fact that viruses can also be travelling the planet outside the human bodies. (See Note 6 – virus are airborne).

A very recent paper (Li et al. Science, May 2020) did model the spread of undocumented cases, and estimated it at 86%. However their claim that the situation improved AFTER the travel ban is totally unwarranted. It mostly improved documentation of the severe cases, while still missing ALL if not most of the people who were positive without being sick. But such data is actually confirming the importance of non-direct human-human transmission, because such rapid spread started most likely before any travel ban and contact tracing. Such data also support the fact that by focusing on the clinical and most sick cases, most of the actual positive cases were missed.

Japan studied their nationals who were evacuated from Wuhan as soon as they debarked from planes in a very well controlled study, and found that the number of positive cases without symptoms – that is the persons who are infected, contagious and NOT sick – was 30% (see Nishiuara et al. Int. J. of Infectious Diseases. 2020).

An official communication by the Director of the South Korean CDC (center for disease control) reported that more than 20% of the persons being tested were not showing symptoms. South Korea did more testing so far than any other country, and those values fit well within the other reported values, while at the same time consolidating them given the extensive tests that were done (see Korean TV program on 16 March 2020).

Most persons are and will remain without symptoms. However when symptoms start, SARS-2 goes very fast. UC Davis reported a community case where a barely sick person deteriorated in 24 hours. [Quote] "Within 24 hours of admission, her respiratory infection deteriorated to the point where she was intubated and given a series of antibiotics that failed to clear the source of the infection, according to the report" (See news report KCRA).

How to obtain the NEEDED numbers: the total number of infected people?
And what about the real mortality rate after infection?

After nearly 5 months, one would/should have started to do this. Testing for sero-conversion, that is the presence of antibodies in the blood. The debate about the immunity from the antibodies or about the overall performance of the test is NOT relevant. EACH and every test done daily in our hospitals always has a few percent of mistakes. This is about identification not about immunity, which is a separate issue. There are 2 ways to obtain such useful information:

- One would be to test the **whole** of the population. This would be quite costly, would bring logistics problems and is time consuming. While costs and logistics are political decisions based on expert advices – **Time** is not! **Time** cannot be, as the virus follows it own tempo, and its speed to infect and generate serious complications if part of our problem.

- A second one would be to do **random** testing in communities or across a country. One can also do this based on demographics. Then one can project those results with some confidence on the WHOLE of the population. This is regularly done in public health estimates, and is not different than some refined political pollings. If done well, this can be quite accurate.

We could learn from some screening that was done during the past MERS outbreak in 2014 in Saudi Arabia. However it was not random, not demographics - 5065 persons were screened but ONLY from suspected patients consulting for a viral disease (virology lab samples) and their contacts and also the Health Care workers. So this is also a bias, but a lesser one. This gave a 2% infection rate. While it is far from perfect, the study included a follow-up for 12 months, and this rate oscillated between 2.6 and 1.6% (Memish et al. 2014). We have to understand that using such 2% value – which does not tell us anything about the true infection rate in the population - would immediately decrease the mortality rate enormously. (# deaths divided by 2 % of the population which was 30.2 million in 2014 so roughly 858 – assuming that most occurred in SA- divided by 604,000). *This is absolutely not correct of course because of the limitations of the study;* also because those were only a part of the pilgrims analyzed, etc… but would be 0.14%! The gross mortality when looking ONLY at sick people who came inside hospitals is around 36%... see the difference? ***We will use this as an example to understand what follows and which was done using more appropriate and valid samplings.***

- In NY, on the 27th of April, Gov. Cuomo announced the results of SYSTEMATIC mass testing (for antibodies): 24.7 % of NYC residents had already met the virus and had antibodies in their blood (forget about immunity, let's just focus on statistics for now. NYC had a total reported of 172,000 cases that were tested positives (no doubt there), and 13,365 deaths. (data from Google statistics, obtained by searching with 'total deaths COVID NYC' on May 2, 2020). NYC has a total of 8,400,000 inhabitants split in 5 burroughs. If 25% have seroconverted – they represent the total # of infected that is needed, such number increases with time also – this number is 2,100,000. Dividing total # deaths/total # infected = 0.6% (less than 1 %).

- The Chair of Emergency medicine at St Barnabas in the Bronx reported that 43% of the residents of the Bronx had already been positive. The population there is 1.48 million. Using other data from JAMA (Wadhera et al, JAMA 2020) – showing a total so far of 224 deaths (tested positive for the virus)/100,000 habitants in the Bronx, and with 43% per 100,000 habitants being the total of positive cases, gives a mortality rate of 0.5% (224 divided by 43,000). Telling the public that one has twice more chances to be sick and die if one lives in the Bronx vs. Manhattan like some reports did, do not tell us ANYTHING about mortality rate due to the virus – which is the REAL risk to the people.

- An analogous but RANDOM study (random sample of 1,400 persons matching the county's population) done in University of Miami (FL) in Dade county reported that 6% of the population of this county have had the virus (between 4.4% and 8% with 6% as best estimate – 95% confidence interval). This corresponds to 165,000 residents, and is 15X times higher than the officially reported positivity rates (let's remember that those are erroneously taken on the persons who are very sick). The total county population is 2.75 million. Contrary to the official communication from the mayoral office, the obvious conclusion is not about the efficacy of social distancing, but about the mortality rate being divided by 15X! Reported to the total number of deaths reported by the Miami Dade county – which is at the same time 302 (data from Google statistics, obtained by searching with 'total deaths COVID Miami Dade' on May 2, 2020) this gives a mortality rate of 0.2% (2/10 of one percent !) Doing the same maths using the official data of only the cases in hospitals gives 2.6% (302/11,570). The numbers that are given to the public nearly 24/7. The fact that the authorities do not correct their mediatized mortality rates raises questions. Even if such test had a false positive rate in 10% of the cases, that means that one out of 10 tests adds a false

count, it will be 12X – so those arguments about test limits fall short. (165,000 minus 10% = 140,000 and 140,000/11,570 = 12.2).

- In Santa Clara County (CA), Stanford University performed a RANDOM serological study (Bendavid et al. MedRxiv April 2020). When projected to the whole county population, the results indicate that between 2.5% and 4.2% of all residents have been infected by the virus. This is between 50 and 80X higher than the results obtained from the ICU and the sick patients and their contacts. Santa Clara county has 1,94 million residents. California population is 35.5 million, between 2-4% makes between 710,000 and 1,400,000 persons. With a total of 2,073 victims (obtained on May 2, 2020 on Google 'total COVID deaths in Santa Clara county'), this gives a crude mortality rate between 0.3% and 0.14%. Same results using the Santa Clara total fatalities at 113. Many criticized the sampling method, claiming that it was biased and collected the more 'concerned and afraid' crowd. Interestingly if it were the case, the differential would be even larger in favor of the Stanford study, as this bias would go in the same direction as the « more sick » bias found in the Emergency rooms.

- Los Angeles county did also a recent study, conducted by researchers from USC, this study was NOT RANDOM but based on a curated database representative of the county population patterns (demographics matching, done by a market research firm). It concluded that 2.8 to 5.5% of the county adult population has been exposed by the coronavirus. That translates to 221,000 to 422,000 residents who have been infected. This puts the rate of infection at 28 to 56 times higher than what was reported so far (see Communication by University of South California). This would decrease the actual death rate by the same factor. Again a quick calculation shows that the more correct mortality rate would be between 0,3% and 0.5% (1209 fatalities for LA county divided by 221,000 or 422,000) (1209 fatalities – see Google Stats on May 2, 2020).

- This shows near identical mortality rates all across the US between 0.2% and 0.5% regardless of the location whenever a randomized or demographics-based sampling and testing was done. In the past few weeks, more than 180 academic centers, hospitals and private manufacturers have notified the U.S. Food and Drug Administration that they intend to create serology tests for COVID-19, according to spokeswoman Stephanie Caccomo. They've been able to jump into the fray because the FDA has relaxed regulations for developing tests as part of its emergency response to the pandemic.

- **The situations and the rates are near identical in other parts of the world:**

- **Iceland**

  Iceland, with a total population of 364,000 inhabitants tamed the pandemic very early and had barely any mortality (10 deaths). No full lockdown, just avoiding large groups gatherings, but proactive actions. Before one mentions that Iceland is an island and this 'easy', it is also worth mentioning that Iceland did early on large scale testing either on the persons at risk (travelers coming back, plus their contacts plus the persons at risk (health care personnel) or at random in their population, or even upon free open invitation in the population also (see Gudbjartsson et al. New England J Medicine, 6 April 2020). In their targeted study, they had to test 9199 persons who had traveled to infected regions, plus their contacts, or the people at risk, and they found out that 13.3 % of those were positive, whether they were sick or NOT. They also did a random testing (sending out invitations to 2283 persons) and found out a positive rate of 0.6%. In their open invitation (not random but open to anyone desiring to be tested), they found a positive rate of 0.8% for the SARS-2 virus.

  From their testing on confirmed and tested sick patients, on can derive a mortality rate for the high risk group of 0.5% (10 deaths/ 1799 confirmed case), data based on the Icelandic

government web site (see at *www.government.is* on March 15th 2020).

From the testing on the general population, if we take 0.8% of the population (number of persons who are infected), we obtain a mortality rate for the infected of 0.3% (0.8% of 364k = ~3,000, 10 divided by 3,000 = 0.3%).

From the Icelandic data, we also learn that during an in-depth analysis of 4,197 samples, they found 425 positives cases, and those split as 1/3 linked to travel, 1/3 linked to domestic infections, and 1/3 for which NO trace of the source is found. This is important to note as human-human transmission – while the most frequent is NOT the only one (see Note 6 on Airborne).

[Note : As kari Stefansson, neuroscientist and Founder of de-Code - the icelandic company that initiated all those tests - said "I couldn't understand how we could calculate out the death rate without knowing the spread of the virus in the community".
This is the core question of this statistical note – it is not so hard to understand, so it must be assumed that in crisis, common sense is the first casualty.]

- **Germany**.

The situation is interesting, Germany has more people than France, more cases than most countries in the EU and still has lower death rates. As of end of March, 31,000 positive cases had been reported for 149 deaths and a mortality reate of 0,5%. (See Vox report, March 27, 2020 – by a well respected journalist, now working for NPR). All of this with a population which is older than most countries. This is the mortality rate based on clinical hospitalizations. This is to be compared with Italy where mortality is at 10% and the US where it is at 1.4-2%.

One of the most careful study was done in a German community of 12,000 people [Gangelt, GE] by the University of Bonn (see Streek et al.). This was a random sampling study – done in accordance of the WHO standards and combining both genetic testing (is the virus there in the person ?) and antibody testing (has the person been reacting to the infection ?) . The results showed that the infection rate in persons who were not sick and thus not seen by doctors was close to 20%. This gave a mortality rate of 0.28 %.
[The study is a good read for MD's and Health professionals]

A respected program on ZDF (Hamburg), presented the interview of an authority in pathology who performed autopsies on ALL 50 victims tested postive for COVID19 at that time. The result was that ALL those patients had some major other intertwined cause of death. SARS-2 was a co-factor like the Flu would be in the same cases (see Interview of Hamburg pathologist Prof. Klaus Püschel).

- **South Korea**.

South Korea has a population of 51 million, and was the first country hit following China. As early as January, when no one paid attention after the first case, SK started to develop and mass produce reliable and controlled testing kits. By mid-february, they could churn out 1,000 of kits per day. By March 5th, they had tested 145,000 people, more than most other countries combined. At that moment, people on social media were openly doubting and dismissive of what the South Koreans were doing. They somehow learned the lessons from the earlier MERS pandemics, and the fact that the former governement was impeached the year before created a political culture of accountability. [This may have played a role in the professionalism of the SK authorities].

To spare hospitals from being overrun with patients, as they were in 2015, Korean officials opened 600 testing centers and pioneered the use of drive-through testing stations to reduce face-to-face contact indoors. Inspired by drive-through counters at fast-food restaurants, these pop-up centers offered patients 10-minute tests without forcing them to leave their cars. (see D. Thompson in The Atlantic, May 2020).

On May 6th 2020, with a total of 255 deaths to date for a total of 10,806 cases, the press and some authorities report a mortality rate of 2.4 % - but with 51 million inhabitants and their reported 20% value for asymptomatic carriers (ie. 10,200,000 cases), the real mortality rate due to

the infection is 0.003% (255/10,200,000). This extremely low number is real, and is likely the result of BOTH the real low mortality of the SARS-2 itself, combined with an extraordinary effective health care system, which is NOT clogged, and likely by intervening always as soon as the first symptom sets in, treats patients early enough to avoids the ICU. So combining FAST responses, systematic testing are keys.

There is however something unexplained. Why all authorities and the press still mentions the 2% mortality rate when they know it is magnitudes lower ? This will warrant quite an explanation !

- **Sweden**.

The case of Sweden is very interesting. The country did not do any lockdown, started early by testing the high risk and the sick patient, then stopped and radically modified its strategy to focus ALL resources on the more fragile and the more at risk. The country is regularly blamed when pictures of happy diners are shown at cafe's terraces.

People and authorities all over the world criticized what they label as « Sweden Laxist policy that brings everyone at risk » (see Interview of Anders Tegnell in Nature, 21 April 2020). Their death rate – as reported by the press - is the highest in Scandinavia (2,941 deaths for 23,918 cases on May 6th 2020), which would be above 12%. However their Chief epidemiologist does not come across like some crazy advisor. The Swedes promoted and counted on personal responsibility and common civic sense. 22 renown swedish scientists openly published a letter criticizing the policy.

Then the Swedes were attacked about lack of mass testings,. But when comparative data are shown, the story looks different. Sweden did as of March 17th 2020, 1,412 tests per 1,000,000 inhabitants. This is higher than Danemark (1,314/Million), than the UK, and than the US (125.4/Million at the same time). In fact, the official policy of the country is focusing its tests for coronavirus on people with a role that is essential to society, such as police, firemen and those who work in care homes for the elderly (see Article in Brussels Times for a critical comment about this). Authorities have shifted their focus away from testing all possible cases, and instead on protecting the most vulnerable groups. People with severe respiratory symptoms or who belong to a risk group will still be tested (see Fact Check article in TheLocalSE).

What is very interesting is that Sweden made this change following the first signs of community infection (cases that could not be linked to overseas travel or previously confirmed cases). This meant that contact tracing would no longer be as effective, since not all cases were accounted for. **This is VERY logical,** once human-human contacts are no longer thought to be the only way to get infected, tracking, identifying them, and building ANY health policy around those human contacts is poorly effective. It is hence logical to best prioritise resources, that the Swedish Public Health Agency shifted its focus on the most seriously ill or at risk people.

Logic aside what can we learn from the Swedish statistics ? As written above, the calculated (wrong) mortality rate is at 12%. But we know from numerous sources that the number of infected persons in the general population is quite high and could vary between 10-30% on average. With a population of 10.23 M inhabitants, Swede would thus count 1,023,000 positive cases (mostly asymptomatic) if we used the very conservative value of 10%. This would translate in a mortality rate of 0.28% - which would compare well with all the values reported so far. It would even be lower at 30%. This is a fair assesment, see here 2 additional interesting articles describing the situation of the asymptomatic infected (see Asymptomatic Coronavirus up to 30% at DW Science, and Bloomberg News 22 March 2020).

Although being attacked, the Chief Epidemiologist is far from being wrong, he just proposed logical measures based on sound Epidemiology, while the rest of the world worked on a set on inaccurate assumptions. The harsh criticism of Sweden highlights that very fact!

- ***France.***
  Applying the same reasoning, when France reports that 5% of its population has been contaminated and uses this as a proof that it is far from collective immunity, they forgot to mention that their actual infected death rate falls at 0.8% !

That the **same values** (for correct mortality rates when calculated as they should) can be obtained with so many different locations, methods, cultural behaviors, and policies, attest of the solidity of those very low mortality rates. Mortality rates on the order of 0.2% – 0.4 % for SARS-2 are real, with some extremes at 0.6%.

How do those rates compare with the seasonal flu and with the pandemic flu?
The seasonal flu – based on total tested cases has comparable and even mostly higher mortality rates. All viruses – once they give pneumonia can give high mortality rates (5% and more)

Quite a lot of **good faith** but misleading information is published based on the **wrong** comparisons. An example is an article in LiveSciences on April 30, 2020 (Reitner, LIfeSCi). This article, very well explained and documented, highlights the flu seasonal mortality rate based on press reports at 0.1%. Then a rate for Covid19 of 6% is mentioned - based on confirmed cases – but only from sick and symptomatic patients. The paper recognizes that problem and mentions that Researchers from Columbia University recently estimated that only 1 in 12 cases of COVID-19 in the U.S. are documented, which they said would translate to an infection fatality rate of about 0.6%. But still concludes – contrary to the available scientific evidence that this would be 6 times higher that the rate for the flu. However it is worth to note that this Coronavirus mortality rate would be consistent with the data obtained from random/large testing. The problem as we will see later is in the estimates that this journalist used for the mortality of the flu.

An in-depth mortality study of the **yearly** flu in the US, reviewed that each year the flu kills between 10,000 and 40,000 people, 60-90 % of those deaths occur above age 65. It is important to note that between half and ¾ of those fatalities are due to pneumonia (see ref. 1-5 in Maletic Neuzil et al. JAMA 1999).

In 2013, a huge review of many studies performed all over the world about the H1N1 virus of 2009, was published (Wong et al. Epidemiology 2009). Assessing strict quality criteria, the authors narrowed the analysis down to 50 large-scale studies. Even so they could report marked differences in mortality rates – that were due to methodological differences. The spread of the mortality rates was between 10 and 10,000 deaths per 100,000 cases. ***Their figure 3 is important***, it clearly shows for all to see that the lower estimates that are usually reported for the flu are linked to studies that used reported 'infection' data or 'symptomatic cases' without even being sure if it was the flu or not. But when the studies used REAL cases based on testing for confirmed cases, the mortality rate per 100,000 cases were on average around and even way above 1000.

This would correspond to a mortality rate of at least 1% and higher for the flu. This would be **above** what SARS-Cov2 shows when the analysis is again based on infected cases conformed by positive tests.

Figure 3 from Wong et al.
Look below on the open blue circles [10 of those are even between 1,000 (1% mortality) and 10,000 (10% mortality!)]. The green and red points – who everyone always mention on the news - are only so low because they are not counting the positive cases of the flu, but the ones that doctors suspect to be the flu, of the ones who are reporting symptoms that may even be linked to other things than the flu. Hence with so much more cases (flus plus others) the actual flu-related mortality becomes apparently lower. The only correct values are the ones in blue, obtained from studies where testing was done to be sure that the infection was well the flu – in in those studies, the figure makes it clear that between 2009 and 2013 the flu REAL mortality was between 1% and 10% in some places.

Arrows to scale, added to compare: Flu (blue arrow) between 1 and 3% (thus between 1,000 and 3,000/100,000), SARS-2 at 0.3% (300/100,000), and SARS-2 in South Korea at 0.03% (lowest estimate, ~ 30/100,000)

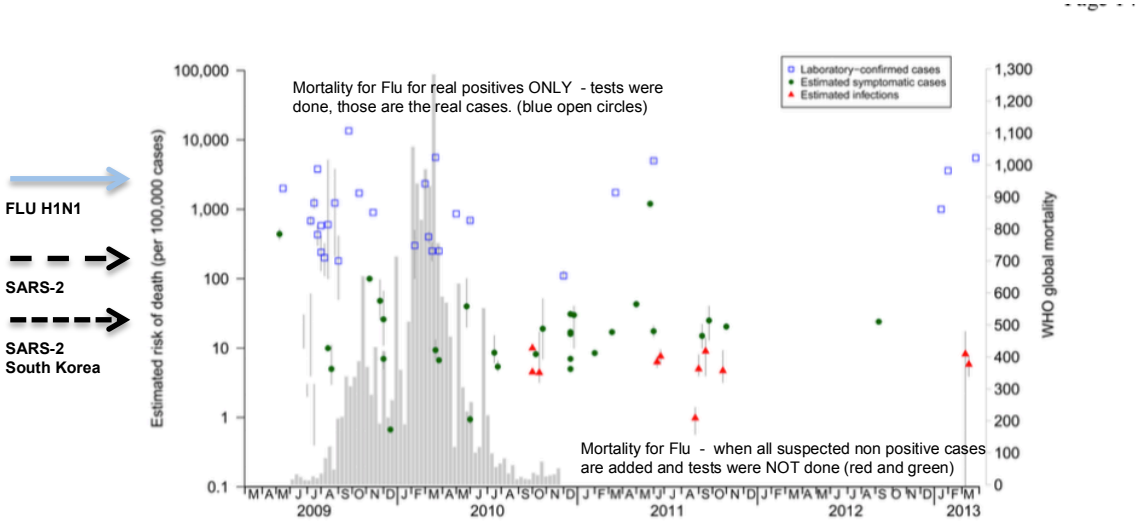

Figure 3.
Estimated risk of death by eventual publication dates of the studies included in the review (points with 95% CI) compared with the histogram of confirmed H1N1pdm09 deaths reported to the World Health Organization (underlying histogram).

In 2020, in a compilation about the mortality and morbidity of the pneumonia given by many different viruses, Z. Mosenifar reported that the seasonal flu gave 40,000 excess deaths per year (See Medscape). The pandemics of 2009 had substantial mortality rates for all. Especially when infected patients have pneumonia, the avian flu (H5N1) has a 59% (!) mortality rate for patients with pneumonia. For the RSV (respiratory syncytial virus) for example, the overall mortality rate is between 0.5-1.7% - thus comparable with the available estimates for the coronavirus. If viral pneumonia came in, this mortality increases up to 5% of the patients with the pneumonia. The situation was identical for ALL the viruses, once they give pneumonia by going deeper in the lungs, the mortality rates are always high.

In conclusion, it is quite striking that good statistical epidemiological practices were not followed.

Is it useful to manage pandemics with some political contest between countries to have or show the lowest infection rates, or the lowest mortality rates (even if wrongly computed)? Is it useful when opinions – not data – are so widespread and shared? If – by doing the right testing right away (random sampling for example) - we had known that the overall mortality rates were so low, would the authorities have decided a lockdown? What are the consequences of stopping ALL Society – part of health care included – for the REAL excess deaths by the virus and by ALL the pathologies and emergencies that went untreated? What was due to the virus, and what was self-inflicted by our behavior?

What about the people who – thinking they were doing the right thing to protect others - spent a few days degrading, then went asleep one evening, with a starting deep pneumonia, only to wake up in need of an ICU? What if this did not even protect anyone?

Now that it is finally understood that testing is the best way to manage this pandemics, it would be a even greater mistake to reserve serological testing ONLY to people at risk or to the sick in the name of "being more efficient". This is the surest way to never get at the reality of what has happened.

Disclaimer:

This note about the need for correct statistics aims at empower rational thinking. It is not meant to attack anyone. It is not perfect, nor does it need to be. Its main use is to educate authorities, medical colleagues, health care workers, and any interested reader.

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