THE OFFICIAL NUMBER OF COVID-19 VICTIMS IS A MANY-FOLD OVERESTIMATION.

The Math-logic Method to Measure the Real Number of Covid-19 Lethal Victims.

The guideline analysis, the U.S. in 2020.

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Abstract

BACKGROUND: What do the data presented in the CDC tables „Deaths involving coronavirus” mean? The one objective information is: „xxx thousands of people have died and being probably infected with Covid-19”. But how many of these people would for sure still live if not Covid-19? The aim of this paper is to present the math-logic method that makes possible to reveal the real number of lethal Covid-19 victims of in the U.S.

METHODS: The ideas for solutions are fully original, mathematical – logical; there were used constructed by us estimators. The calculated data are usually slightly rounded, because the method presentation is the main aim of the article.

FINDINGS: Under 10% of those reported as Covid-19 victims, in the US in 2020, died from Covid-19 complicity and all the rest would have died in the same (or very close to identical) time anyway (also without Covid-19) because their deaths resulted only from the normal age-structure of deaths in the United States, creating the average age of death in the given year.

INTERPRETATION: The official number of Covid-19 victims is in a vast majority “the double counting” of those who would die whatsoever in the same time even without Covid-19. The ‘ex post’ analysis is necessary to discover the real number of deaths due to Covid-19.

FUNDING: None

Introduction

It seems there is no correct essay analyzing the real Covid-19 mortality to find. What do the data presented in the CDC tables „Deaths involving coronavirus” mean? The one objective information is: „xxx thousands of people have died and being probably infected with Covid-19”. But how many of these people would for sure still live if not Covid-19? The main summary reason of deaths is “aging” =advancing age and all diseases (conditions) the frequency and deadly effects of which are very strongly correlated with it (what means, with the overall weakness of the organism); those conditions sources are in the body itself or a condition progress needs much time and advancing age. Next, there are deaths caused by fully external causes like different injuries. Infections have burdening actions (deadly effects are strongly correlated with the overall weakness of the organism /age). Infant mortality is another quite important group of causes of death.

The important point to remember is that the number of chronic conditions and life expectancy are strongly correlated too. The aim of this paper is to show how to calculate the real number of Covid-19 lethal victims.

/Any potential influence of wrong diagnoses (e.g. Covid-19 instead of the flu or other coronaviruses) on the final result is not included in the calculations. Potential harmful effects of unproper (or delayed) treatments of some people infected with Covid-19 are not considered in the analysis either./
Methods

The ideas for solutions are original, mathematical - logical. Some logic guesses had to be resolved. At first it was calculated what the average age of death should be in the same year in a similar group (to the one assumed to be killed by Covid-19) but if nobody was infected. Then, the average further life expectancy for the people from the whole “deaths involving Covid-19” group, if they were still alive, was calculated. The calculations widely used the CDC, NSC and other institutions’ databases, and also Life Table. There were used constructed by us estimators. To understand the procedures of calculations and what the consequences are a reader must follow the resolving and explanations given below. The obtained data are further a bit rounded. In general, the method is in some places slightly simplified to chase calculations, because not all most detailed data were available and because the idea presentation is the main goal of this article, however it cannot meaningfully influence the final result of this analysis.

Detailed Procedure & Results

The average age of those who officially died from Covid-19

No ready data can be found, apart from the rounded median age of 78 in the early data [1]. Could we use the known age ranges and then plot it on a life table? Let’s check it with the average (in a year) age of death in the society. The growing population (with a big role of immigration of younger mobile people) made it very much lower than life expectancy (LE) in the U.S. (LE = 78.75 for 2019 [2]). A number of deaths “speeds up” in an age range, so if we use the age ranges and calculate, based on ‘numbers of lives’ [2], median* ages of those dying in the age ranges and then multiply each median by a subgroup’s volume [3-p.25] (when there are differences then calculate separately for men and women) then we receive the following result:

Medians* for the age ranges: <1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+: 
M: 0.5, 2.4, 11.4, 21.3, 30.40, 40.50, 51, 60.75, 70.65, 80.55, 91
W: 0.5, 2.5, 10.5, 21.2, 30.85, 40.65, 51, 60.80, 70.85, 80.85, 92,05

\[
[10.46 + (4.9 + 4.09) + (36.32 + 24.27) + (463.23 + 170.09) + (1257.07 + 549.96) + (2164.16 + 1201.21) + (5041.2 + 3138.85) + (13846.44 + 8938.33) + (22625.45 + 16671.86) + (28603.31 + 26917.15) + (30773.01 + 49300.23)] /2854.838 (the total number of deaths in the year, in thousands) = 74.17 (years)
\]

But on the site wonder.cdc.gov –’Underlying Cause of Death’ we can get data grouped by ‘Single-Year Ages’ plus choose 2019 and then calculate it to receive 73.77 years. The received 73.77 is not 74.17 by a part because the subgroup-medians are a bit higher than averages, but also due to current demographic processes. …For the purpose of this analysis we take the average theoretical (assuming Covid-19 absence) age of death, in the society in the year 2020, to be 74.0 [it strongly increased from 2018 to 2019 -by 0.5 year (aging of the society), so the next increase should slow down and make up to about 74.0 years [4]. …It is advised to get the most precise estimation/anticipation by a detailed demographic with death rates -study.
The theoretical average age of those forming the official “deaths involving Covid-19” group (DIC) we estimate in a similar way, starting with shares of age-subgroups (the CDC data - early January 2021) plotted on a life table, to receive >76.7 years (based on the medians), the result only by about 0.05 year higher than if to be based on the earlier data of May 2020 [1]. To receive a better approximation it should be next multiplied by 73.77/74.17 to receive >76.3 years. But the shares of the oldest subgroup (85+) are as follows: 31.05% (the DIC group) vs. 31.65% (the normal one in 2019, after deducting deaths due to injuries) [3]. From the comparisons we can see that shares of most of subgroups of the 0-64 age range are lower in the DIC group. But those percentages that are “missing” in the lower age subgroups are not proportionally distributed in older (65++) subgroups; the oldest subgroup (85+) has not increased but a bit decreased share(!) = that subgroup is by about 1.6% underweighted so has very probably a decreased its average age of death.

The estimated negative revision for the whole group is 0.1 year, it is based on the assumption that the difference between the theoretical average age of death in that subgroup [2] and the age of 85 diminishes proportionally to the diminishing share of the subgroup, so in fact the 0.1 value should be the maximal one. But there quite probably are also some hidden disturbances in other older subgroups so to be careful we subjectively deduct >0.1 more to receive the final 76.1 years. …However it would be a help if the needed data was just officially given.

**How many of the US “died from Covid-19” had in real their date of death accelerated**

a) In the beginning we must calculate what the average age of a decedent would be in a group (CTINI) formed from a close to identical, to the one assumed to be killed by Covid-19, group (the official DIC group) if died in 2020 but if nobody was infected and so without Covid-19 related deaths. The already taken, assuming Covid-19 absence, average age of death in the US in the year 2020 (AD) is 74.0 years. But this value needs to be revised upwards due to some factors. Deadly injuries shorten a person’s life and their impact is unique because are not derivatives of already ‘not far from deadly’ health status! Deadly injuries are independent and so exclude the Covid-19 causative participation, thus the average age of death for our group (CTINI) must exclude the impact of injuries in their broad meaning. In the CDC.gov data named “Leading Causes of Deaths” and see there are some groups of causes not directly dependent on aging of the organism.

- Accidents (unintentional injuries): 167127 cases in 2018 // (data for 2019 not available then yet)
- Intentional self-harm (suicides): 48344
- Assaults: 18830

Going deeper into it (data for 2018, imported in January 2021 from the website: [https://injuryfacts.nsc.org](https://injuryfacts.nsc.org)), we can see there are some sub-categories concerning ‘Accidents’, with different age structures of their victims.

- 'Poisoning’ 19.9 per 100,000 (deaths per 100,000 population)
- 'Motor-vehicle crashes’ 12.4 per 100,000
- 'Falls’ 11.2 per 100,000 (before the site revised it to 12.0 in February 2021)
- 'Choking’ 1.6 per 100,000
- 'Drowning’ 1.1 per 100,000
- 'Fires/smoke’ 0.9 per 100,000
- 'Mechanical suffocation’ 0.4 per 100,000

...
We calculate the negative contribution of ‘Poisoning’- (P) to the average age of death (AD) in the following way. The share of all ‘accidental’ deaths in the structure of US deaths is 0.0589 and the share of the ‘Poisoning’ category in ‘accidental’ deaths is 0.37 (0.0589 x 0.37 = 0.0218). We calculate it precisely, using the following estimator [43.5 = the average age of a victim of lethal poisoning (estimate)]:

\[(1 - 0.0218) \times (AD + P) + 0.0218 \times 43.5 = AD\]

\[0.9782 \times 74 + 0.9782 \times P + 0.9483 = 74\]

\[72.3868 + 0.9782 \times P = 73.0517\]

\[P = 0.6649 / 0.9782 = 0.68\]

The ‘Poisoning’ category by about 0.70 y. has its negative impact on the average age of death in the US. The calculations of the influence of the less important categories in the US: ‘Suicides’, ‘Moto-vehicle crashes’ and ‘Assaults’ give for our group: 0.45, 0.40 and 0.25 year respectively. ‘Drowning’, Choking’, ‘Fires’/‘Smoke’ and ‘Mechanical suffocation’ are all trifles and add up together to the additional 0.10 year. There is one important category with the average age of a victim meaningfully higher than the average age of death in the society in the year = ‘Falls’. We estimated (Injuryfacts.nsc.org) the average ‘Falls’ victim age to be 80.0 years. The share of all ‘accidental’ deaths in the structure of the US deaths is 0.0589 and the share of the ‘Falls’ category in all ‘accidental’ deaths is 0.22. So again: 0.0589 x 0.22 = 0.013.

\[(1 - 0.013) \times (AD + F) + 0.013 \times 80.0 = AD\]

\[0.987 \times 74 + 0.987 \times F + 1.04 = 74\]

\[73.038 + 0.987 \times F = 72.96\]

\[F = - 0.078 / 0.987 = - 0.079\]

There are additional minor causes of ‘preventable injuries’ (Accidents) with their total share of 9% in it (Injuryfacts), but their age structures are not given there, so we take 0.10 year as its influence on the average age of death (it can be verified by another source [3–p.40]).

There are also deaths due to injury-like preventable medical errors like drug events, mistakes during operations and postoperative events. But they do not let to make any meaningful revision of the average age of death for our group, because those deaths should not concern otherwise of the standard health status people but those who are mostly old and in a worse, on average, than the age-standard state and so seek for intensive care. Additionally, opinions about their number are extremely different one from another. There could be up to about 50 thousands of such deaths yearly (= but unofficially, if to make use of most extreme and rather loose opinions), but on the other hand there are opinions that the official data are most objective and there are only 5 thousands of deadly ‘complications of medical and surgical care’ yearly [3-p.41], so of an injury-like type there should probably be up to 2 thousands. So we estimate (subjectively) the revision needed due to this factor as from Zero to 0.20 year, and we take 0.1 for the further analysis.

There are still factors that will noticeably revise upwards the average age of death for our group (CTINI), but these factors are associated mainly with the lowest age ranges. We can look at the ‘actuarial life table’ [2]
to see that factors of the lowest age ranges are in a vast majority “consumed” in the 0-1 age range. The negative impact of infant mortality (birth defects, low birth weight, term birth complications and the rest of the causes) on life expectancy is 0.56 year. As it could be expected, the weight of this age sub-group in the “deaths involving Covid-19” group is close to none (over 70 times less than in all deaths in the society [3] = 0.01% vs. 0.73%).

But from the second value we must subtract classical injuries -mainly cases of ‘mechanical suffocation’ (Injuryfacts), not to repeat them. It gives: 0.73 - 0.04 = 0.69%

\[
\begin{align*}
[1 - (0.0069 - 0.0001)] \times (AD + I) + (0.0069 - 0.0001) \times 0.5 &= AD \\
0.9932 \times 74 + 0.9932 \times I + 0.0034 &= 74 \\
73.4968 + 0.9932 \times I &= 73.9966 \\
I &= 0.4998 /0.9932 = 0.5032
\end{align*}
\]

Any further upward adjusting of the expected average age of death for our group is necessary if the deaths-age-structure of the official “deaths involving Covid-19” (DIC) group is further disrupted by deficits of lower-age subgroups’ shares when compared to the normal shares after subtracting deaths due to ‘injuries’ - Those people, who die at age of a lower age range, create this age range negative impact on the average age of death in the year; that impact diminishes with diminishing % of people dying at age of this age range. ...We compared shares of age subgroups of the DIC group (early January 2021) with its normal shares in all deaths in the society [3-p.25]. Then we corrected the second values by deducting all deaths due to ‘injuries’ (Injuryfacts and [3]). Next, we calculated the preliminary values by which the average age of death in our group should additionally be revised upwards.

the 01-14 subgroup shares: 0.02% vs. 0.32% (0.20% after the correction)

\[
\begin{align*}
9.17 /2854.84 \text{ and } (9.17 - 3.82) /2615.80
\end{align*}
\]

the 15-24 subgroup shares: 0.16% vs. 1.04% (0.27% after the correction)

\[
\begin{align*}
29.77 /2854.84 \text{ and } (29.77 - 22.58) /2615.80
\end{align*}
\]

the 25-34 subgroup shares: 0.72% vs. 2.07% (0.81% after the correction)

\[
\begin{align*}
59.18 /2854.84 \text{ and } (59.18 - 38.12) /2615.80
\end{align*}
\]

the 35-44 subgroup shares: 1.92% vs. 2.91% (1.83% after the correction)

\[
\begin{align*}
82.99 /2854.84 \text{ and } (82.99 - 35.19) /2615.80
\end{align*}
\]

the 45-54 subgroup shares: 4.97% vs. 5.62% (4.85% after the correction)

\[
\begin{align*}
160.39 /2854.84 \text{ and } (160.39 - 33.58) /2615.80
\end{align*}
\]

the 55-64 subgroup shares: 12.20% vs. 13.13% (13.00% after the correction)

\[
\begin{align*}
374.94 /2854.84 \text{ and } (374.94 - 34.69) /2615.80
\end{align*}
\]

the 65-74 subgroup shares: 21.70% vs. 19.46% (20.38% after the correction)

the 75-84 subgroup shares: 27.24% vs. 24.10% (25.48% after the correction)

There are considerable share-differences in the 01-14 and 15-24 subgroups, but next happen only delicate ones. Deaths due to congenital anomalies have 5%-share in the 1–19 age range and conditions (mainly cancer and heart diseases) play a very small role [5].
Those preliminary revisions due to deficits of subgroups’ shares are precisely calculated in the following way (the example for the 15-24 subgroup):

\[
[1 - (0.0027 - 0.0016)] x (75.75 + S) + (0.0027 - 0.0016) x 20.85 = 75.75
0.9989 x (75.75 + S) + 0.0229 = 75.75
75.6667 + 0.9989 x S = 75.7271
S = 0.0604 /0.9989 = 0.0605
\]

\( /75.75 = \) the average age of death (in 2019) after deducting the negative impact of ‘injuries’; 20.85 = the theoretical average age of death in the subgroup (= the median minus about 0.4)/

If some percentages are missing in lower subgroups then it means they are next distributed in higher-age subgroups. For example the total deficit in the 0-24 age-range is: 0.72 + 0.18 + 0.11 = 1.01%, so the next share of 0.72% (the 25-34 subgroup) we should compare (when calculating the next revision) not with 0.81% on the right side, but with: 0.81 / (1 - 0.0101) = 0.82% …and further we compare 1.92% not with 1.83% on the right side, but with 1.85%; etc.

The sum of preliminary revisions (PR) due to changed shares within the 1 - 64 age-range is:

\[0.1256 + 0.0605 + 0.0455 - 0.0245 - 0.017 + 0.1478 = 0.3379\]

The total sum of PR (for the 0 – 64 age-range) additionally includes the revision due to ‘infant mortality’ (which is by a big part similar to ‘injuries’):

\[0.5032 + 0.3379 = 0.8411\]

…What about the 65++ age-range is explained on the next page.

But what matters is the sum of final revisions! Shares of lower-age subgroups in deaths can be a bit lower in the “deaths involving Covid-19” (DIC) group than in the society also due to medical staffs’ discretion. But the factor of genuine ‘Covid-19 deaths’, lowering the average age of death in the DIC group, is superimposed what produces the downwards (age) directed pressure, so we should next eliminate the effect of this factor on the revision for the CTINI group. - If not that decreased average age of death then the deficits of shares of lower age-subgroups could be yet bigger and so the revisions should be yet higher. To calculate the pure impact (the sum of final revisions) of deficits of age-subgroups on the CTINI group we must adjust the average age of death in the DIC group to the higher value of: ‘75.95 plus the sum of final revisions itself’, quite a good approximation here is ‘75.95 plus the preliminary sum of revisions’ (75.95 = 74 + 1.95; 1.95 - the impact of injuries, please check the next page). Initial shares of the very lowest subgroups are expected/assumed (with the adjusting) to keep proportions with shares of the following subgroups of the 01-64 age range (what means we initially assume that shares of real Covid-19 deaths are similar in different age-ranges). Those shares we recalculate/diminish in the way: \(S \times 76.10 / (75.95 + 0.84)\). Theoretically, we should recalculate this way all shares of the 0-84 age range; but the last and open summary range (85++), which means “the rest” = ‘100% minus the sum of all previous shares’, receives an increased adjusted share and its average decedent-age goes up as well. …It gives the following shares:

\[0.02\%, 0.16\%, 0.71\%, 1.90\%, 4.93\%, 12.09\% \text{ (within the 01 - 64 age range).}\]
Then when calculating the sum of “final” revisions we must also make the correction (the simplified way is: ‘x 75.75 /75.95’) due to the fact that we take (for 2020) the increased, by 0.2 year, average age of death. The total sum of recalculated revisions a bit depends on what causes deficits to finish before the 65+ age range. We finally take the upper 0.85 because of the 65+ age range*.

/*The deficits finish before the 65+ age range and so the increased shares of the older subgroups could be purely the result of genuine Covid-19 deaths as well. If they were not, then continuing revisions (starting with calculating the sum of preliminary revisions), to the very end, gives the final rounded up result = 0.80. But if the increased shares (within the 65+ range) were purely the result of genuine Covid-19 deaths then to cease that overweight (21.70% vs. 20.77% and 27.24% vs. 25.97% - the shares on the right side are recalculated in a similar way as explained on the previous page) we should diminish these shares (with the adjusting) much more than proportionally [‘S x 76.10 /(75.95 + 0.84 + X)’] at the cost of changes (ceasing it) of the shares of the lower-age subgroups and so the preliminary 0.84 value would change only slightly downwards; 0.80 would be just (minimally) closer than 0.85 but we take the upper 0.85 as there could exist imperfections in keeping proportions between the initial shares of lower age-subgroups.*/

/*Injury-like preventable medical errors are not included in the above calculations because their precise age-structure is unknown and their effect is very small (unsure).*/

[If we had a huge subgroup of decedents (in the given year) and its age-structure was close to identical to that of all deaths (after eliminating reasons of death other than “aging”) and the subgroup was (before all deaths) of the standard age-state-of-health then no new killing factor could be common exclusively in that subgroup; any new and common killer should have considerably diminished the average age of death! Covid-19 cannot omit the rest and choose to infect and kill stronger/strongest ones and by this way to show a similar shares of decedent-age-subgroups, and so we cannot say that e.g. a statistical 70-year-old already decedent would otherwise live, on average, yet longer if was additionally infected with Covid-19. To fully understand the question please continue reading through the parts -b- and -c-.]

…Thus, the total value of the upwards adjusting for our group (CTINI) is:

(0.70 + 0.45 + 0.40 + 0.25 + 0.10 - 0.10 + 0.10)** + 0.10** + 0.85 = 2.90 year

/*the summary value above is revised up by 0.05 because finally available data for 2019 show the number of injury-deaths increased by some %; **assessed subjectively*/

So: 74.0 + 2.90 = 76.90 year

……

However, there is also one factor that in turn could force the average age of death (for the CTINI group) to be adjusted downwards. This is the state of health factor.

The share of people without a chronic condition drops to its minimum at age 75, and next, at age 85 this share is the same (not falling more), according to the Canadian data (CIHI.ca 2011). There are studies [6,7] according to which people who do not abuse alcohol +do not smoke +are physically active +eat healthy live on average 9-10 years longer than the US average is, being free, in a majority, of chronic conditions. A similar effect was signaled in other developed countries [8,9]. …The CDC revised the average number of underlying conditions to 4.0 for 94% with conditions in the ‘deaths involving Covid-19 group. But heterogeneity in included in different observations conditions means that the real number must be, in fact, yet something higher. The number of conditions and life expectancy are strongly correlated -please read the Discussion part!
However our previous assumptions must be revised. The small % of condition-free ones in the ‘deaths involving Covid-19’ group should have been, by a very big part, the result of the usual taking now into account conditions like hypertension and obesity which are at present very common in the U.S. [10,11,12]; especially the prevalence of hypertension (not yet on the 2008-CCW list) is record-high amongst older people. Additionally, in fact, people with 0 conditions have life expectancy, on average, only by very little bigger than people with 1 condition [13]. ...But what should the average number of conditions be in the U.S. society-cluster with the same age-structure (the comparative group)? That number could not be noticeably smaller (and so the average health status could not be better) in the “deaths involving Covid-19” group than in the comparative group because that group is really huge and Covid-19 cannot selectively infect (and then kill) persons with lower numbers of conditions (= healthier). However this number could/should be bigger due to killing by Covid-19 more often weaker ones of already infected persons. If a person has a few conditions (of the Chronic Condition Warehouse list) then what matters much for life expectancy is that pure number of conditions [13].

The potentially increased, by a limited value, average number of 2008-CCW-conditions (3.5 vs. 3.0, if a bit lowered 3.0 was the norm for the comparative group) would have less negative effect on life expectancy to having the same initial and then the same increased number by everyone (the theoretical 3.5, because practically a person cannot have 3.5 conditions but 3 or 4), in the proportion 8.5 to 10 here (rough estimate on the basis of ‘Table 1’ and ‘Table 2’ [13]). We can try to process and extrapolate data from the tables, with the help of a life table, to estimate what time to deduct from an average age of death for a statistical 59-year-old individual if he then lived with the conditions (3.5+) for 24 years, and the time to deduct from an average age of death for a statistical 67-year-old individual, if he then lived with the higher number of conditions for 19 years, is 1.1 year [13]. According to the British data guideline [14] the crude %-increase in multimorbid patients is stable from age 55 till 85 years and next the %-increase slows down. At the same time, in the U.S., the prevalence of 2+, 3+ and 4+ chronic conditions (not fully of 2008-CCW but the key proportions are similar) in a group of an average age of 55 (45-65) is already approximately: 77%, 62% and 47%, respectively, of that at age 65+ according to another guideline [15]. Additionally, percentages for the U.K. are lower and the prevalence of 2+ conditions in the first study resemble more the prevalence of (3-4)+ conditions in the second study-guideline (the U.S.). We concentrate on 4+ conditioned, because the lower summary values are always much ahead and 3 is rather neutral here, and initially on the average age of a potential victim of Covid-19 to correct the result for our group (CTINI) next (D); the estimated average age in the 65+ subgroup is 75.1 years in the U.S. society [16].

\[
0.47 \times \frac{(75.1 - 55)}{(76.1 - 55)} + \left\{1 - 0.47 \times \frac{(75.1 - 55)}{(76.1 - 55)}\right\} \times \frac{4}{(76.1 - 55)} = 0.5525
\]

\[
0.5525 \times \frac{(76.1 - 59)}{24} \times 1.45 + 0.4475 \times \frac{(67 - 59)}{(76.1 - 59)} \times \frac{(76.1 - 67)}{19} \times 1.10 +
+ 0.2382 \times \frac{(76.1 - 67)}{19} \times 1.10 \times 0.5 \times = 0.5708 + 0.1103 + 0.0627 = 0.7438
\]

\[
0.7438 \times 0.85 = 0.6322 \text{ (year) = D1}
\]

/*We assume in the example that in the end (just before the death) virtually all of the DIC group had the average number of conditions (ANC) increased; but at an average age of 67: (1 - 0.4678) x 0.4475 = 0.2382 = 23.82% of the group sill had not. The remaining percentage is already limited so we can yet simplify the calculations =if all of the subgroup would suddenly
get the increased ANC its effect would be: 0.2382 x (9.1 /19) x 1.10, on the other hand if all got the increased ANC only at age, on average, 76.1 then its effect would be close to Zero, so the middle value is: 0.2382 x (9.1 /19) x 1.10 x 0.5.

/D1 – the approximate value by which the exemplary increased number of CCW-conditions should have diminished the average age of death (to 76.1 y.) in the “deaths involving Covid-19” group/

The so far result for our group (CTINI) is 76.90 years what means our group would have only slightly more time for chronic conditions to show their negative effect [76.90 > 76.10 + 0.63] and so the final result should be minimally higher (about 0.64)

/The above value is the result from our example. The estimator is simplified and gives approximate values because is based on some minor assumptions (due to the lack of some more precise data). It is also based on 21 conditions of the 2008-CCW list so in fact describes the negative influence on the average age of death of increasing the average number of conditions from >3.0 to >3.5, by >0.5 (could be closer to 1.0 as there are meaningfully more conditions than of the 2008-CCW list)/

b) Since people from the “deaths involving Covid-19” group were allegedly killed by Covid-19 (accelerated deaths), it means that without its ‘intervention’ these people should still live. Thus, we calculate the average further life expectancy for the people from the whole DIC group if they were alive. We plot their age-of-death structure plus shares of women and men on the ‘actuarial Life Table’ [2]. Initially we base on median values from age-subgroups and then taking into account weights of those age-subgroups we calculate the initial result for the whole group. The very careful calculations give the result of 12.25 year, but it must be then adjusted up because the average age of death, for the DIC group, was adjusted down from >76.7 to 76.1 -what gives 12.70 year; and has also to be revised upwards because our group consists of those who could not die (if to be included into the group) because of fully external causes. For each mentioned category we must calculate the still existing, after forming by the deceased the “deaths involving Covid-19” group, potential length-of-life diminishing effect (X).

However, weights of age-subgroups of the DIC group must be first converted as a medium age an injury could act on a person from the DIC group is, on average, his/her actual age plus half of a difference between life expectancy and that actual age. Simplified average LEs for subgroups [2] and its average age plus half of the difference (= medium ages a fatal injury could act) are:

- the 01-14 subgroup = 71.3 and 43.7
- the 15-24 subgroup = 59.6 and 49.8
- the 25-34 subgroup = 50.1 and 55.0
- the 35-44 subgroup = 40.8 and 60.4
- the 45-54 subgroup = 31.8 and 65.9
- the 55-64 subgroup = 23.4 and 71.7
- the 65-74 subgroup = 15.8 and 77.9
- the 75-84 subgroup = 9.4 and 84.7
- the 85++ subgroup = 6.5 and 88.3

We can see that persons from a major/older age-subgroup of the 55-74 age-range usually fall into a neighbor-subgroup, those of the 75++ age-range move down in a majority within the same age-subgroup and only
those from a subgroup of the 01-54 age-range (which have small shares in the DIC group) make considerable moves down; so we can receive, with converted numbers/weights, good estimations from the equation below.

For example, there are people in the DIC group at age 45-75 which could otherwise be important in number victims of lethal ‘Poisoning’. The estimate is the sum of the partial values (Xn) for different age ranges (including 75++ too):

\[
\begin{align*}
1.0 \times [LE + Xn \times (Sn /SN) / (Cn /CN)] - 0.023 \times (Pn /PN) \times LEn &= LE \\
Xn \times (Sn /SN) / (Cn /CN) &= 0.023 \times (Pn /PN) \times LEn \\
Xn &= LEn \times 0.023 \times (Pn /PN) \times (Cn /CN) / (Sn /SN)
\end{align*}
\]

Xn - the potential length of life diminishing effect for an 'n' age-range in the “deaths involving Covid-19” (DIC) group
Pn - the number of Poisoning victims in an ‘n’ age range,
Cn - the number of Poisoning victims in a corresponding ‘n’ age range; SN – the whole DIC group size.
LEn - life expectancy (average) of a victim from an ‘n’ age range or at least life expectancy at its average age

\[
LE = 0.023 \times (Pn /PN) \times (Cn /CN) / (Sn /SN)
\]

We should repeat the calculations with every of the mentioned (in the –a- part) categories and then sum all up. All needed data concerning age ranges of victims of different types of injury are in tables and charts on https://injuryfacts.nsc.org also [3]. …The estimations gave us the final summary result of 0.55 year.

If there was any ‘D value’ (please go back to the end of the -a- part) we would have to calculate:

\[
(76.90 - D) / 76.90 = R
\]

\[
(76.10 + 12.70 + 0.55) \times R - 76.10 = ALE
\]

/ALE – adjusted life expectancy, assuming keeping the health-proportion/
/If 'D' meant increasing the average age of death then we would have to add it to 76.90/

Because there were millions of infected ones and then the formed of them “deaths involving Covid-19” group is still huge (size =363 thousands) the health status of persons soon forming the DIC group (just before they got infected), could have been, on average, only:

a) very similar to …or

b) worse than that of the comparative group

/The comparative group is the U.S. society-cluster with the same (as of the DIC group) age-structure and of the standard, with this structure, health status./

…Let’s assume (for a while) the D value to be Zero (it means we assume, for a while, the health status of persons soon forming the “deaths involving Covid-19” to be, on average, identical to that of the comparative group), so we take the value of 12.70 + 0.55 = 13.25 years for the further analysis. …But why, for example, for the age of 76 a still alive person should live, on average, for over 11 more years (‘life table’)? Because some people die being (much) younger, and a person aged 76 is the one who is lucky to still live. Those who died
much younger lower the average ‘length of life’ and the still living will increase it. The average ‘length of life’ and the average ‘summary length of life expected at a given age’ are equal only at birth.

e) What are the conclusions so far and what next?

- If 100% of people of the official DIC group died in 2020 due to “aging”, that is if there were no real deaths caused by Covid-19 in that group, the average age of death in that group would be 76.90 years. …The worst state of health is not any age but it is only strongly (with advancing age) correlated. Some people have their worst health status (pre-deadly/deadly) at age 90 or more while at the same time some people have their worst possible health status at age 60 or less. Real Covid-19 deaths can only make people die yet earlier/younger, regardless of whether one would otherwise die at age 95 or 60.

- At the same time, if Covid-19 killed all persons of the official “deaths involving Covid-19” group then it would mean that without the virus ‘intervention’ all of them should be still alive, for the next 13.25* years on average! It would also mean that each individual genuine Covid-19 related death shortened its victim personal life, on average, by 13.25 years.

^with our temporary assumption of the health status of persons soon forming the DIC group (just before they got infected) to be, on average, identical (or just very similar) to that of the comparative group/

/It is nonsensical to believe that Covid-19 selectively infects and kills at quite typical for people to die ages (= with a very similar to normal age-structure of deaths) only strong ones, who would otherwise live to an average age of 89.35 years (?)

…what would additionally mean than Covid-19 is unable to kill (accelerate deaths of) people otherwise expected to live as long as the average (after eliminating reasons of death other than “aging”) in the U.S. is, nor those that are the weakest ones (in the sense that their lives are much shorter than the average in the U.S. is). /

- Persons from the ‘deaths involving Covid-19’ group died at an average age of about 76.10 not of 76.90, so there is the 0.80-year loophole (if to take exactly 76.10 and 76.90) caused probably by lethal effects of Covid-19.

…The average expected approximate contribution of a single individual genuine Covid-19 related death to the size of this gap is as follows:

\[
[13.25 - (AAADP - ADC)*] \times \frac{1}{N}
\]

"N" is the size of the entire group = 363,000/

^Each genuine Covid-19 death shortened its victim life, on average, by 13.25 years (in a variant with the standard health status); but it should not be related to the average age of death in the given 2020 year for the CTINI group (ADC), as it must be related to the expected and adjusted (by eliminating reasons of death other than “aging”) average ‘length of life’ of those people at all (AAADP), so not in any given year. The ADC is lower than AAADP due to the immigration of younger people and other demographic processes (the growing population) and because e.g. the deduction of ‘falls’ decreases ADC, but increases AAADP (the total increase due to eliminating reasons of death other than ‘aging’ is distinctly smaller in ADC).

LEWIIfmS (used next) means at-birth life expectancy = 78.75 [2] but next without negative impacts of injuries and infant mortality (calculated below) and additionally diminished by one of elements plus increased by he other one (both are described just below), and also corrected by taking into account the shares of sexes (= minus 0.25 year) -as there were 55% men in the DIC group. LEWIIfmS is a close approximation of AAADP:

- Looking historically (the U.S.) at-birth LE reached 70 years in 1962, reached 75 years in 1989 and reached the result as high as 78 years already in 2007 [17]. After 1960, the largest increase in LE occurred between 1970 and 1980, it is attributed to decrease in cardiovascular mortality and infectious diseases, and to the effectiveness
of prevention programs related to smoking, alcohol consumption and promotion of physical activity [18; the CDC]. However decedents of the DIC group had been lucky and none of them had died much earlier so any worse in the past (as LE has been smaller but growing) medical or environmental factor (e.g. cardiovascular disease, infection, smoking) did not kill them! But it is known that e.g. even very past tabaco smoking has some actual negative effect, so worse environmental or behavioral factors or worse than actual medical treatment, even if acted on persons many years ago, should have at least a limited/small negative effect on expected total ‘lengths of life’ of actually mostly old people too (and that is the only possible way these factors could still act on the DIC group). We subjectively take the influence of this factor (’f’) as 0.5 year (it will be explained more later in the text). …The second additional element is an equivalent of “missed risks” (the deficits of shares in lower age-subgroups); it will be considered at the bottom of this page.

The negative impacts of different injuries on the average at-birth life expectancy we can count with the estimator (the example for ‘Poisoning’):

\[
1.0 \times (78.75 + P) - 0.023 \times LEa = 78.75
\]
\[
78.75 + P - 0.023 \times 37.54 = 78.75
\]
\[
P = 0.023 \times 37.54 = 0.8634
\]

/*The imputed 0.023 value in the above estimator assumes that the percent of people dying in the given year (2019) from an injury (‘Poisoning’ in this example) [3] is similar to the percent of people dying at all from this injury. The difference would be very small and the assumption saves much of our time; this assumption (very) slightly overestimates the values what means that slightly overestimates the final result too, what can be seen from final equations.*/

/*LEa -life expectancy at age 43.5 years (43.5 = the average age of a victim of lethal poisoning)*/

All the results are (the order the same like in the -a- part):
\[
0.85 + 0.55 + 0.45 + 0.3 + 0.2 + 0.1 + 0.15 + 0.15** = 2.75
\]

The negative impact of infant mortality on the average at-birth life expectancy is 0.56 year [2]. Without injuries (not to repeat them): 0.56 x 69 /73 = 0.53. It can be additionally corrected down as in the DIC group there is the symbolic 0.01% share of the 0.0 - 1.0 age-subgroup, and then: 0.53 x (69 - 1) /69 = 0.52(2)

Now the second element signaled upper on the page. The final equation would be (the 25-34 subgroup’ example):

\[
1.0 \times (LEWIIf + Sn) - (A - B) \times 49.70* = LEWIIf
\]

/*Sn – the revision for the age-range; A – adjusted share from a life table; B – adjusted against LE share of the DIC subgroup*/

/*49.70 – average life expectancy for this age-subgroup, adjusted for shares of sexes in the DIC subgroup*/

The expected summary value is small when receiving ‘A’ and ‘B’ values for all subgroups very time-consuming and complicated. So let’s do it much easier - the value of: 74.00 + 1.95 + 0.10 + 0.50 = 76.55 (the average age of death, in the year, with excluded injury-like events and infant mortality) …corresponds with LEWIIf = 78.75 + 2.75 + 0.53 - 0.5 = 81.53, …thus the value of: 74.00 + 1.95 + 0.10 + 0.50 + 0.35 = 76.90 should more or less correspond with: 81.53 x (76.90/76.55) = 81.90, …and 81.90 - 81.53 = 0.37; …thus ‘m’ = 0.37
Thus we can estimate the average contribution of a single genuine Covid-19 related death to the 0.8-year gap:

\[
[13.25 - \text{(LEWHfM} - 76.90)]] \times 1 /N = [13.25 - (81.65* - 76.90)] \times 1 /N = 8.50 \times 1 /N
\]

The total Covid-19 contribution to the size of the gap cannot be more than the gap itself is. Let’s count exactly:

\[
C \times 8.50 /N = 0.80
\]

\[/'C' \text{ is the number of real/genuine Covid-19 related deaths, in thousands/}
\]

\[
C = 0.8 \times (N /8.50) = 34.16
\]

\[
C /N = 0.8 /8.5 = 0.094 (= 9.4\%)
\]

\[/'C'/N' \text{–the share of real Covid-19 related deaths in the “deaths involving Covid-19” group in the U.S.}/
\]

\[*/\text{If the first element (described on the previous page), which is difficult to quickly assess it precisely (to assess precisely+ it needs a separate time-consuming analysis), turns out to be of more than assumed only 0.5 year effect, then the final %–result will only drop, but not much, e.g. to 8.9% if to increase the deduction even by as much as 0.5 year more.}
\]

\[
[13.25 - (81.65 - 0.5 - 76.9)] \times 1 /N = 9.0 \times 1 /N
\]

\[
C = 0.8 \times (N /9.0) = 32.27
\]

\[
C/N = 0.8 /9.0 = 0.0889 (= 8.9\%)
\]

Thus, if the health status of persons soon forming the “deaths involving Covid-19” group was, on average, identical to that of the comparative group then only about 10% of those of the official DIC group died from Covid-19 complicity and all the rest were already in their terminal states and would have died in the same (or close to identical*) time anyway, also without the Covid-19 infection, because their deaths resulted only from the normal age structure of deaths in the United States and from causes/conditions already existing before Covid-19, creating the actual average age of death. [*It is however possible, strictly conditionally, that some of the rest (of >90%) had their deaths earlier by a number of days (or weeks); but this number must be (on average) very low if not to result in a noticeable overstatment influence, already incorporated in the just calculated number of deaths, visible in the yearly statistics. This number is the maximal one (34.16 thousands here) with the assumption of any part of those 90% not having their deaths earlier at all –it can be explained more on request (= the factor of “skips” of some death-dates just through the border between the years, from 2021 to 2020, producing a hidden, although limited, overestimate of the result).]

……

But what would the result be if the health status (before being infected) of people soon forming the “deaths involving Covid-19” group was meaningfully worse (the average number of conditions was bigger) than that of the comparative group, with the same age-structure? If the average number of conditions (of the CCW list) was higher by >0.5 then the average age of death in the CTINI group, according to the example in the end of the -a- part, would not be 76.9 but about (76.9 - 0.64) = 76.26 years; then ‘the loophole’ (76.26 - 76.1) would be only like 0.16 year.

\[
(76.9 - 0.64) /76.9 = R = 0.9917
\]

\[
(76.10 + 13.25) \times 0.9917 - 76.10 = ALE = 12.508
\]

\[
12.508 - (81.65 \times 0.9917 - 76.26) = 7.7957
\]

\[
C = 0.16 \times (N /7.80) = 7.446
\]

\[
C /N = 0.16 /7.80 = 0.0205 (= 2.05\%)
\]
So if the average state of health of persons soon forming the DIC group* was meaningfully worse than that of the comparative group then with their(*) very high average age of death (76.1 years) the share of real Covid-19 related deaths would be only yet (dramatically) lower! But what if only a limited % of the group (let’s say 10 %) has hugely increased its average number of conditions (ANC), e.g. by 5 of the 2008-CCW ones to reach 8, on average, in that subgroup, and if including the whole list of conditions then to meaningfully exceed 10, on average; would there be a big change to the ‘D value’ with assumed a much smaller increase (by 0.5 of 2008-CCW here) but evenly dispersed virtually within the whole group? Not at all. We can estimate with the tables [13] to see that the ‘D value’ would be yet higher, but slightly, with the ratio of <1.1 to 1.0. *

…But any so low (a bit over zero) result is only a theoretical (unrealistic) one; we think (being based on our previous tries of estimating the ANC in the comparative group, and because the result of <10% is already very small (when yet considerably smaller values could have to mean people in that subgroup of genuine Covid-19 deaths having, on average, tens of underlying conditions each **) that the health status of both groups was more like similar one to the other and thus the result like 9% is meaningfully closer to the reality (but not quite reachable as rising multimorbidity is correlated with diminishing life expectancy, the same like an advancing age is). …From the work of DuGoff EH et al. we know that if a person has a few conditions of the CCW list then what matters much for life expectancy is their pure number; the leading causes of chronic disease death give some differences in life expectancy at age 67, but the differences considerably diminish with morbidity and/or with increasing age [13]

*/,** if to assume e.g. only 20% of the DIC group having its average age of death lower (to increase ‘the loophole’ in the subgroup), the average age of death in that subgroup would have to be only: AD = (76.1 - 0.8 x 76.9) / 0.2 = 72.9, ‘the loophole’ in the subgroup rises to: 76.9 - 72.9 = 4.0, ALE to 15.50, so C = 4.0 x (N x 0.2 / 0.6) = 27.40, and we receive the final result for the whole DIC group 7.5% instead of 9.4%; …if to additionally assume the exemplary increased average number of conditions to be the result of its increase in the 20-% subgroup, we get the ‘D value’ for the subgroup 3.4, then ‘the loophole’ for the subgroup: (76.9 - 3.4) - 72.9 = 0.6 year

(72.9 + 15.5) x 0.9551 - 72.9 = ALE = 11.531
11.531 - [81.65 x 0.9551 - (76.9 - 3.4)] = 7.047
C = 0.6 x (N x 0.2 / 7.05) = 6.179
C / N = 0.017 (= 1.7%) …instead of 2.05%

…So the given previously results do not grow when selecting out subgroups./

/It can be added that the 10-years-average age of supposed flu victims is by about 4 years lower than of Covid-19 (the CDC tables)./ 

**The intrinsic loop**

Some of patients with other diseases are not provided with immediate help because access to treatment for the diseases that most contribute to deaths (cardiology, oncology and lung diseases) has worsened by much with the pandemic in a number of countries. Some of hospital clinics have been closed due to revealed Covid-19 outbreaks. There are also people who are afraid of going to a specialist or to the hospital because of their apprehension of becoming Covid-19 infected there (panic). Covering the face with a mask enables the creation of a dangerous concentration of microorganisms and a statistical mask user probably do not change it often enough to limit that problem; besides, masks decrease O2- and increase CO2- concentrations under it. Staying at home means limited physical activity what is negative for overall health. When a number of people
die because of these reasons earlier than they otherwise would they reduce the average age of death which should be used in an analysis like this one. These factors role will be growing over time in next years.

**Influenza and Pneumonia**

The flu reported numbers of cases, even up to 90-95%, diminished in the world in the year 2020. That fact was already visible in the very beginning of the Covid-19 appearance [19]. Maybe a number of the flu cases were treated as Covid-19 in that year due to limited reliability of the tests, or maybe there is another explanation. Comparative joint counting of Covid-19, influenza and pneumonia-without-Covid-19 lethal cases is necessary because when looking at the CDC data: “Deaths involving coronavirus disease” we can see that virtually all cases of “Deaths involving Covid-19 and Pneumonia” were further claimed to be Covid-19 lethal victims. Also, in the UK when influenza, pneumonia and Covid-19 were on a Medical Certificate Cause of Death (MCCD) together, without a postmortem, then almost 96% of these deaths were counted as Covid-19 deaths, according to the analysis [20].

**Discussion**

In the U.S., over 62%, about 48%, 34%, 23% and 15% of persons aged 67+ have, respectively, 3+, 4+, 5+, 6+ and seven or more conditions of the CCW list (of included in 2008), and only >2% have ten or more [13]. But the prevalence of 2+, 3+ and 4+ chronic conditions is approximately: 2.4 times, five times and close to ten times, respectively, greater at age 65+ than at age 20-44; at the same time, when comparing to a group of 45-64 years of age, this prevalence is approximately 1.3, 1.6 and 2.1 times, respectively, greater at age over 65 [15].

Some useful info adds the rand.org study: “Multiple Chronic Conditions in the United States” also [21].

The number of chronic conditions and life expectancy are very strongly correlated; the average number of chronic conditions would have to be ≥ 10.0 ! (of 2008-CCW ones) to diminish life expectancy to 80 years for a still alive 75-year-old US woman, what means shortening the remaining life to five years; at the same time a 75-year-old woman with “only” 5.0 chronic conditions should live, on average, to the age of 87, what is by one year shorter than the average for a 75-year-old woman in the US [13]. The marginal decline in life expectancy increases with an additional chronic condition when the number of conditions is low, but this decline starts with low values -first conditions sum up to a much less effect on life expectancy than the next conditions do; at the same time the leading causes of chronic disease death give some differences in life expectancy at age 67, but the differences considerably diminish with morbidity and/or with increasing age [13]! The clear relationship between the number of comorbidities and life expectancy has been discovered also by other authors [22].

...It is now said that Covid-19 can cause even acute strokes and acute myocardial infarctions himself [e.g. 23,24]. What concerns different possibly mortal chronic conditions, most of them have a similar very advanced average age of a decedent; that age is considerably lower only due to the conditions: HIV (<60 y.), malignant neoplasm of cervix uteri (-60- y.), obesity and chronic liver diseases (>60 y.) [3-p.39-40].

The limited average number of conditions in the “deaths involving Covid-19” group does not support the theory that this group was of a meaningfully worse than standard health status. Additionally, further selective increase
in the average number of chronic conditions could only diminish the share of real Covid-19 deaths in the officially announced ‘Covid-19 related deaths’ because ‘the loophole’ would collapse by far faster than life expectancy!

If a person dies with Covid-19 in no way it means that Covid-19 kills him. Assuming in advance that a person is a victim of Covid-19 only because has died with Covid-19 (or even sometimes only with a positive PCR test result) is horribly irrational; it is worthless and almost as senseless as saying that if someone wearing glasses died then wearing glasses killed him.

Conclusions

a) The ‘ex post’ analysis is necessary to discover the real number of deaths due to Covid-19.
b) The official number of ‘Covid-19 deaths’ is mainly the result of the double counting of those who would die whatsoever in the same (or very close to identical) time, also without the Covid-19 infection, because Covid-19 started to accompany people already being in their terminal states …or where there was not any Covid-19 but only positive PCR test results. So in the US in the year 2020 there were not 363,000 ‘deaths involving Covid-19’ but only up to a bit over 30,000 of that. The rest of the deaths should be treated as wrongly attributed to Covid-19.
c) Very little excessive deaths year-over-year can be due to Covid-19. Main reasons of excessive deaths most likely are:
  -some of patients’ fear of going to a specialist or to the hospital (panic)
  -the worsened access to treatment for diseases other than Covid-19
  -‘deaths of despair’.
d) It can be supposed that one of reasons of the official numbers of ‘Covid-19 deaths’ being hugely overestimated is including those who have had only a positive PCR test result (1-2 months prior to the death, like in the US or in the UK); …but including only those with symptoms would not change much.
e) Comparative joint counting of Covid-19 + influenza + pneumonia-without-Covid-19 lethal cases is necessary.
f) Covid-19 in 2020 (taking into account the simultaneous very strong disappearance of the flu) made itself no meaningful [it is even possible that none] net increase in the number of yearly deaths. So at the same time it means that disappearing of Covid-19 should not have a meaningful diminishing effect on the number of yearly deaths (+ the flu should then recover).
g) The analysis for the year 2020 is most informative. Later analyses can, in fact, incorporate also health troubles produced rather by the vaccines -by their direct and indirect (e.g. impairing of the immune system) actions, and effects of mutations of Covid-19 –if forced by the vaccines.

Conflict Of Interest

There is no conflict of interest.
Notes

1) The estimator from the end of the -a- part is simplified. If an estimator is difficult to understand then please ask the authors to explain it.
2) The new CDC document appeared [25]. We do not use it because it does not look much credible. The number of “Covid-19 related deaths” was revised up to 378 th. (compared to the data from very early January 2021 -363 th.), but the estimated average age of a decedent went meaningfully up. It would be only possible if those added 15 th. died at age almost 90 on average. Also, the CDC gives a much increased number of all deaths in the society (2020 vs. 2019) and the decreased average age of death. If the data were real it would mean that the ‘intrinsic loop’ and ‘deaths of despair’ killed additional >450 thousands of people in 2020. But we think that preliminary data are by a big part the result of simple adding in an unwise way.

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4) https://www.census.gov/topics/population.html
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