

15.12.2020

Summary of Swiss Medical Board feasibility assessment for project:

Translation of COVID-19 outcomes for the public to facilitate informed advanced care planning

Introduction

After the world was hit by the first wave of the SARS-CoV-2 pandemic, the Swiss Medical Board (SMB) identified a need for translation of individual risk estimates of hospitalization and severity of illness associated with SARS-CoV-2 infection for the general population. Facilitating understanding of an individual's risk of severe illness or death could support individuals and doctors in the process of Advanced Care Planning (ACP), ideally before an individual would become infected with SARS-CoV-2 (the virus) and acutely ill with COVID-19 (the disease). ACP is a process in which a person, in the context of his or her life, health and appropriately estimated risk, would choose to receive all possible care, including a prolonged stay in the intensive care unit (ICU), or would choose a less aggressive care pathway, including palliative care if needed, and thereby accepting a likely death¹. To facilitate such informed ACP, reliable data of an individual's risk of specific outcomes (e.g. hospitalization, need for ICU, likely rehabilitation requirements, long-term quality of life, death) for a specific illness are required. For translation to the individual, such data would ideally be derived in the local population and health system, be robust, rapidly available and up to date, and incorporate multiple variables applicable to an individual including age, gender, ethnicity, socio-economic status, comorbidities (pre-existing conditions, chronic illnesses) and local availability of desired medical care and support systems.

Supporting informed ACP is timely given that under pandemic circumstances more people may be thinking about advanced directives. In addition, there may be an increased need for information about ACP given that people may be less able to discuss risk with their primary care doctor given distancing rules. The public (and physicians) require easily accessible, relevant information (supported ideally by local data) regarding risk of infection, how to protect oneself, how to manage illness in the family/at work, symptoms of the illness, how to obtain testing, who pays for testing, risk of severity of illness, possible outcomes, and alternatives if ICU care is not chosen/received (i.e. palliative/supportive care, delivered by whom?). Some of this information is obtainable from diverse websites from the BAG, *Tages Anzeiger*, Swiss Info, palliative.ch etc. The SMB envisaged a collection of available data in one place, with some individualizable risk interpretation. It was anticipated that

people require multiple forms of information to meet various needs, and that information should be presented at various levels of health literacy². A further benefit of an individualized risk assessment might be to support patient-doctor discussions pre- or in-hospital, as well as supporting potential triage processes should Switzerland reach a point of having to ration hospital and/or ICU admission.

Questions posed by the Swiss Medical Board Council of Experts

Two fundamental questions arose in discussions during the Committee Meeting on 03 July 2020 regarding the need to support community members in decision making regarding COVID-19:

1. Do (vulnerable) people have the right information to assist them with informed decision-making regarding ICU admission/intubation/resuscitation? What do they need to know regarding short term prognosis, long-term prognosis, including quality of life to help them make an informed decision?
2. Is there something different about COVID-19 that would impact this advanced decision-making process compared with the usual process for any ICU admission/intubation/resuscitation?

Summary of available evidence

As an initial step, a literature search was conducted in July and August 2020 to identify what was known about individual risk. In the literature from many countries it was clear that SARS-CoV-2 is highly infectious and may be associated with severe illness which can rapidly overwhelm local capacity for all who may need ICU care. Prevention of infection therefore is key to avoid overwhelming the health services. Initial estimates suggested that 80% of infected people had mild disease, 20% required admission to hospital and 5% required ICU care^{3,4}. An updated summary is presented in Figure 1. Mortality was variable across countries depending on how overwhelmed the health services were and the age of those infected. Reports from New York⁵ described an overall mortality of 21.1% in hospitalized patients: 2.2% died in the emergency room; 14% died in hospital, and 43.6% died in ICU. A study comprising predominantly Swiss patients in ICU⁶ reported a crude mortality rate of 24%. Since the beginning of the pandemic, the global understanding of clinical presentations and complications have improved and the ability to care for patients with severe COVID-19 has improved. Mortality rates have declined. This may reflect earlier diagnosis and better care of the severely ill, in addition to more access to diagnosis and therefore a greater denominator of infected individuals. Large population-based studies and reports have consistently described similar groups to be at higher risk of severe disease and death, including older age, frailty status,

chronic diseases, socio-economic disadvantage and certain ethnicities^{7,8}. These universal risk factors are listed on the website of the Bundesamt für Gesundheit (BAG) and are included in the report of the Swiss National COVID Science Task Force.

Clinically, COVID-19 is a severe illness, but once it reaches the stage of requiring ICU care, may not be very different from a severe sepsis or other viral pneumonia. Data are however slowly emerging that the recovery process for some individuals may be prolonged.⁹ From a clinical/prognostic perspective, the information that would be required regarding a medical decision for ICU admission/Intubation/resuscitation and ACP decision-making for patients with and without COVID would therefore be very similar, i.e.

- *a patient who would not wish to be resuscitated or admitted to ICU under non-pandemic circumstances should reach the same conclusion for COVID-19*
- *a patient who wishes to be resuscitated under non-pandemic circumstances (and it would seem feasible and appropriate to do so medically), should have their wishes respected from a clinical perspective under pandemic circumstances*

Under pandemic circumstances, however, patients wishing to be admitted to ICU should be aware that if triage pathways are activated once resources become limited, a fair process will determine whether or not their wishes for ICU care are honoured or not.

Palliative care services are crucial and must be available at all times. Importantly, in SMB discussions with various stakeholders, a representative from the *mfe* (Médecins de la famille et de l'enfance, Suisse) raised the point that as discussions around triage and rationing of ICU beds arose in the media during the 1st wave of the pandemic, some elderly patients had expressed uncertainty about their own advanced directive wishes regarding potential treatment in ICU (if possible) or not, given their age and/or health status, in the context of the broader potential bed shortages. This dilemma illustrates the importance of accurate, up to date, data to meaningfully inform decision-making for doctors and patients.

What was clear from the literature search was that publicly available data from Switzerland was limited and not adequate to facilitate individualized ACP. In addition, most of the global literature on the impact of comorbidities did not report on the impact of multiple simultaneous comorbidities, which would be clinically relevant especially in the aging population where comorbidities accumulate¹⁰. How risk would change in a person with 1, 2 or 3 simultaneous comorbidities has been

infrequently reported, and even the confidence intervals around risk-estimates for individual comorbidities were broad and highly variable, making extrapolation to an individual impossible ¹¹. Similarly, data on outcomes post-COVID-19 were also very sparse globally. No data was available on long-term outcomes from Switzerland.

In a second step, the SMB therefore decided to attempt to gather some primary data from Switzerland to determine whether it would be possible to better inform the Swiss public, especially those belonging to high-risk groups. In August and September 2020 the SMB reached out to multiple stakeholders including: *Schweizerische Gesellschaft für Physikalische Medizin und Rehabilitation (reha Schweiz)*; *Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren (GDK)*; *Schweizerische Gesellschaft für Intensivmedizin (SGI)*; *Schweizerische Fachgesellschaft für Geriatrie (SFGG)*; *Médecins de la famille et de l'enfance, Suisse (mfe)*; *palliativ ch*; *Triemli Spital*; *RISC-19-ICU Studie*; *COVID-19 Hospital Based Surveillance Studie (CH-SUR)*. Most stakeholders found the project relevant and were interested to contribute but collected no data themselves. *Palliativ ch* had already conducted a Summer School on ACP run by the Taskforce *palliative ch* and shared the presentations and protocols. These data are available on their website. The RISC-19-ICU⁶ study was willing to collaborate with SMB, however their data was limited to around 800 patients admitted to ICU during the 1st wave, and would not inform hospitalization risk or decision-making about ICU admission. Their data showed however that only a minority of patients admitted to ICU with COVID-19 had multiple comorbidities (personal communication, Dr M. Hilty), suggesting either a *de facto* triage was happening on the ground pre-ICU, or that the sicker patients had advanced care directives or made decisions declining ICU care. National hospitalization data also suggest that overall patients admitted to ICU in Switzerland during the first wave of COVID-19 were around 10 years younger than those admitted to hospital (Figure 2). There is no data to determine the processes which led to younger and healthier patients being admitted to ICU. The Internal Medicine department at Triemli hospital shared data on 21 patients admitted during the 1st wave who died with COVID-19 (personal communication, Dr M. Stüssi-Helbling). Their data illustrated what has been previously highlighted, that the minority of patients arrive to hospital with an advanced care directive, even among those with multiple pre-existing comorbidities. In both the RISC-19-ICU study and at Triemli hospital, decisions on withdrawal or continuation of care were made jointly by clinicians and patient families at the bedside.

The SMB made an application to the CH-SUR database to obtain data collected from many hospitals around Switzerland on outcomes in patients admitted with COVID-19. The goal was to present outcomes graphically, stratified by age, gender, frailty score and individual comorbidity. After

graphical analysis of the CH-SUR data in October 2020, the data was shared with the CH-SUR team. As the data is owned by the BAG, the SMB was not permitted to disseminate them, as understandably the BAG plans to publish the data themselves. The analyses however did confirm that the risk factors for severe COVID-19 in Switzerland do appear consistent with those reported elsewhere, and as expected mortality was highest among the elderly, males and those with higher frailty scores (statistics not performed). Importantly, data on ethnicity and socio-economic status is not collected in Switzerland despite strong indications from elsewhere that these factors contribute to risk of severe COVID-19¹².

In the interim, while the SMB was collecting possible data from Switzerland, an individualized risk calculator has been developed at Oxford University (QCOVID, <https://qccovid.org>)¹³. This calculator represents what the SMB had identified as needed. The algorithm was derived in a set of over 6 million people in the UK and validated in a further 2 million. A detailed individualized estimation of risk e.g. 1:900 or 1: 4000 depending on individual patient data can be calculated (e.g. Figure 3), however this tool is not yet available for clinical use. The amount of data required and the hesitancy to permit clinical use illustrate the complexities inherent in such calculators, and the need to ensure accuracy and reproducibility of data which may impact individual life-and-death decisions. The SMB was never in a position to develop such a tool for Switzerland. At best using the CH-SUR data, stratified group risks could have been presented, which would have had unknown applicability to an individual, especially for an individual who may have seen themselves represented in several graphs (e.g. graphs depicting risk of death by frailty (x%), smoker (y%), and heart disease (z%) separately). How an individual in the community would interpret the 3 different risk proportions, and whether this would be helpful at all or would add to their confusion and fear is unknown.

In addition, there has been progress since the 1st wave in clinical management and fewer patients are cared for in ICUs. The majority of patients admitted to hospital remain in general medical wards dedicated to COVID-19 care or are admitted to intermediate care units for supplemental oxygen. Such non-ICU escalations in care may not be covered in an advanced care directive, as most are non-invasive, and some measures could even be utilized/indicated at the palliative stage. Given the threat of rationing however, the Swiss Society of Intensive Care has called for people to think about advanced directives in an attempt to reduce demand on ICU services (Nov 17 2020).

A 2018 study in Switzerland (Swiss SHARE)¹⁴ found that 21.1% of community dwelling adults over age 50 have an advanced directive (Figure 4). There is therefore a need to continue to develop awareness around ACP in Switzerland, not only related to the current pandemic. ACP may not only ensure that

an individual's wishes are respected as far as clinically reasonable, but also reduces stress imposed on family members and clinicians to have to make decisions at the bedside without knowing a patient's wishes, which ultimately may lead to unnecessary suffering and use of health care resources in patients who, if appropriately informed ahead of time, may not have chosen ICU care.

Recommendation

Despite the importance of the topic, on 20.11.2020, given the challenge posed by the lack of Swiss data, and that the collation and dissemination of information regarding disease risk is not the "core business" of the SMB, the Council of Experts elected not to proceed further with this project.

References

- 1 Block, B. L., Smith, A. K. & Sudore, R. L. During COVID-19, Outpatient Advance Care Planning is Imperative: We need All Hands on Deck. *Journal of the American Geriatrics Society*, doi:10.1111/jgs.16532 (2020).
- 2 Mishra, V. & Dexter, J. P. Comparison of Readability of Official Public Health Information About COVID-19 on Websites of International Agencies and the Governments of 15 Countries. *JAMA network open* **3**, e2018033, doi:10.1001/jamanetworkopen.2020.18033 (2020).
- 3 Wu, Z. & McGoogan, J. M. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases From the Chinese Center for Disease Control and Prevention. *Jama*, doi:10.1001/jama.2020.2648 (2020).
- 4 Robert Koch Institut. *SARS-CoV-2 Steckbrief zur Coronavirus-Krankheit-2019 (COVID-19)*, <https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html#doc13776792bodyText16> (2020).
- 5 Argenziano, M. G. *et al.* Characterization and clinical course of 1000 patients with coronavirus disease 2019 in New York: retrospective case series. *BMJ (Clinical research ed.)* **369**, m1996, doi:10.1136/bmj.m1996 (2020).
- 6 Wendel Garcia, P. D. *et al.* Prognostic factors associated with mortality risk and disease progression in 639 critically ill patients with COVID-19 in Europe: Initial report of the international RISC-19-ICU prospective observational cohort. *EClinicalMedicine* **25**, 100449, doi:10.1016/j.eclinm.2020.100449 (2020).
- 7 Williamson, E. J. *et al.* Factors associated with COVID-19-related death using OpenSAFELY. *Nature* **584**, 430-436, doi:10.1038/s41586-020-2521-4 (2020).
- 8 Nickel, C. H., Rueegg, M., Pargger, H. & Bingisser, R. Age, comorbidity, frailty status: effects on disposition and resource allocation during the COVID-19 pandemic. *Swiss medical weekly* **150**, w20269, doi:10.4414/smw.2020.20269 (2020).
- 9 Carfi, A., Bernabei, R. & Landi, F. Persistent Symptoms in Patients After Acute COVID-19. *Jama* **324**, 603-605, doi:10.1001/jama.2020.12603 (2020).
- 10 Clark, A. *et al.* Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study. *Lancet Glob Health* **8**, e1003-e1017, doi:10.1016/S2214-109X(20)30264-3 (2020).
- 11 Ssentongo, P., Ssentongo, A. E., Heilbrunn, E. S., Ba, D. M. & Chinchilli, V. M. Association of cardiovascular disease and 10 other pre-existing comorbidities with COVID-19 mortality: A systematic review and meta-analysis. *PLoS One* **15**, e0238215, doi:10.1371/journal.pone.0238215 (2020).
- 12 Bhala, N., Curry, G., Martineau, A. R., Agyemang, C. & Bhopal, R. Sharpening the global focus on ethnicity and race in the time of COVID-19. *Lancet (London, England)*, doi:10.1016/s0140-6736(20)31102-8 (2020).
- 13 Clift, A. K. *et al.* Living risk prediction algorithm (QCOVID) for risk of hospital admission and mortality from coronavirus 19 in adults: national derivation and validation cohort study. *BMJ (Clinical research ed.)* **371**, m3731, doi:10.1136/bmj.m3731 (2020).

- 14 Vilpert, S., Borrat-Besson, C., Maurer, J. & Borasio, G. D. Awareness, approval and completion of advance directives in older adults in Switzerland. *Swiss medical weekly* **148**, w14642, doi:smw.2018.14642 10.4414/smw.2018.14642 (2018).

Figure 1

TYPICAL PROGRESS OF COVID-19

(in an ideal world where everyone gets treatment)

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4th version

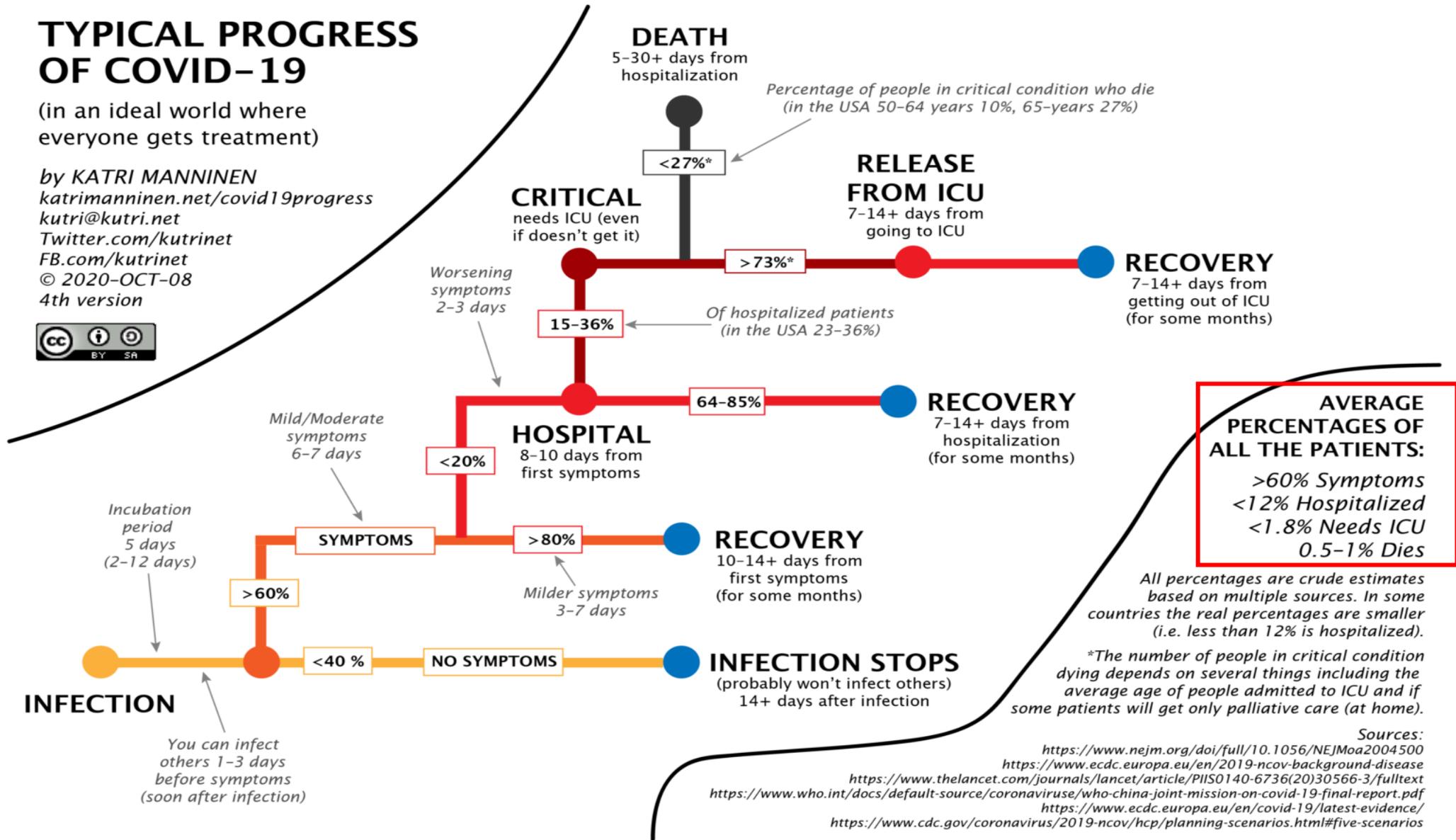
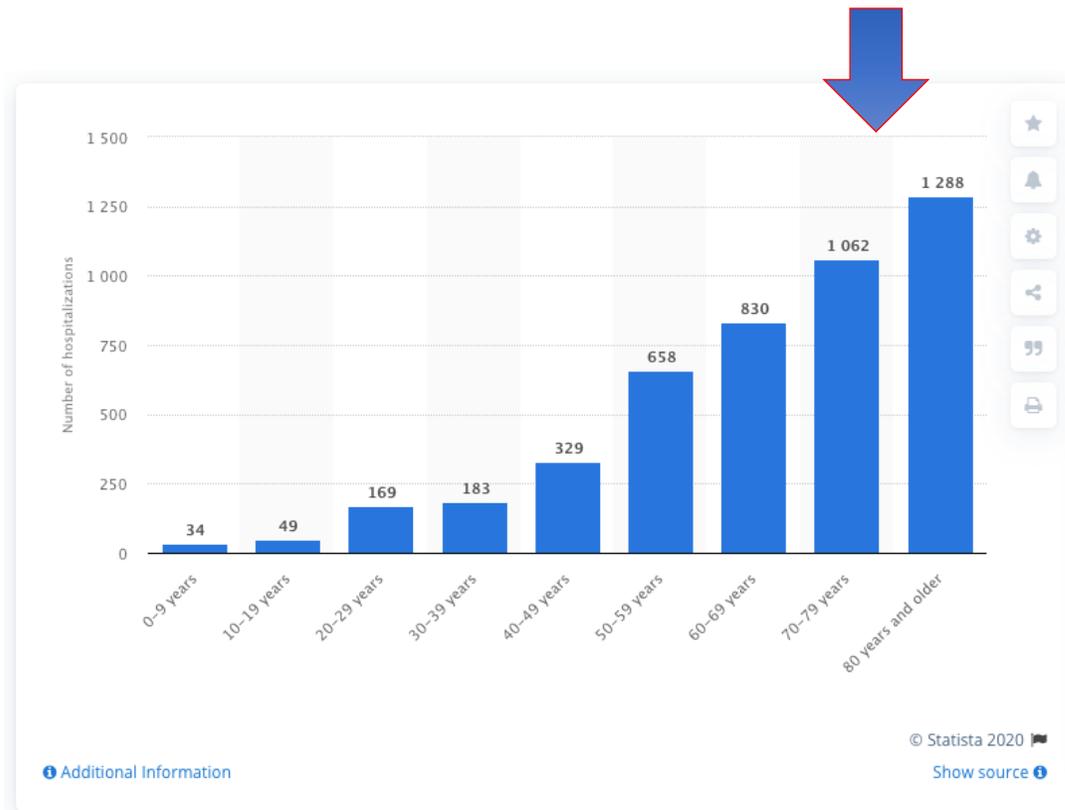


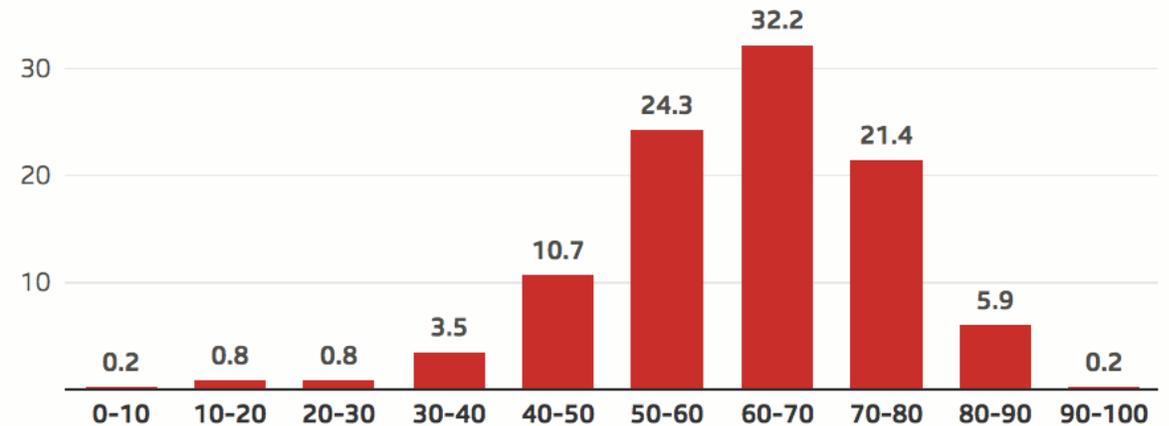
Figure 2

SWISS hospitalization and ICU data



Anteil von Covid-19-Patienten nach Alter auf Schweizer Intensivstationen

Angaben in Prozent



Kumulierte Werte bis zum 25. Mai 2020

Quelle: Schweizerische Gesellschaft für Intensivmedizin

Personal Information

Age (19 -100)

Biological sex

 Male
 Female

Ethnicity

Select one option

Body Mass Index (BMI)

Height (cm)

Weight (kg)

UK postcode

Leave blank if unknown

Housing category

 Nursing or care home
 Homeless
 or
 Neither in nursing or care home, nor homeless

Clinical information

Diabetes?

 Yes, type 1
 Yes, type 2
 or
 None

Chronic kidney disease (CKD)?

Select one option

Sickle cell disease or severe combined immunodeficiency syndrome?

 Yes
 No

Learning disability?

 Yes, Downs syndrome
 Yes, other learning disability
 or
 None

Cancer treatments and immunosuppressants

Chemotherapy treatment

Select all options that are relevant.

 Had radiotherapy in the last six months
 Currently have cancer of the blood or bone marrow such as leukaemia, myelodysplastic syndromes, lymphoma or myeloma and are at any stage of treatment
 Had a bone marrow transplant in the last 6 months
 Had a solid organ transplant (e.g lung, liver, stomach, pancreas, spleen, heart or thyroid)
 Been prescribed immunosuppressants by a GP in the last six months.
 Been prescribed oral steroids by a GP in the last six months

Severe respiratory or lung problems

Select all options that are relevant.

 Have asthma
 Currently taking anti-leukotrienes or a long-acting beta2-agonist (LABA)
 Have cystic fibrosis or bronchiectasis or alveolitis
 Have pulmonary hypertension or pulmonary fibrosis
 Have chronic obstructive airways disease (COPD)
 Have a lung or oral cancer

Neurological problems

Select all options that are relevant.

 Have Parkinson's disease
 Have epilepsy
 Have dementia
 Have motor neurone disease, multiple sclerosis, myasthenia, or Huntington's Chorea
 Have cerebral palsy

Heart or circulation problems

Select all options that are relevant.

 Have a congenital heart problem
 Have coronary heart disease
 Had a stroke
 Have atrial fibrillation
 Have heart failure
 Have peripheral vascular disease
 Had a thrombosis or pulmonary embolus

Other conditions

Select all options that are relevant.

 Have severe mental illness
 Have cirrhosis of the liver
 Have rheumatoid arthritis or SLE
 Had a prior fracture of hip, wrist, spine or humerus

Risk assessment results

The risk table

The table shows the absolute risk of catching and dying COVID-19 over a 90-day period based on data from the first peak of the pandemic. There is a comparison with the risk for a person of the same age and sex but with no risk factors. The relative risk is the absolute risk divided by this average risk.

	Absolute risk (a)	Relative risk with no factors (b)	Relative risk (a/b)
COVID associated death	0.1095% 1 in 913	0.0101% 1 in 9901	10.8416
COVID associated hospital admission	0.4373% 1 in 229	0.0695% 1 in 1439	6.2921

In other words in a crowd of 10000 people with the same risk factors, 11 are likely to catch and die from COVID-19 and 44 to be admitted to hospital during a 90 day period similar to the recent peak.

The BMI is 27.68

COVID associated death

Risk is **1 in 913**.
 This is in rank 90 out of 100, where 100 is most at risk.

Disclaimer

It is important to note that the absolute risks presented here are based on data collected in the first few months of the pandemic. These absolute risks are changing over time in line with the COVID-19 infection rate, the extent of social distancing measures in place, and individual behaviour, and so the values should be interpreted with caution. The relative risks and ranking of absolute risk values are likely to remain more stable over time.

Figure 4.

Swiss SHARE sample is designed to be nationally representative of community-dwelling individuals aged 50 years and older + partners

Figure 1: Completion of advance directives (ADs) by sociodemographic characteristics, adults aged 55+ in Switzerland, weighted percentage and 95% confidence intervals, SHARE 2015.

