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Expert guidance for COVID-19 vaccine deployment in Switzerland: a Delphi process

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Summary

BACKGROUND AND AIM: Vaccines providing protection against COVID-19 are a core tool for ending the pandemic. Though international organisations created guidance in 2020 for vaccine deployment, this had to be adapted for each country's situation and values. We aimed to assist public health decision makers by identifying areas of consensus among Swiss experts for the deployment of one or more novel COVID-19 vaccines.

METHODS: An electronic, modified Delphi process between September and November 2020. We recruited a convenience sample of experts working in Switzerland from a variety of specialities, who completed two anonymous questionnaires. They voted on clarification questions and guidance statements from 0 (complete disagreement) to 10 (complete agreement). Responses for guidance statements with a median ≥8 and a lower interquartile range bound ≥7 were considered as reaching consensus.

RESULTS: Sixty-five experts accepted (66% response rate), with 47 completing the first questionnaire (72%), and 48 the second (74%). Statements reaching consensus included: in the first phase we should vaccinate front-line healthcare professionals and people ≥65 years with risk factors; widespread vaccination of children and adolescents should not be an early priority; and vaccines should be provided free of charge in the setting of national or cantonal vaccination campaigns. Statements not reaching consensus included: early vaccination of people living with someone with risk factors who are not themselves at risk; vaccination of people with previous confirmed or suspected COVID-19; and whether vaccination should be mandatory for individuals with certain activities, such as front-line healthcare professionals.

CONCLUSIONS: Experts reached consensus on several statements that were available for decision-makers when making key decisions for COVID-19 vaccine deployment in Switzerland. Statements without consensus highlighted areas requiring expert and public dialogue. The modified Delphi process allowed us to rapidly synthesise views from a broad panel of experts on sensitive topics, and could be considered for a broad range of issues during public health crises.

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Introduction

Vaccines providing protection against COVID-19 are a core tool for ending the pandemic [1]. In mid to late 2020, significant uncertainty remained regarding early vaccine deployment. Several bodies developed expert guidance documents for decision makers outlining potential deployment strategies, including priority groups and means of improving vaccine uptake [2–7]. However, these documents had limitations. The World Health Organization's global approach had to be refined and adapted to each country's context [8]. A guidance document from France clearly identified priority populations, depending on levels of COVID-19 propagation when the vaccine became available, but did not give recommendations for specific populations such as children and pregnant women [6]. A German policy brief addressed difficult ethical issues such as mandatory vaccination and the need for a transparent vaccination strategy, but failed to address practical issues such as who should perform vaccination and whether to vaccinate those who have had a positive test for SARS-CoV-2 [7]. Importantly, none of the guidance documents provided information about controversial areas lacking consensus, thus simplifying reporting but potentially undermining trust and public dialogue. As data emerged that one or more vaccines would be safe and effective against COVID-19, Swiss authorities still needed to make critical decisions tailored to the country's context and values. Indeed, countries differ in the value they place on the need for certain safety data, their access to early vaccines and the need to prioritise specific, marginalised populations for early vaccination (e.g., indigenous populations).

The Delphi method provides a transparent method for identifying areas of expert consensus in an environment of rapidly evolving evidence or on topics lacking evidence [9]. The Delphi method could be preferable to convening a task-force, for instance, because a large number of diverse experts can be convened asynchronously, with a written trace of all opinions and anonymous voting, allowing experts to express themselves more freely. We aimed to assist public health decision makers by identifying areas of

consensus among Swiss experts for the deployment of one or more novel COVID-19 vaccines.

Methods

Setting and design

We conducted an electronic, modified Delphi process between September and November 2020. Our protocol (see appendix) planned for three Delphi rounds, but only two were needed as we had reached sufficient consensus to inform decision-makers. We recruited a convenience sample of Swiss experts from a variety of specialities by email. Experts were university-based professionals recognised for their knowledge areas of relevance, such as vaccinology, public health and medical ethics. We aimed to achieve a balance of language areas, specialities and gender. We specifically did not include key stakeholders such as government officials or members of the Federal Vaccination Commission. We provided experts with a summary of key literature, including guidance documents from other countries and a description of phase III trials in progress. During the study period COVID-19 cases were increasing rapidly in Switzerland and phase III vaccine results were not yet available. Ethics approval was not required as all information was collected anonymously. We informed key decision makers in Switzerland about our project (the Federal Office of Public Health (FOPH) and the Federal Commission for Vaccination) and worked in collaboration with the Swiss National COVID-19 Science Task Force.

Delphi questionnaires

Questionnaires were developed in English by the co-authors and submitted for feedback to an ad-hoc scientific committee with 10 members from institutions other than our own (8 of whom also participated in the Delphi process). Questionnaires were checked for clarity of language by five local physicians.

We sent participants open links to the survey questionnaires available on REDCap®, with up to two reminders. No remuneration was provided. Experts voted on clarification questions and guidance statements (all questions and responses are available in the appendix). Clarification questions were used, for example, to define minimum thresholds of vaccine efficacy and rank priority groups. Experts also provided free-text comments. Guidance statements were scored from 0 (complete disagreement) to 10 (complete agreement). Though an answer was required for all questions, experts could choose to opt out of individual questions, for example when lacking expertise. All questionnaires were complete.

Analyses

Because of the non-normal distribution of most responses, agreement scores were presented using medians and interquartile ranges (IQRs). Responses with a median ≥8 and a lower IQR bound ≥7 were considered as reaching consensus. All analyses were performed with STATA Version 16.0.

Results

Of 98 experts asked to participate, 65 (66%) accepted (table 1). Forty-seven experts completed the first questionnaire (72%) and 48 the second (74%).

Key statements that did and did not reach consensus are listed in figures 1 and 2. The median of statements reaching consensus ranged between 8 and 10, while those not reaching consensus ranged between 5 and 9. Two statements included among those reaching consensus do not have a score; they were included based on a high number of votes to vaccinate people ≥65 years without risk factors, and those aged 18 to 65 with ≥1 risk factor in the second and third phases.

Various distributions of level of agreement were seen for questions not reaching consensus (fig. 3). Whereas some statements approached consensus (fig. 3A), others had a wide distribution of answers fig. (3D), or even strong opposing views (figs 3B and C). Full results of both Delphi rounds are available in the appendix.

Discussion

Using a Delphi process, we reached consensus on several key aspects of COVID-19 vaccine deployment in a short time-frame, including desired vaccine characteristics, priority groups for early vaccination, approaches to subgroups such as children and pregnant women, and means of improving vaccine acceptability. Equally importantly, we identified relevant areas without consensus. Some approached consensus, such as prioritising early vaccination of individuals living with someone at high risk. Others revealed strong opposing views, such as whether vaccination should be mandatory for some groups such as health professionals. The Delphi process is an important means of advancing discourse on controversial, evolving topics.

Our primary results were published online on 18 November 2020 after two Delphi rounds [10]. We had met the predefined consensus criteria on several important points and an additional round would have delayed results beyond the time when they could still aid decision makers. The vaccination strategy of the FOPH and the Federal Commission for Vaccination was published on 16 December 2020 [11]. Their strategy overlapped with our results in most

Table 1:
Characteristics of study participants (n = 65).

	Number (%)
Gender	
Female	29 (45%)
Male	36 (55%)
Language region of professional activity	
German	30 (46%)
French	31 (48%)
Italian	4 (6%)
Speciality	
Infectious disease / vaccinology	17 (26%)
Family medicine / integrative medicine	12 (18%)
Public health	8 (12%)
Paediatrician / Gynaecologist	7 (11%)
Medical ethics / sociology / anthropology	6 (9%)
Hospital internal medicine / intensive care	5 (8%)
Geriatrics / nursing facilities	5 (8%)
Pharmacist	5 (8%)

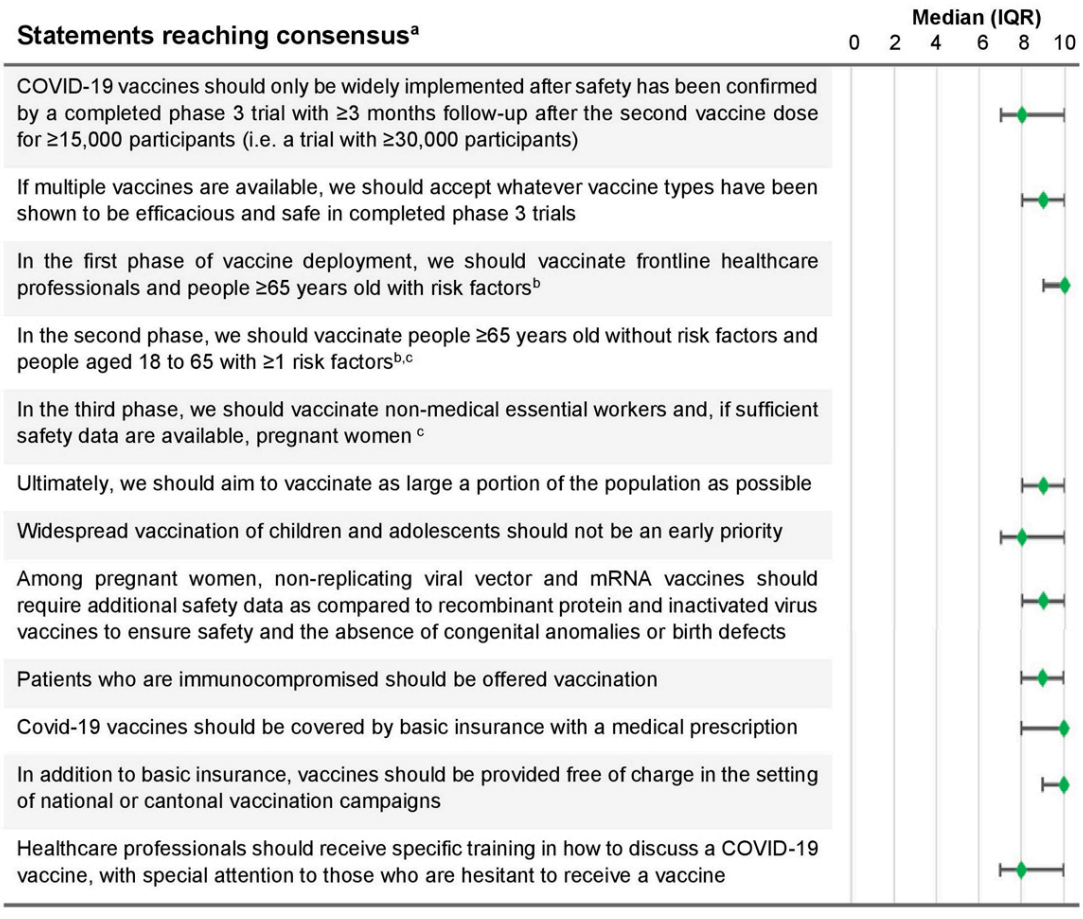
key areas. However, it prioritised vulnerable populations (≥65 years of age with risk factors and ≥75 years) above front-line healthcare workers, instead of considering them in parallel. It supported not pursuing early vaccination of children, adolescents and pregnant women. Important decisions were also made in areas where we did not find consensus. For instance, people who live with someone at high risk were prioritised above essential workers or adults <65 years living in community settings. Further, the chosen strategy did not include testing for SARS-CoV-2 antibodies; the decision was made not to vaccinate as many people as quickly as possible, but to conserve a sufficient number of vaccine doses to ensure that anyone receiving a first dose can get a second; and that vaccination should in no case be obligatory.

More recently, as of August 2021, just under half the Swiss population had been fully vaccinated and the rate of vaccine administration was slowing despite adequate vaccine supply [12]. There is now less focus on the fair allocation of vaccines and increasing pressure to use incentives to increase vaccination rates, especially with the threat of COVID-19 variants.

Several of our statements reaching consensus overlapped with international guidelines available at the time, including early vaccination of those ≥65 years with risk factors for severe COVID-19 and health professionals [6,7,13]. We further offered guidance for some specific subgroups, for example, to vaccinate immunosuppressed persons or pregnant women if sufficient safety data become available, but to delay vaccination of children and adolescents. Similar decisions were subsequently taken by the American Centers for Disease Control and several European countries [14]. Some areas where there was consensus in our study but not in other countries may reflect distinctly 'Swiss' values, underlining the importance of country-specific studies. For instance, there was consensus that non-replicating viral vector and mRNA vaccines should require additional, specific safety information before being given to pregnant women. Other countries, such as the United States, offered mRNA vaccines to pregnant women very early. Even 8 months later, in August 2021, written consent by the woman and her gynaecologist is required in Switzerland.

Lack of consensus in some areas in our study was sometimes reflected internationally by countries taking differing positions. For example, the United Kingdom chose to pri-

Figure 1: Key recommendation statements that reached consensus.[a] Agreement scores were on a scale from 0 (complete disagreement) to 10 (complete agreement). The green diamond is the median score, with horizontal bars representing the interquartile range (IQR). [a] Consensus was defined as a median agreement score of ≥8 out of 10, with a lower IQR bound ≥7 [b] Risk factors as defined by the Swiss Federal Office of Public Health at https://www.bag.admin.ch/bag/en/home.html [c] Experts voted on which groups to include in the second and third phases: (1) people aged ≥65 years old without FOPH risk factors (78%); (2) people aged 18 to 65 with ≥1 FOPH risk factor (62%); (3) non-medical essential workers (30%); and (4) Pregnant women (27%).



oritise giving as many people as possible one vaccine dose [15], while the Food and Drug Administration in the USA clearly stipulated that two doses should be given at recommended intervals [16]. Sixteen European Union countries extended timing between doses [17]. One advantage of identifying statements not reaching consensus was to demonstrate areas where experts disagree, which could help the public to understand why government decisions change over time. Swiss decision makers made pragmatic decisions based on the currently available evidence, but evolving guidance can create confusion and frustration for the public.

Very large IQRs of certain statements, such as for the questions whether to use incentives or make vaccination mandatory (fig. 2), might be explained in different ways: some participants might not have been familiar with evidence in these areas; the scores might reflect differences in individual values, such as the tension between personal liberty and collective security; or there could be cultural differences between groups, such as by age or regions of Switzerland. All responses were fully anonymous, so we could not analyse potential differences between groups of experts.

Despite some limitations, the Delphi method proved useful in the context of planning COVID-19 vaccine deployment as a means of rapid, but transparent, synthesis of expert opinion. The Delphi method is limited by the time necessary to design, distribute and follow-up structured questionnaires, followed by analysis of responses and preparation of the next round [18]. However, these steps leave a trace, allowing interested parties to understand the diversity of opinions. We took steps to ensure full anonymity, allowing participants to express themselves fully. However, that prevented us from performing analyses linking responses to experts from certain specialities or regions of Switzerland. When using the Delphi methods for surveys in crisis contexts in the future, we suggest that researchers consider: (1) simultaneously involving non-experts, such as a citizen committee, to contrast their views with those of experts; and (2) using very short, frequent questionnaires giving automated real-time results, rather than longer, more formal questionnaires, to allow greater reactivity.

Strengths of our study included anonymous voting (without influence or judgement by others), rigorous criteria for consensus, and a diverse panel of experts. Weaknesses included convenience sampling, possibly having experts vote on questions outside their fields of expertise and limited generalisability to other countries and future decisions. A majority of our experts worked in healthcare and were of high socioeconomic status; they may have been more likely to vote for early vaccination of medical personnel than other groups. Some issues that occupied an important portion of our questionnaires, such as the minimum vaccine efficacy that would justify deployment, became quasi obsolete within a few weeks after obtaining our results. Fur-

Figure 2: Key recommendations not reaching consensus. Agreement scores were on a scale from 0 (complete disagreement) to 10 (complete agreement). The orange diamond is the median score, with horizontal bars representing the interquartile range (IQR). [a] Consensus was defined as a median agreement score of ≥8 out of 10, with a lower IQR bound ≥7. [b] Risk factors as defined by the Swiss Federal Office of Public Health at https://www.bag.admin.ch/bag/en/home.html

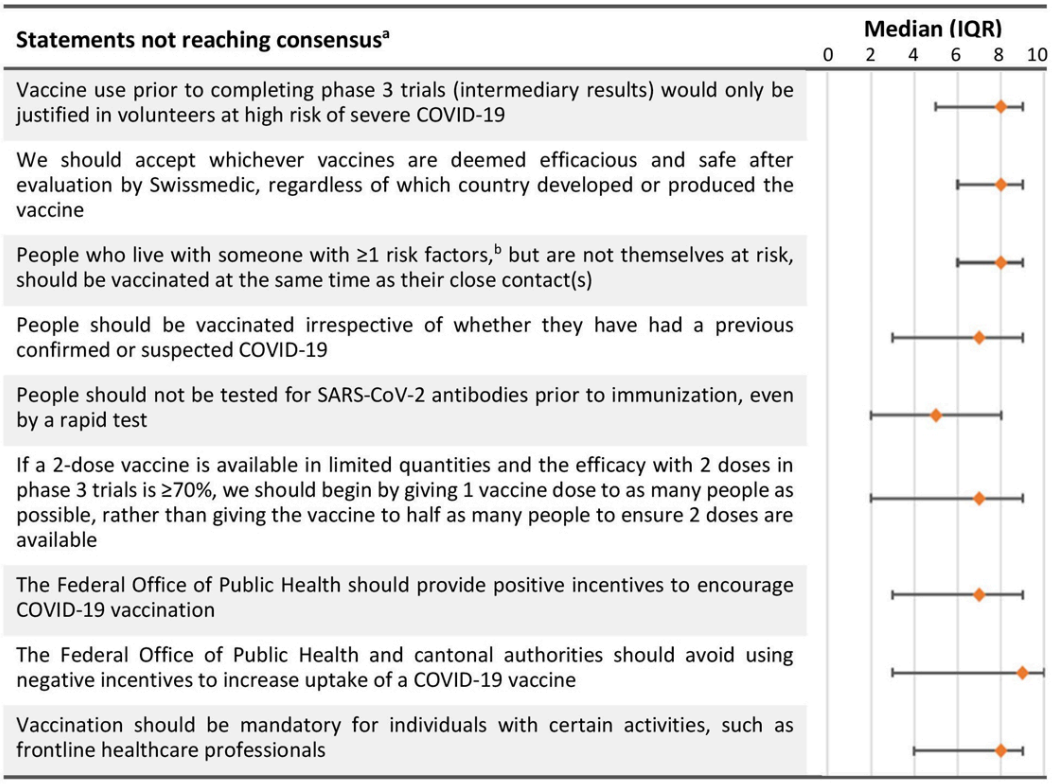
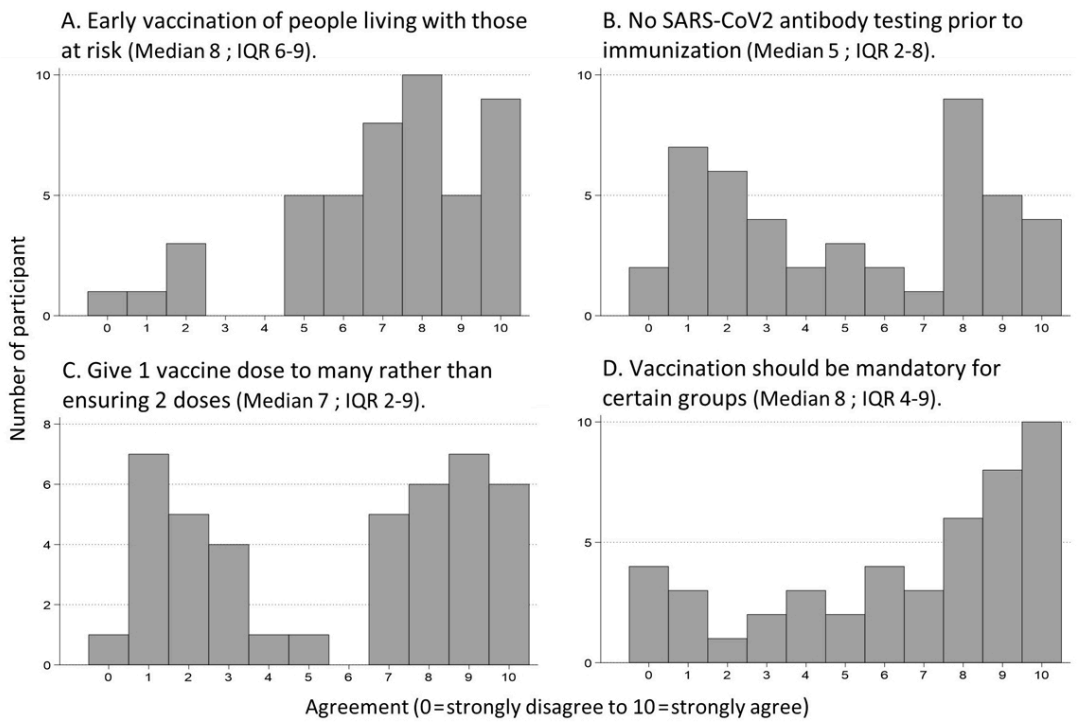


Figure 3: Distribution of responses for agreement with four selected statements not reaching consensus.



ther, we were unable to address issues that subsequently emerged, such as whether to mix different vaccines based on availability, or the use of vaccination certificates [17].

In conclusion, we rapidly generated a list of expert guidance statements, some with high levels of consensus allowing straightforward decisions, and others requiring ongoing expert and public dialogue. The Delphi method was a useful means of collecting information from a diverse panel of experts with a transparent trace of all opinions; other researchers may wish to use this technique when there is intense public scrutiny but evidence is lacking.

Disclosure statement

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Appendices

COVID-19 vaccine deployment in Switzerland: a Delphi consensus process

Unisanté working group: Jacques Cornuz, Blaise Genton, Kevin Selby, Yann Sancosme, Marc-Antoine Bornet, Valérie d'Acremont, Serge de Vallière, Erik von Elm

Scientific advisory committee: Pascal Bonnabry (pharmacist, University of Geneva), Jan Fehr (infectiologist, University of Zurich), Antoine Flahault (Global health, University of Geneva and COVID task force), Samia Hurst (Medical Ethics, University of Geneva and COVID Task Force), Marie-Paul Kieny (President of French Covid-19 task force, Haute Autorité de la Santé), Sonja Merten (Vaccine hesitancy / social scientist, Swiss TPH), Vincent Mooser (Internal medicine, McGill University), Anita Niederer (pediatrician, Federal Commission Vaccination), Laurence Senn (Infection control, CHUV), Cornelia Staehelin (infectiologist, Inselspital Bern), Manon Vouga (gynecologist, CHUV)

Background: The ongoing COVID-19 pandemic has infected millions, killed more than 900,000 people worldwide (Sept 2020 data), necessitated important restrictions on personal movement and conduct, and caused significant economic hardship. To date, no therapeutic agent has been shown to limit the spread of SARS-CoV-2 and widespread transmission might resume in Switzerland. A vaccine providing at least partial immunity to infection is widely seen as the principal means of ending this pandemic. As of September 8, 2020, the WHO had identified 34 vaccine candidates in clinical trials, including 8 in phase 3 trials, and 145 more in pre-clinical development.[1] Several countries, including Switzerland,[2] have begun to pre-order vaccines in anticipation of expedited regulatory approval of one or more COVID-19 vaccine in early 2021.

Public health authorities will need to take several critical decisions very quickly once a vaccine becomes available. Assuming that vaccines will not be available in sufficient quantities to vaccinate the entire population, which groups should be vaccinated first? What approaches can improve vaccine uptake in priority populations? How should deployment change based on the number of vaccines available and vaccine characteristics?

To aid decision-makers, Unisanté will conduct an online Delphi consensus process between September and December 2020 to explore areas of consensus and disagreement between Swiss experts. Unisanté brings together expertise in vaccine development, clinical medicine, public health, and consensus methodologies. Previous Delphi studies by our team have examined recommendations to avoid low-value care (Smarter Medicine Top 5),[3] regulatory frameworks for electronic cigarettes,[4] and malaria prophylaxis.[5] We have the support of the COVID-19 Task Force, the Federal Office of Public Health, and the Federal Vaccination Commission.

Overall objective: Help public health decision-makers by identifying areas of consensus among Swiss experts for the management and administration of one or more novel COVID-19 vaccines

Specific aims: Based on scenarios with differing baseline assumptions (ex: vaccine type, number of vaccines available), we will:

1) Create a list of necessary criteria for the widespread implementation of a COVID-19 vaccine
   Examples: A novel vaccine would need to prevent 50% of infections to justify widespread implementation
2) Identify and define priority groups for early vaccination when a COVID-19 vaccine becomes available
   Examples: Front-line healthcare workers; Persons at increased risk of severe COVID-19
3) Identify and define groups requiring special consideration based on vaccine characteristics and phase 1-3 trial data available at the time of deployment
   Examples: Pregnant women should not be vaccinated if a novel platform (ex: mRNA vaccine) is used
4) Identify strategies for vaccine deployment and administration
   Examples: Vaccines should be administered by general practitioners, in public and private ambulatory care settings, and on-site in pharmacies; Vaccines should be administered by Federal civil protection
5) Identify strategies for improving the acceptability of a COVID-19 vaccine in priority groups
   Examples: Vaccination should be obligatory for healthcare workers; Vaccines should be covered for all by basic insurance without deductible

Methods:

1. **Review and synthesis of selected documents** (Appendix 1). These documents were selected to give Delphi experts core information prior to beginning questionnaires.
    a. Guidance documents for vaccine deployment from other countries
    b. Important references from Switzerland
    c. Primary vaccine types in development
    d. Selected phase 3 clinical trials of vaccine candidates
    e. Definition and size of potential priority groups and groups requiring special consideration

2. **Study population.** The approximately 50 Delphi expert participants will be a convenience sample from several subject area, including infectious diseases and vaccinology, public health, primary care, social sciences, medical ethics and risk management. We will invite 70 people, assuming an acceptance rate of 70%, inviting additional people if needed. We will not include key stakeholders such as government officials or members of the Federal Vaccination Commission and COVID Task Force, as our goal is to help their decision-making. The draft list is in Annex 2. The Unisanté working group and the scientific committee will not participate in the Delphi process.

3. **Online Delphi process:** We will conduct an online Delphi consensus process.

    a. The **Unisanté working group** will draft all documents, including the study protocol, list of experts, brief evidence synthesis document, and questionnaires for the Delphi rounds. The Delphi process will produce statements accompanied by 1 or 2 phrases of explanation and/or justification. We will test questionnaires with local clinicians and researchers to ensure clarity and coherence.

    b. The **scientific advisory committee** will include 11 experts from outside Unisanté representing a range of specialties, and with roles in key groups such as the Swiss National COVID-19 Task Force and the Federal Commission on Vaccination. They will provide feedback on questionnaires for the Delphi process to ensure the working group is comprehensive in scope and produce statements supported by available evidence. Committee members will not participate in the formal Delphi process.

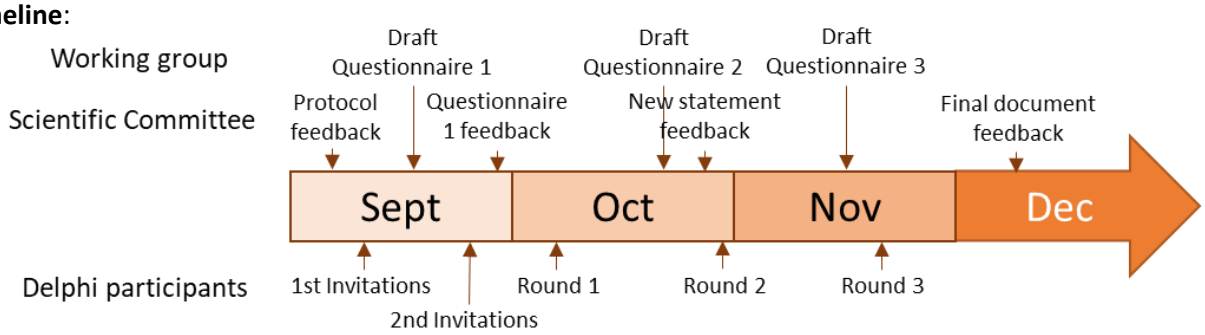
    c. The **Delphi expert participants** (appendix 2) will complete a series of three online questionnaires. In the round 1 we will ask for clarifications regarding potential consensus statements. Experts will also propose new statements based on perceived gaps. In rounds 2 and 3, we will ask participants to score statements from 0 (complete disagreement) to 10 (complete agreement). Participants will be able to choose "I don't know" if they do not have sufficient expertise on the matter, and possibly add free-text comments. In rounds 2 and 3 we will present results from earlier rounds and new statements. We anticipate three rounds will be needed to identify statements reaching consensus. Additional rounds (e.g. a fourth or fifth one) are unlikely to provide added value.

    We will collect basic demographic data about the expert participants, including whether in clinical practice, whether they have academic ties, and/or industry connections. We will use REDCap questionnaire and perform descriptive statistics (graphs, means, standard deviation) in Microsoft Excel. All documents will be in English.

4. **Conflicts of interest:** All working group and scientific advisory committee members will be required to declare potential conflicts of interest such as financial relationships with developers and manufacturers of vaccines. Employees and shareholders of such companies may be excluded.

5. **Dissemination plan**: Results will be presented in a report and initially be shared with study participants and key stakeholders (Federal office of public health, Federal Vaccination Commission, COVID-19 Task Force). A press release will be prepared. The full methodology and results will be published in an international peer-reviewed journal and local journals. Results will also be presented in a way suitable for lay audiences.

6. **Timeline**:



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Confidential document

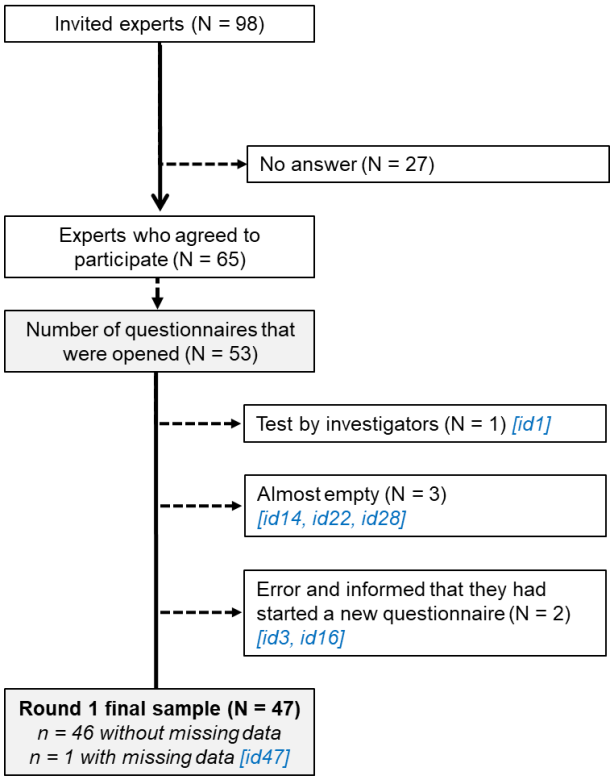
COV□□-1□vaccine deployment in S□itzerland: a □elphi consensus process

First □ound □esults

Final version 2□□1□□2□2□

□articipants

The final sample for this first round is 47 participants. The majority of questionnaires are fully completed (n = 46) and only one questionnaire has missing data (last pages not completed).



□articipant characteristics	Number (%)
Gender	
Female	29 (45%)
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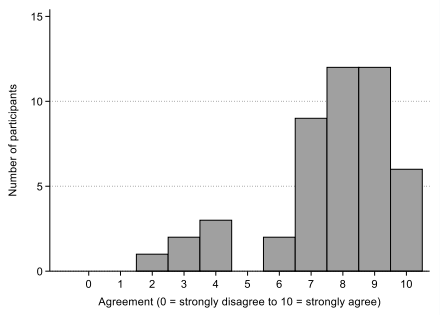
Medical ethics/Sociology/Anthropology	6 (9%)
Hospital Internal Medicine/Intensive Care	5 (8%)
Geriatrics/Nursing facilities	5 (8%)
Pharmacist	5 (8%)

A Necessary criteria for the idespread implementation of a COV -1 vaccine

1. *Background: Vaccine efficacy is the percentage reduction in confirmed symptomatic COVID-19 cases in the vaccinated group of people compared to an unvaccinated group. The precise duration of protection is unlikely to be known from initial Phase 3 trial results, but can in part be extrapolated from the immune response of infected people.*

The minimum acceptable efficacy of a COV -1 vaccine to ustify idespread implementation ill depend in part on the e pected duration of protection



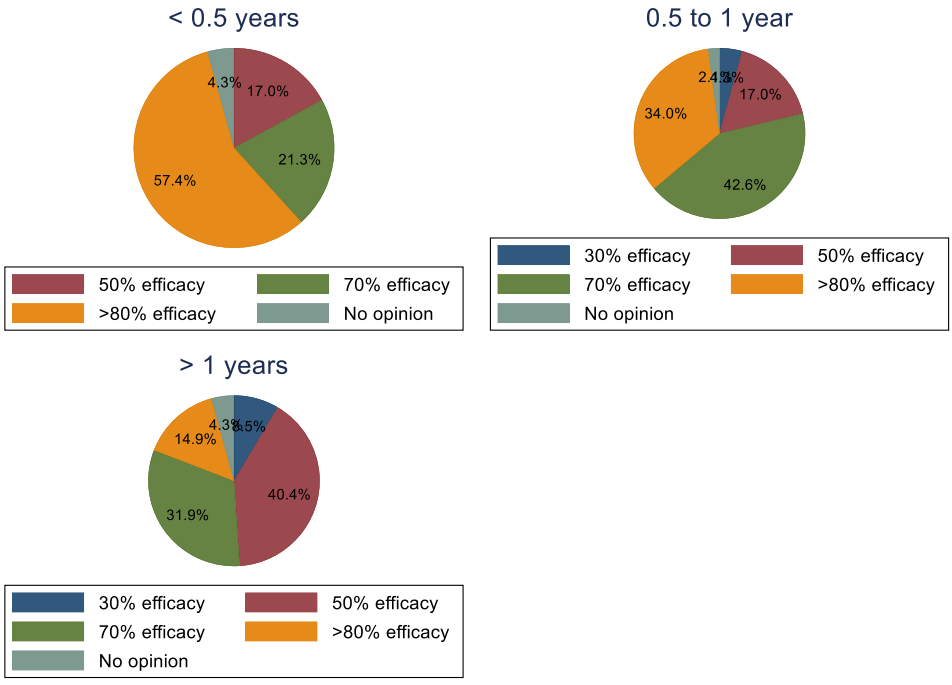
Median 8, IQR 7–9 (Mean 7.6)

No opinion: n = 0
No answer: n = 0

2. *Background: The following scenarios with three different ranges for duration of protection assume that the vaccine efficacy (in %) in the ongoing clinical trials will be statistically significant (p< 0.05). This also means that the lower bound of a confidence interval around the four values for vaccine efficacy will be greater than 0% (Example: 30%, 95% confidence interval 18%–42%).*

ut one mark for each duration of protection to choose the minimum efficacy in a phase 3 trial that ould ustify idespread implementation of a vaccine:

Expected duration of protection & Efficacy to reduce COVID-19 infections



3. *Background: The degree of certainty regarding the absence of serious adverse events from a new vaccine will depend in part on the number of people in whom it has been administered. Most protocols of vaccine trials are planning for 1 to 2 years of follow-up, though intermediate results are likely to become available based on the number of events (COVID-19 infections). Most vaccine-related serious adverse events occur within 7 days of receiving a vaccine dose.*

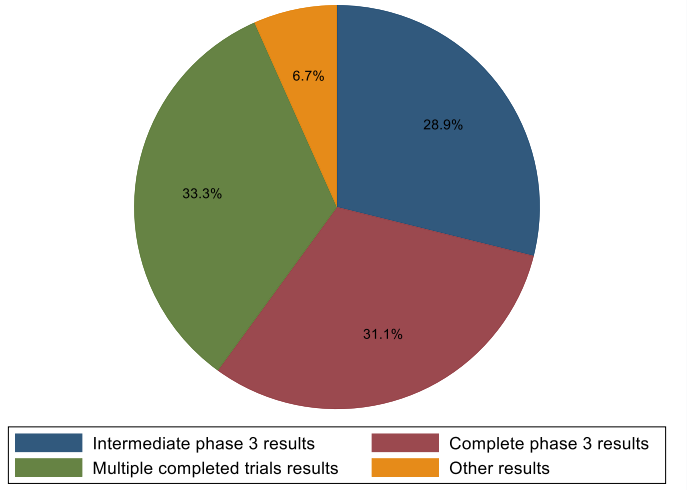
COV□□-1□ vaccines should only be □idely implemented for use in S□itzerland after safety in adults has been confirmed by:

No vaccine-related serious adverse events, based on intermediate phase 3 results for >10,000 participants with ≥3 months follow-up after the second vaccine dose

No vaccine-related serious adverse events, based on complete phase 3 results with ≥3 months follow-up after the second vaccine dose for >30,000 participants

No vaccine-related serious adverse events, based on results from multiple completed trials with, in total, >60,000 participants with ≥3 months follow-up after the second vaccine dose

Other: please specify



No opinion: n = 2
No answer: n = 0

□f □other□ please specify:

The question is inappropriate, depends of the **target** population that will be vaccinated.

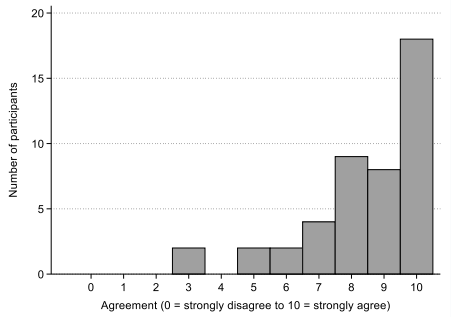
Time is the essential ingredient to assess vaccine safety. Early use should be very responsible, providing vaccine to high risk individuals from groups that have been assessed during Phase 3 and where protective efficacy has been demonstrated. **Careful monitoring** of AEFI as well as protective efficacy should be in place for at least □ **years**. Expansion of vaccine use to other groups should be incremental and, as much as possible, guided by additional clinical data.

The number of participants that has to be reached needs to be **statistically estimated** according to the COVID-Risk-Exposure and the risk profile of the participants - it's not clear to me, if there really must be a second vaccine dose in any case? Most important would be **to be sure** that the vaccination does not expose to a **more severe illness** if SARS-CoV-2 is contracted after vaccination!

I would suggest to take option A) but with "based on **complete** phase 3 results **for** □ **1□□□□□ participants**..." - since for most vaccines an event that occurs in < 1/10'000 is considered "very rare" and this option is the end of the scale in the compendium, see text copied from MMR vaccine: "Les fréquences sont indiquées comme suit: <<très fréquent>> (≥1/10), <<fréquent>> (<1/10, ≥1/100), <<occasionnel>> (<1/100, ≥1/1000), <<rare>> (<1/1000, ≥1/10'000), <<très rare>> (<1/10'000).

4. *Background: People who are immunocompromised have been excluded from most phase 3 trials. A vaccine maybe less effective for immunocompromised persons or they could suffer from rare side effects, but they are generally at higher risk of severe COVID-19. There are currently no live vaccines in phase 3 clinical trials, so SARS-CoV-2 infection should not occur.*

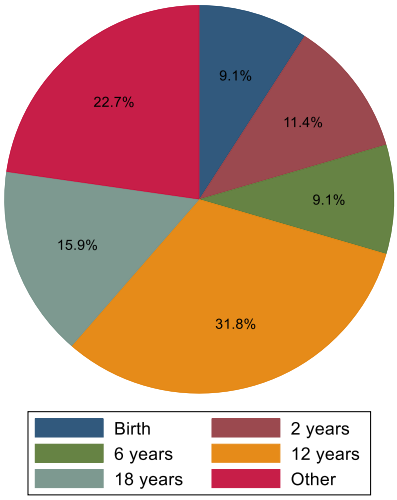
atients ho are immunocompromised should be offered vaccination, provided there is no formal contraindication



Median 9, IQR 8–10 (Mean 8.4)

No opinion: n = 2
No answer: n = 0

5. **Vaccination of children, if recommended, should begin at years of age**



No opinion: n = 3
No answer: n = 0

f Other, please specify:

6 or going to **Kindergarten or playgroup** (not before age 2-3).

I would **not vaccinate children** in the first phase but reach out to this group **only once safety** of the vaccines has been confirmed through more widespread use of vaccine in adults.

Not a priority now.

The recommended age should **depend on the safety** profile of the vaccine (as there are almost no severe COVID-19 cases among children and kids do not seem to be the main drivers of the pandemic).

Depend on their **capacity** to develop immunity.

Vaccination of children should be recommended in regard to known **risk profiles** to develop a **severe COV** disease - **age does not** seem to be the right determinant to me.

As children are **not a high risk** group for serious Covid-19, it seems more plausible to roll-out vaccines for those most at risk so as to protect them. Also, there are currently no children in vaccine trials, first **safety and efficacy** should be clearly established.

□years in □□**C** ; with □□**V** in **LM**□**C**□

>2 years only if recommended and **after a phase 3 trial**□

J'hésite entre 2 et 6 ans, mais il me manque des infos de portage du virus par les enfants qui ont moins de 6 ans; **sont-ils porteurs sains, transmettent-ils**?

6. *Background: Protocols for phase 3 trials are mostly limited to adults >18 years. A vaccine could become available without data from children. This lack of data may be more problematic for some vaccine types than others.*

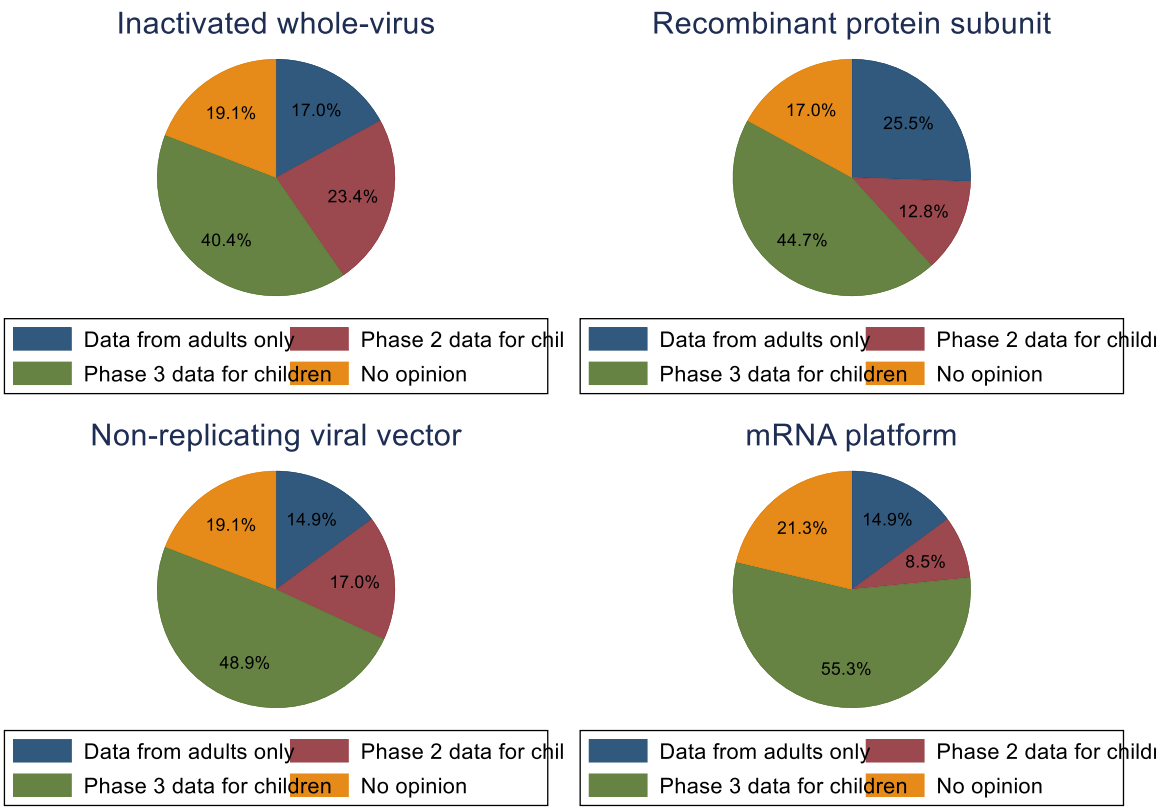
Vaccination should be recommended for children based on:

Data from adults only

Phase 2 data for children only demonstrating safety and immunogenicity

Phase 3 data for children demonstrating safety and efficacy

No opinion



7. *Background: Current protocols for phase 2 and 3 trials mostly exclude pregnant women and it is unlikely that phase 3 data will ever be available for them. This lack of data may be more problematic for some vaccine types than others. However, if pregnant women are vaccinated in other countries, phase 4 data may become available in 1 to 2 years. Routine vaccination among pregnant women currently includes inactivated whole viruses (ex: influenza), but not attenuated live viruses (ex: varicella). Non-replicating viral vector and mRNA platforms have not been used previously in pregnant women.*

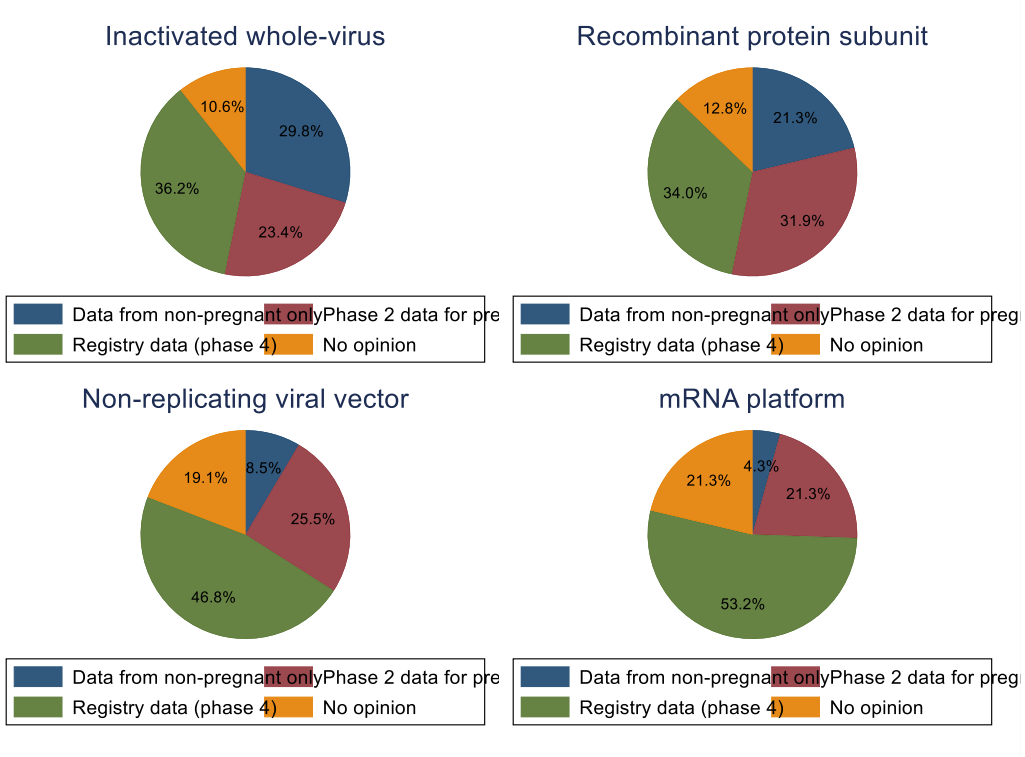
Vaccination should be recommended for pregnant □omen based on:

Data from non-pregnant adults only

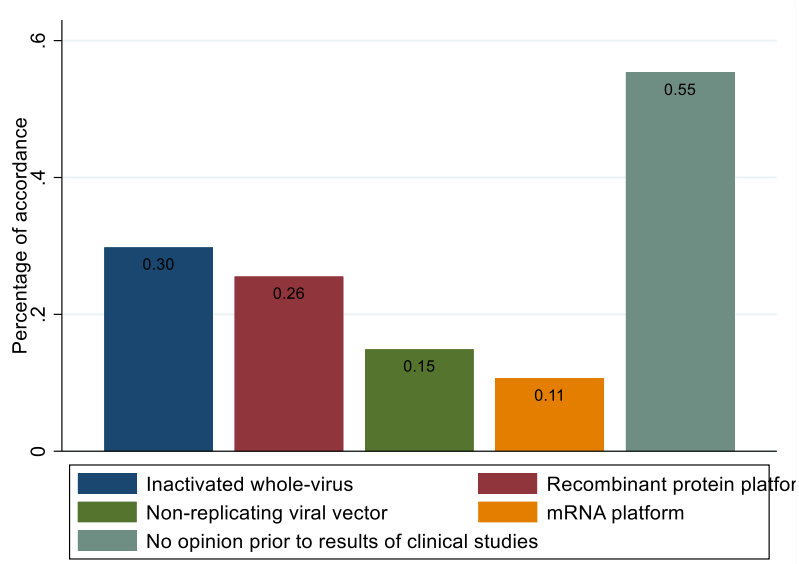
Phase 2 data for pregnant women demonstrating safety and immunogenicity

Registry data (phase 4) after vaccine implementation demonstrating no effect on birth outcomes in other countries

No opinion



8. **If multiple safe and effective vaccines are available, which vaccine type would you favor for widespread implementation**



Comments:

I did not understand why you referred to registries/phase IV studies **only in other countries**.

What makes you favour certain vaccine platforms over others

I am hesitant towards **inactivated whole-virus** vaccines (concern about Antibody-dependent enhancement). Regarding the others, I am open and would anticipate **efficacy and safety** data from trials.

Safety concerns.

Requirements for **stockage and transport** would be very important as well.

1) Experimental inactivated whole virus vaccines for other coronaviruses showed **high reactogenicity**. 2) There is a lot of experience for recombinant Protein vaccines with other viruses 3) There is less experience so far with mRNA vaccines and non-replicating viral vectors.

Because of **less side effect**.

Non-live non-nucleic acid vaccines have the longest record of safety against other diseases. Lacking the passage of time and understanding the immune response to SARS-CoV-2 products that have the **longest safety records** in their categories should be favoured initially.

Clinical experience with **influenza** vaccine development and administration.

I am not an expert on this, so my opinion comes from the **high-level** of protection that **inactivated** whole-viruses procures for other diseases.

Certain vaccines platforms are widely used for other disease.

Better known.

Efficacy is a criterion, but many experiences with inactivated viruses are also important, I think.

Innovation.

Previous data for mRNA not available.

Inactivated= safer vaccines because "no biological replication".

mRNA vaccine= " new vaccines": safety??

No integration into host genome; potent T-cell response; potential for rapid scale-up of production.

Most known.

It is valid all the time that the most efficacious vaccine should be chosen.

f you chose 'no opinion', would you agree that we should choose the most efficacious vaccine regardless of the vaccine platform

YES: n 11

Yes (7 times).

Yes, choose the most efficacious regardless of vaccine platform.

Yes, most efficacious regardless of vaccine platform.

Yes, I agree that we choose the most efficacious vaccine regardless the platform for the general adult population.

YES ith comments (mostly on safety): n

Yes agree it should be the most efficacious and meet **safety** requirements.

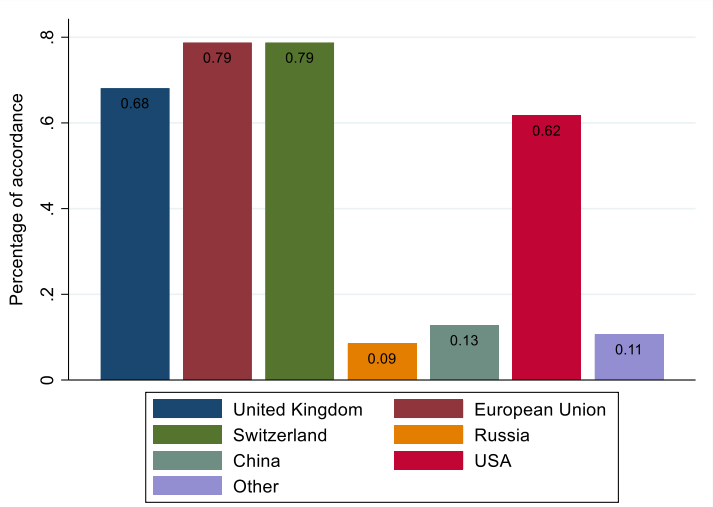
Efficacy and **safety** come first and for this we require clinical trial data. However, the scale up is also very important given the implications of the COVID pandemic, hence why this would be a key determinant.

The vaccine with the best **trade-off** between efficacy and **safety**. Safety is particularly important as those who will mostly beneficiate from vaccination are people who are potentially immunosuppressed.

Yes, the vaccine efficacy is very important. But another important attribute is **safety**.

Yes, the **safest** & most effective.

9. **f multiple vaccines are available, but are produced by companies based in different countries, hich ould you accept for use**



No opinion: n = 5
No answer: n = 0

f Other, please specify:

Depends on what **credible data** are available. If so, I would not mind where the vaccine has been produced.

No preference, the vaccine **benefit vs safety** counts.

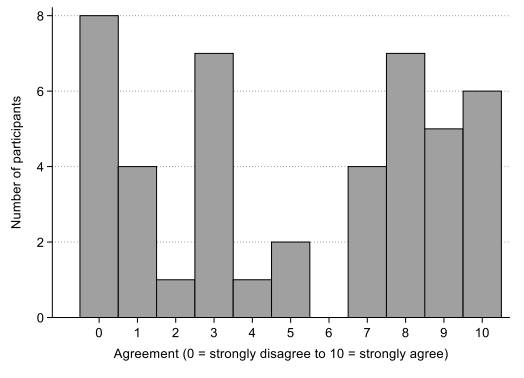
Choice should be **based on results** from completed phase 3 trials.

The criteria should not only be place of production, but also **safety of production**, certainty of procurement as well as fair prizes. As with generics, the question of use is always also tied to questions of **accessibility, quality and availability**. As long as there is a say on quality and prize, no countries should be excluded from the list.

And other countries **recognized** by **S issmedic** for importation.

10. *Background: As of September 2020, seroprevalence of SARS-CoV-2 antibodies in the general population varies greatly by canton, between 3% in Zürich and 11% in Geneva. Seroprevalence among health professionals is only marginally higher.*

□eople should be tested for SA□S-CoV-2 antibodies using a rapid test prior to vaccination



Median 5, IQR 1–8 (Mean 5.1)

No opinion: n = 2
No answer: n = 0

Comments:

I think they should be tested, but I am not sure yet what to do with it...

I would say that an antibody test should be completed before hand because it would be interesting to the antibody level after vaccination.

From a strictly logistical standpoint, the need for antibody testing prior to vaccination might well wind up being modulated by the following data: number of vaccines doses available, number of doses needed to complete vaccination & number of subjects requiring vaccination. 2. From a scientifical stand point, antibody testing prior to vaccination for might be indicated if the antibody disease enhancement phenomenon is even remotely suspected.

Testing should depend of the estimated seroprevalence: worthful in high seroprevalence setup.

Considering the cellular immunity not tested by serology, history of recent COVID should also be implemented to focus in unexposed patients.

It depends on the price of the serology.

In case of positive serology and small amount of vaccines, this might help to select patients who need most.

To answer correctly this question, we need to know more on the significance and clinical impact of SARS-CoV-2 antibodies - when do they have to be tested after exposure to sign a protective impact? Is a long-lasting immunity after COVID-exposure proven? if not - this testing would make no sense.

Comments on Section A, □Vaccine characteristics□:

A question one the would be interesting on how many boosters at which **time intervals** would be accepted.

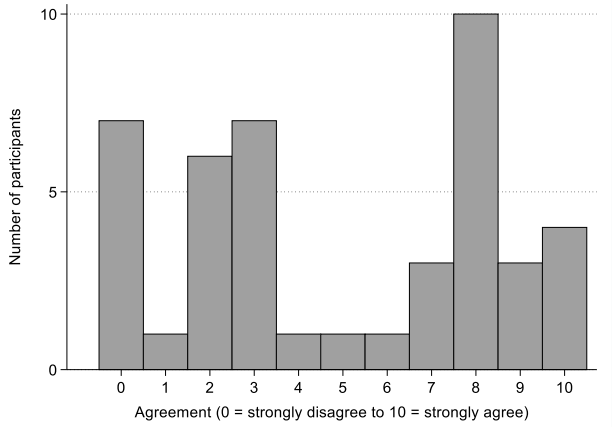
□**esponsible** use of COVID-19 vaccines should be the guiding principle. Please refer to Petousis-Harris.

Assessing the Safety of COVID-19 Vaccines: A Primer Drug Safety (2020) https://link.springer.com/article/10.1007/s40264-020-01002-6.

B□□riority groups for early vaccination □hen a COV□□-1□ vaccine becomes available *(We must assume that we will not initially be able to vaccinate all people who desire vaccination.)*

11. *Background: Several published phase 3 protocols give 2 vaccine doses, generally 28 days apart (ex: Moderna and AstraZeneca vaccines). As such, vaccine manufacturers are likely to recommend 2 vaccine doses.*

□f a 2-dose vaccine is available in limited quantities, □e should begin by giving 1 vaccine dose per person rather than giving the vaccine to half as many people to ensure that all those vaccinated receive 2 doses□



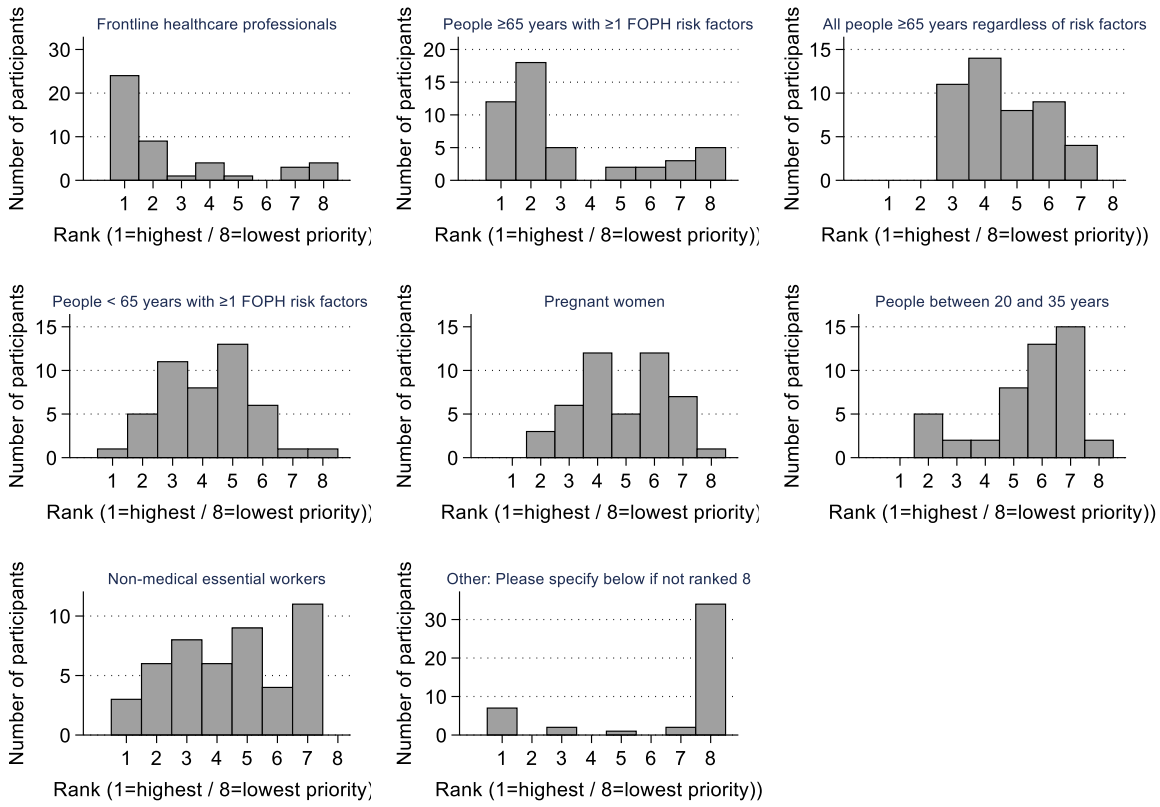
Median 4.5, IQR 2–8 (Mean 4.9)

No opinion: n = 3
No answer: n = 0

12. **Assuming vaccine doses are available for appro□imately 1,□□□,□□□ people, the first groups to be offered vaccination should be** (rank 1 - 8; 1=highest / 8=lowest priority):

If 'Other', please specify:

See next page.



If "Other", please specify:

All ages but with **risk** factors.

The first group will depend on the **effectiveness** of the vaccine; if not totally effective, the **main transmitting** group might be the best choice in a public health management (targeting the quantity and not the quality of the vaccination).

None.

Children.

Children 12-18 years old.

Comments:

Elderly people might have **lower immunogenicity**! In a limited quantity setting, the question of immunogenicity must be taken in account.

Focus for early use should be on the highest benefits given limited understanding of risks. I am concerned that **no efficacy data** will be available for **very old people** initially. Use of vaccines in such groups should be attempted but with careful study protocol, allowing at least observational estimation of vaccine effectiveness.

Priorities should be given especially to the **elderly**, as they need to be differentiated according to risk factors, as seen in the mortality curves.

This is really an interesting questionnaire. A critical issue for me in responding these questions is trying to figure out which **alternatives to vaccines exist for each group**. For example, although pregnant women can be a especially at-risk group, one could also think that they may have more capacity for alternative measures (e.g. temporal confinement, social distancing, mask) than elderly.

13. *Background: There are approximately 450,000 healthcare workers in Switzerland with varying levels of exposure to COVID-19.*

If vaccines are available in limited quantities, who should be vaccinated in priority among health professionals:

Health professionals with direct contact (< 1.5 meter distance) to patients with known or suspected COVID-19

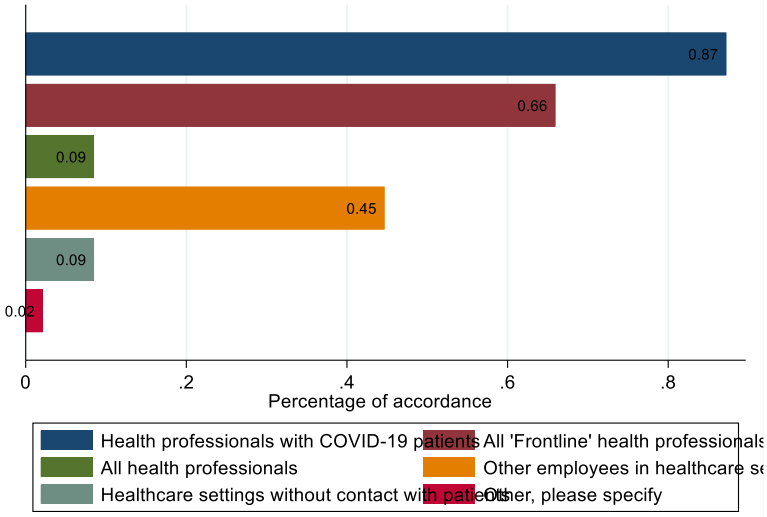
All 'Frontline' health professionals, meaning in contact with any patients

All health professionals, regardless of contact with patients

Other employees in healthcare settings in contact with patients (receptionists, hospital transport, etc.)

Other employees in healthcare settings without contact with patients, but with transversal strategic activities (cleaning staff, kitchen, technicians)

Other, please specify

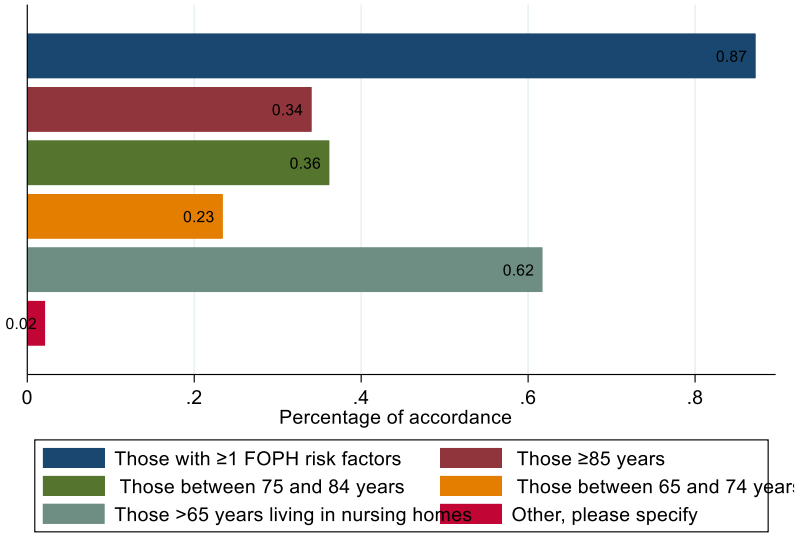


No opinion: n = 0
No answer: n = 0

If "Other", please specify:

As health professionals with direct contact in Switzerland are in general **well protected** through PPE, I would rather think that those who are in less prestigious but as important jobs as **maintenance, infrastructure** etc should be offered vaccination for free, as they might not have the same standards of PPE.

14. **There are 1.4 million people in Switzerland who are ≥65 years old. f vaccines are available in limited quantities, ho should be vaccinated ith priority in this group:**

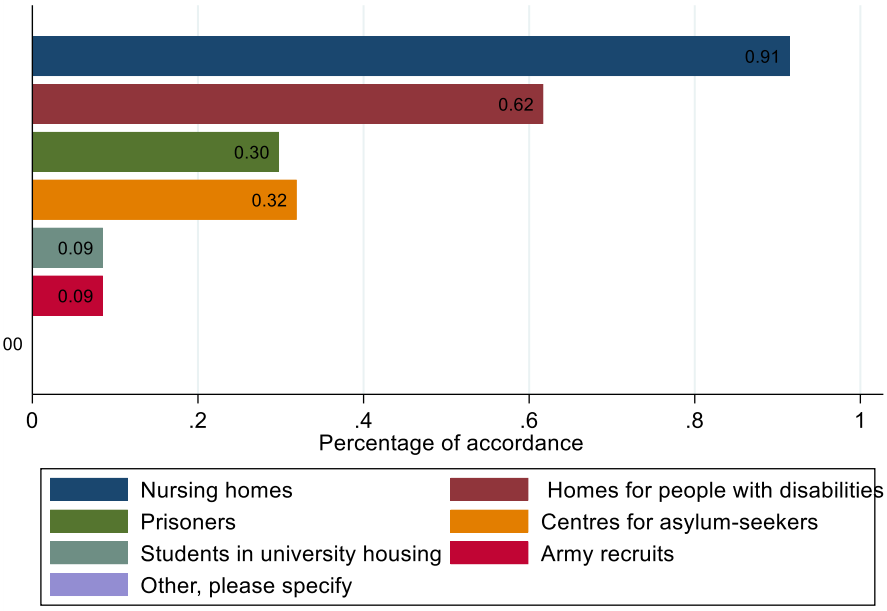


No opinion: n = 0
No answer: n = 0

f Other, please specify:

It will depend on availability of **efficacy data**. People with risk factors for who Phase 3 trials have demonstrated short term efficacy should be the priority and closely monitored for safety and duration of protection.

15. **f vaccines are available in limited quantities, ho should be vaccinated in priority among people living in residential settings here social distancing is**



No opinion: n = 2
No answer: n = 0

16. *Background: There are approximately 5.4 million people aged 18 to 64 years in Switzerland.*

f vaccines are available in limited quantities, hich people 1-- years should be vaccinated, apart from health-care professionals

Those at high risk as defined by the FOPH (approximately 1 million people)

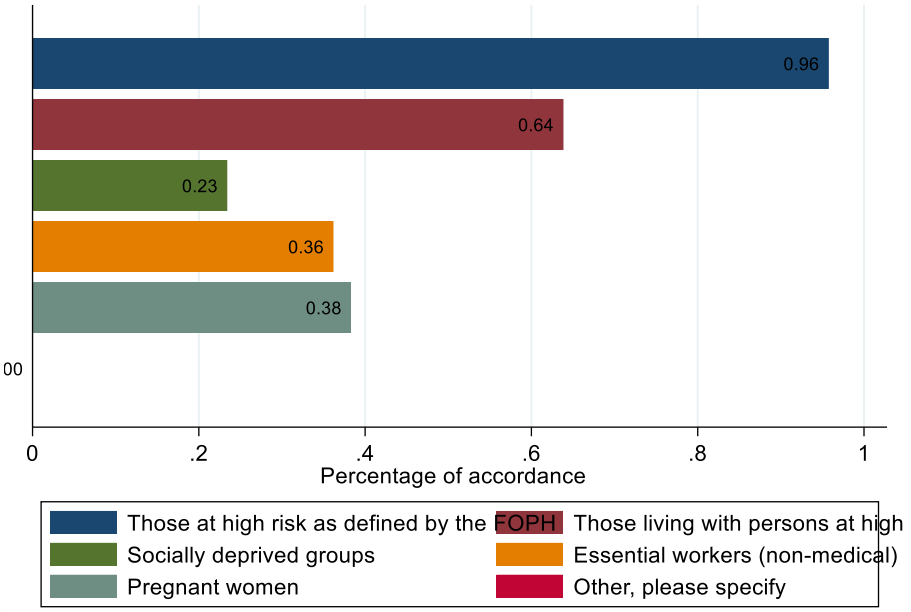
Those living with persons at high risk as defined by the FOPH

Socially deprived groups (homeless, living in shelters, etc.)

Non-medical essential workers in contact with public (security, defense, food and agriculture, education)

Pregnant women

Other: Please specify



No opinion: n = 0
No answer: n = 0

17. *Background: There are approximately 1.6 million people aged < 18 years in Switzerland.*

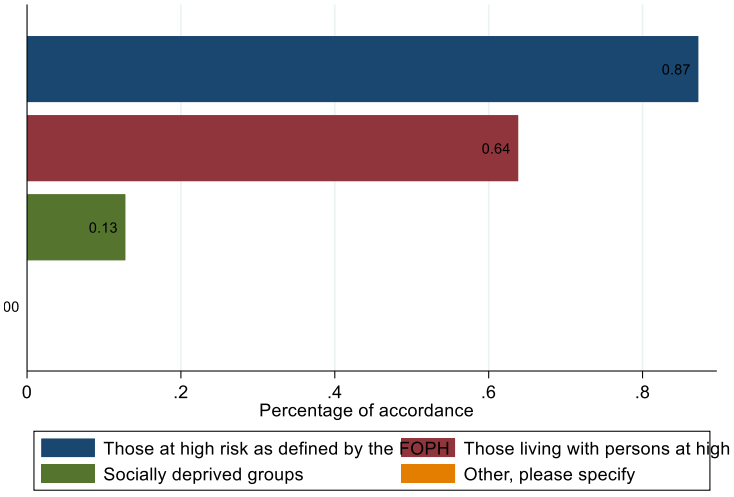
□f vaccines are available in limited quantities, □hich people under 1□ years should be vaccinated□

Those at high risk as defined by the FOPH

Those living with persons at high risk as defined by the FOPH

Socially deprived groups (living in shelters, etc.)

Other: Please specify

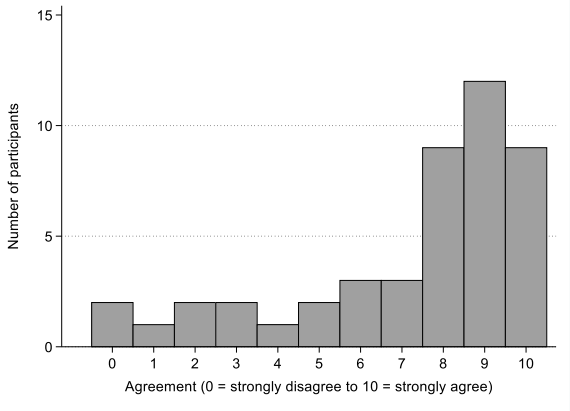


No opinion: **n □1□**
No answer: n = 0

C Strategies for vaccine deployment and administration

18. *Background: Mass vaccination campaigns are frequently employed in developing countries as a means of rapidly vaccinating large numbers of healthy people with a limited supply of health professionals. Cantonal health authorities might consider dedicating all non-emergency staff to vaccination for a short period to rapidly increase herd immunity (e.g. one to two weeks).*

If a large number of doses become available at once (i.e. [illegible]), and healthy individuals are targeted for vaccination, a COVID-19 vaccine should be deployed by a mass campaign



Median 8, IQR 6–9 (Mean 7.3)

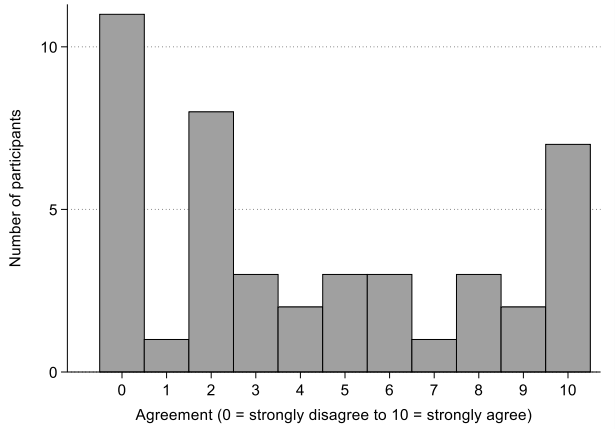
No opinion: n = 0
No answer: n = 1

Comments:

Although I fully agree that a mass vaccination campaign is the most efficient tool, I know for certain that a proportion of the population will want to be immunised by their own physician. This aspect should be taken into account.

Regarding the data it would seem more sensible to vaccinate the patients at risk - seen that most of the patients (80%) do not get seriously ill and that the long-term effect of the vaccination will not be known until several years... The idea of imposing a mass vaccination in the actual setting does not seem to be socially and ethically acceptable - seen the risk-benefit-analysis for the individual person - and I find it questionable to impose it for the 'sake' of our economic systems...

19. **A COVID-19 vaccine should only be administered with a prescription by a medical doctor**



Median 3, IQR 0.5–8 (Mean 4.2)

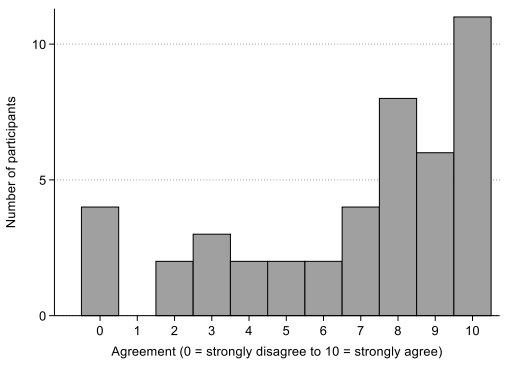
No opinion: n = 2
No answer: n = 1

Comments:

Life vaccine should not be administered without medical prescription but this could be considered for **inactive** vaccines

20. *Background: Pharmacists are allowed to administer a limited number of vaccines without a prescription from a physician, such as the measles-mumps-rubella vaccine, flu vaccine and tick-borne meningoencephalitis vaccine.*

harmacists should be allo ed to administer a novel COV -1 vaccine ithout a prescription by a medical doctor

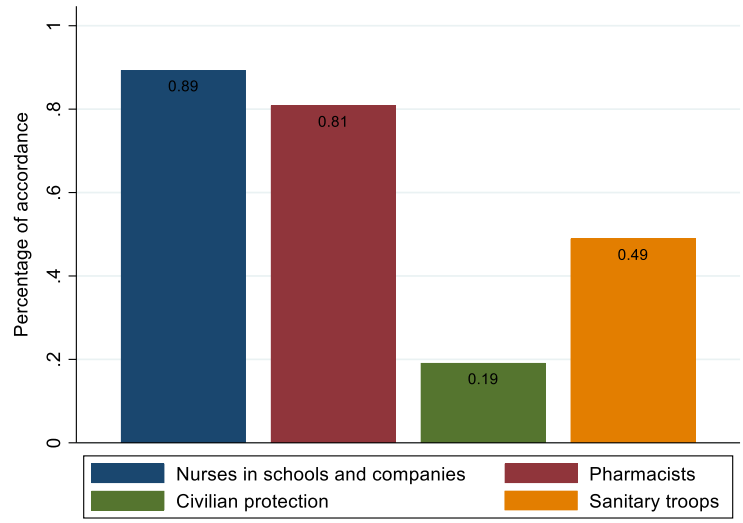


Median 8, IQR 4.5–9.5 (Mean 6.8)

No opinion: n = 2
No answer: n = 1

21. *Background: It may not be feasible to rapidly deliver a large number of vaccines in hospitals, clinics and doctors' practices alone.*

hich groups should be allo ed to administer a COV -1 vaccine ith a prescription by a medical doctor



No opinion: n = 4
No answer: n = 1

Comments:

A medical evaluation will prove necessary in case a risk group vaccination strategy is implemented. Otherwise vaccination administered by nurses, pharmacists, or any type of trained personnel is acceptable

If the strategy of immunization **priorities is clear**, there is not necessarily a need for medical endorsement.

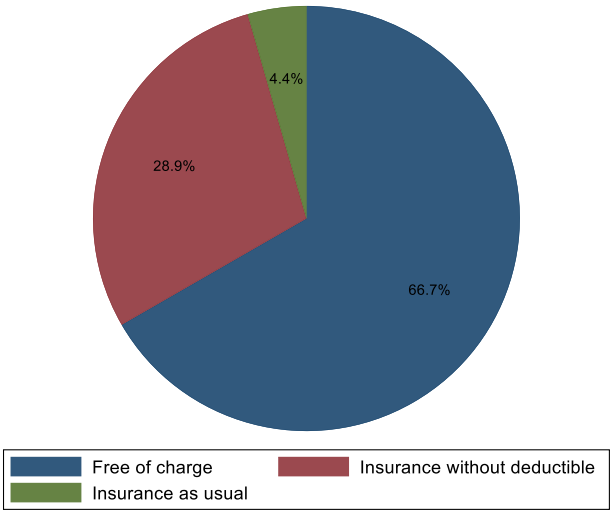
22. *Background: The vaccine is expected to cost less than 30 CHF per dose.*

A COV□□-1□ vaccine should be available:

Free of charge (patient pays nothing, cost covered by insurance at the government)

Reimbursed by basic health insurance without deductible (patient pays only 10% participation)

Reimbursed as usual by basic health insurance (patient pays full cost if they have not reached their annual deductible, and 10% participation after their deductible has been reached)



No opinion: n = 1
No answer: n = 1

Comments:

Vaccine recommendation should be initially conservative and allow for post-licensure studies. People who belong to groups for which vaccines are recommended should be covered by their insurance on the same model as for other vaccines recommended by the Federal Commission for Vaccination.

In my opinion, it is very important that the vaccine be very easily accessible, so free of charge.

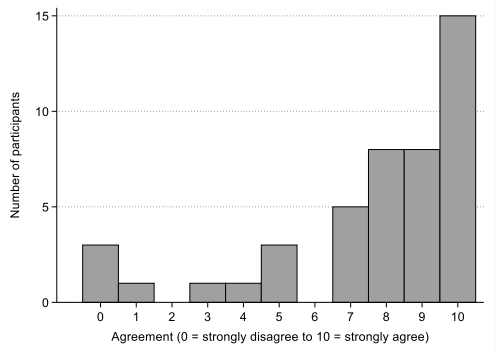
Comments on Section C, □Vaccine deployment and administration□

I feel uneasy with this set of questions because most of them imply that one hundred per cent of the population would be requiring vaccination, i.e. regardless of risk group strategy.

Question 18-20 (Mass campaign, prescription, pharmacists): difficult to answer as it depends on the **type of vaccine**.

□□Strategies for improving the acceptability of a COV□□-1□ vaccine in priority groups

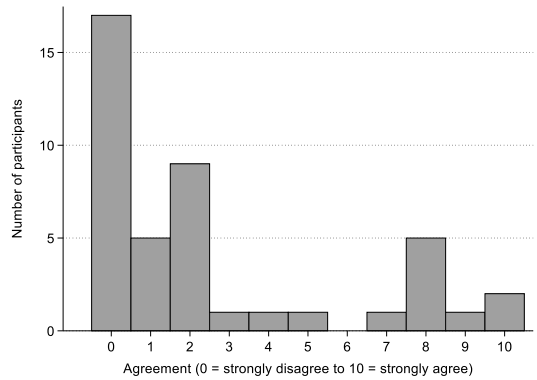
23. **The Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should provide positive incentives to encourageCOV□□-1□ vaccination**



Median 9, IQR 7–10 (Mean 7.6)

No opinion: n = 1
No answer: n = 1

24. **The Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should provide negative incentives to encourage a COV□□-1□ vaccine**



Median 1, IQR 0–4 (Mean 2.6)

No opinion: n = 3
No answer: n = 1

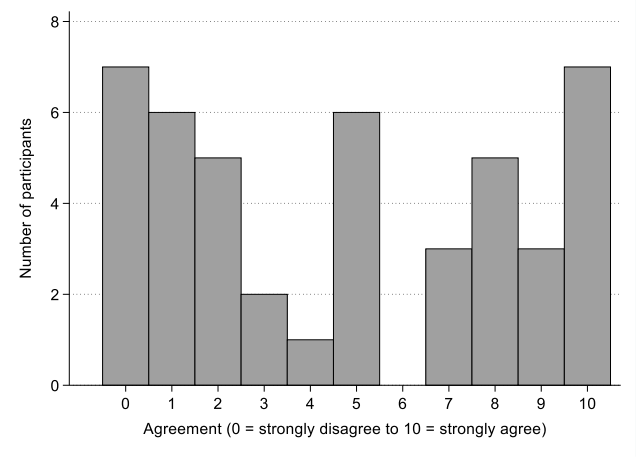
Comments:

I'm not sure I correctly understand the question. If a negative incentive is to let people know how bad they are for them or for others □**hen unvaccinated** I would then strongly disagree (0.000).

I don't quite understand this question... negative incentives from the BAG?

25. *Background: while no individual can be forced to receive vaccination, it could be made obligatory, for example, to be able to continue working in a certain role or attending classes in school.*

Vaccination should be obligatory for certain groups



Median 5, IQR 1–8 (Mean 4.8)

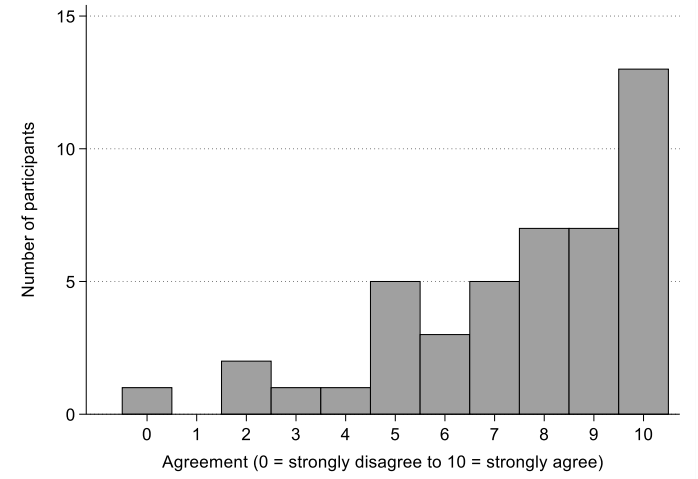
No opinion: n = 1
No answer: n = 1

Comments:

Depends very much on **safety and efficacy** of the vaccine

Compulsory vaccination for visits in bars, clubs, dancing? Id. for visitors in homes or institutions housing **high risk** persons?

26. **egarding responses to anti-vaccine conspiracy theory, the scientific community should deliver messages specifically addressed to groups opposed to vaccination in general**



Median 8, IQR 6–10 (Mean 7.5)

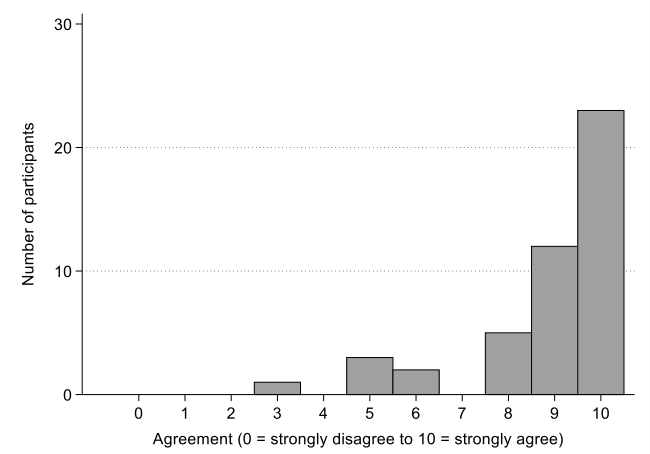
No opinion: n = 1
No answer: n = 1

Comments:

Yes, but let's save our strength for people who are **able to change their mind**.

27. *Background: Vaccine acceptance among healthcare providers is important not only for high rates of protection in this key group, but also given their influence on the general population.*

To address vaccine hesitancy among healthcare providers, the Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should establish an ongoing collaboration □ith professional organizations of frontline providers for the development of a vaccination strategy



Median 9.5, IQR 9–10 (Mean 8.9)

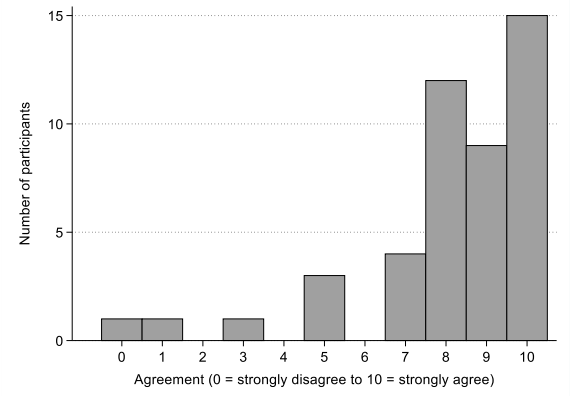
No opinion: n = 0
No answer: n = 1

Comments:

That's very important, to keep the **patients safe** too!

28. *Background: Social media could provide early information for how vaccination-related communication efforts are perceived in different population groups.*

The Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should devote resources to the analysis of conversations on social media to assess public perception of COV□□-1□ vaccines and continuously improve its communication strategy



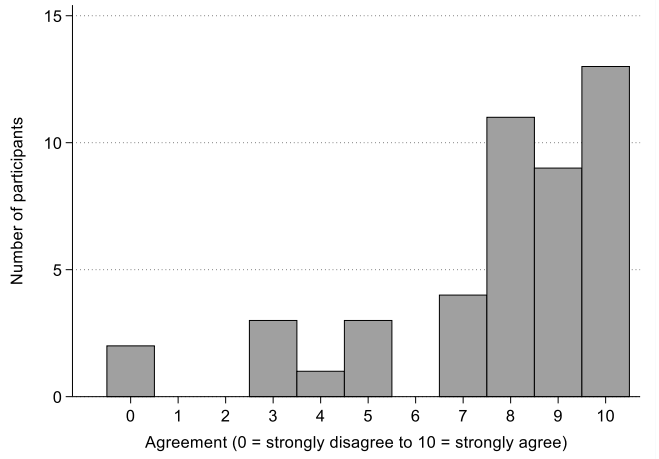
Median 9, IQR 8–10 (Mean 8.1)

No opinion: n = 0
No answer: n = 1

Comments:

Very good idea to use the social medias.

29. **Healthcare professionals should receive specific training in how to discuss a COVID-19 vaccine with patients, with special attention to those who are hesitant to receive such a vaccine**



Median 8, IQR 7–10 (Mean 7.7)

No opinion: n = 0
No answer: n = 1

Comments:

Communication is also very important

Comments on Section C, Improving acceptability:

Specially toward Vaccine **hesitant** people.

To be accepted by the population, vaccine should be **effective**

Given the number of **uncertainties** linked to vaccines evaluated over a short time frame, communication should be very **measured** and acknowledge the need to continue **accruing information**. In parallel, **monitoring misinformation** will be critical so the very measured advice from the authorities keeps being explicated as **transparently** as possible and non-constructive messages countered with rational arguments.

The acceptability needs in first case to be enforced with **good evidence and proofs** of real benefit and no harm - marketing is only a subsequent secondary issue and should not be valuated more than the real proven benefit that can be expected - it needs to be compared/valuated which value rises from the vaccination for the management of SARS-CoV-2 - not on hypothesis but on facts and logical comprehensive data.

There is a fine line between "improving acceptability" among the population and doing a society-wide, **mass experiment** on a vaccine that is new and has not been tested well, yet. Vaccination should **never be the only prevention** strategy communicated to the population, basic and less costly hygienic measures like hand washing or mask wearing should always also be addressed. It is important to continue honest information of the public about the **side effects** of vaccines as well as participatory discussions concerning vaccination. There should **not** be a top-down approach which installs **only positive** communication on vaccines. People have been living with uncertainty as well as contradictory information throughout the pandemic and should be seen as capable of taking **informed decisions** jointly with health professionals. Vaccines are seen as a **panacea** to the pandemic, and are likely to be presented as such by governments who want to improve acceptability. Unfortunately, vaccines are rarely a simple solution, and an honest discussion about pros, cons, priorization and difficult choices are central.

FOPH is **not empowered** to provide any incentives, it is up to the government.
I am hesitant to spend to much efforts and resources on **anti-vaccine** groups as believe does not stand for arguments (see across the Atlantic). **Communication**, however, is vital for the general population and making the vaccine **mandatory** for certain groups of the society when carrying out their duties is welcome, i.e. those at highest risk to infect others should be urged to get a **safe** vaccine, otherwise removed from first-line dealings with potential patients.

Are there additional statements or sections that you think should be addressed in □ound 2 of the □elphi process□

Excellent questionnaire.

Congratulations for imagining & setting up this Delphi process! Excellent piece of work! Thanks. BV In view of the vast number of ongoing studies with various products, have you considered the eventuality that we end up with **three □types□ of vaccines**: Vaccines efficient for preventing the **upper** respiratory infection (would then essentially curb viral transmission between individuals). / Vaccines efficient for preventing the **lo□er** respiratory infection. / Vaccines efficient for preventing the **viremia** & its chain of physiopathological (mostly inflammatory) complications. Resorting to either one of the last two "types" of vaccines should then be dependent on risk factors that have been identified in COVID patients.

Vous auriez dû poser la question suivante : **vous feriez vous vacciner** si un vaccin anti-COVID sortait demain ?

Vaccines will be on piece of the response against COVID-19. The risks of rapid **large-scale** use of products with limited records of safety and efficacy should be cautiously considered in light of **prior fiascos** such as the **1□□□ s□ine flu** vaccination, **2□□□ □1N1** Pandemrix vaccine or more recent mass vaccination against **dengue** in the Philippines. Brisk use of vaccines has the potential to **damage** public health much more and **affect confidence** for many other important vaccines.

Relationship between **vaccination** strategies and **confinement** policies of particularly vulnerable populations.

I think that the vaccination issue needs to be put in its social context - what **effect** can have **various measures** on the spread of the virus - which **cost□efforts** (economic, societal, comfort, reorganizational issues) will have to be maintained in view of uprising and frequent new viral epidemics - which ones **could be abandoned** if an intelligent vaccination strategy is applied... e.g. will we really need to **maintain** expensive and logistic exhausting **tracing-strategies** if risk population is vaccinated? Do we really **need** to have a **high** percentage coverage to prevent the problem of **under capacities** in hospitals/ICUs? Critical questions should be allowed and investigated...

How to establish a dialogue with society/different parts of the population to get to know more about their specific **needs** in a communitarian, **bottom-up** approach.

Compulsory vaccination for visits in bars, clubs, dancing? Id. for visitors in homes or institutions housing **high risk** persons?

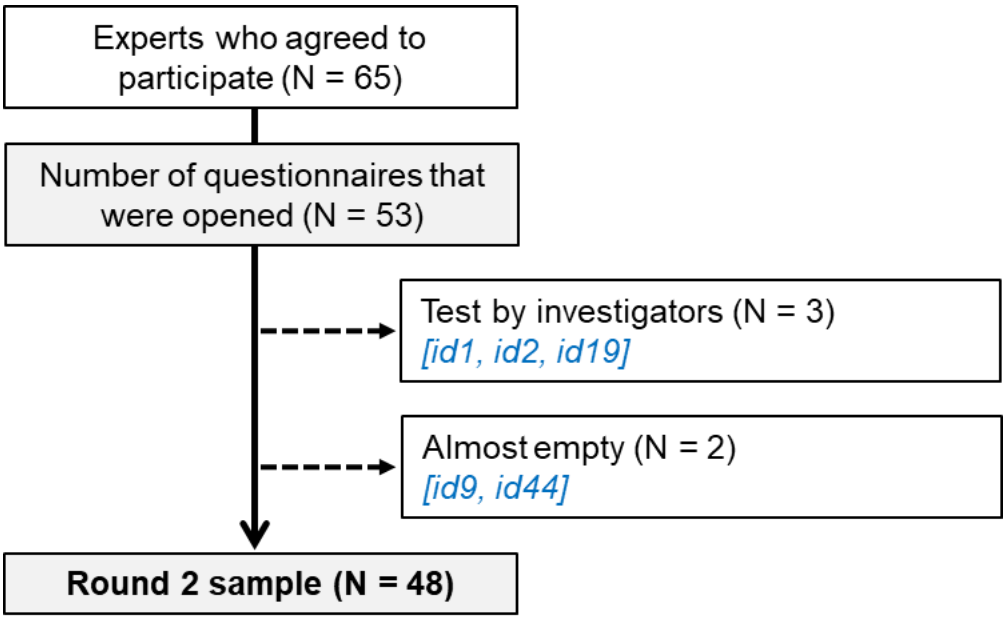
COV□□-1□vaccine deployment in S□itzerland: a □elphi consensus process

Second □ound □esults

Final version 1□□11□2□2□

□articipants

The final sample for this second round is 48 participants. All questionnaires are fully completed.



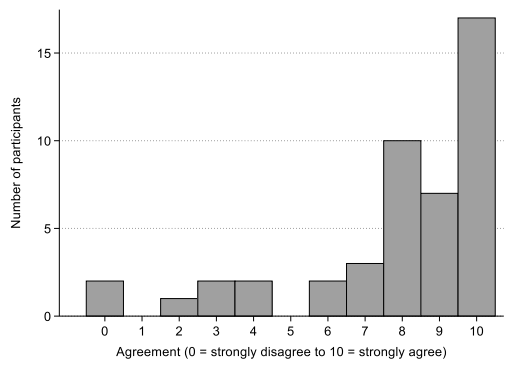
Responses with a median ≥8 and a 25th percentile ≥7 are considered as reaching consensus and scores are highlighted in green.

A Vaccine characteristics

1. 1st round results: Results were mixed regarding the level of efficacy needed to justify widespread implementation. 60% of respondents were in favour of ≥80% efficacy if a vaccine protects less than 6 months (excluding those with no opinion). However, 52% felt ≤50% efficacy was sufficient if a vaccine protects for ≥1 year, thus aligning with the minimum efficacy chosen by the EMA and FDA. Several participants noted that the duration of protection, while important, will not be known from phase 3 trials results and cannot be incorporated into current decision-making.

Background: Vaccine efficacy is the percentage reduction in confirmed symptomatic COVID-19 cases in the vaccinated group of people compared to an unvaccinated group. Here we assume vaccine efficacy in phase 3 trials will be statistically significant (p< 0.05).

Assuming the duration of protection is unkno n, a vaccine should have at least % efficacy to ustify idespread implementation



Median 9, IQR 7–10 (Mean 7.9)

No opinion: n = 2

Comments:

50% efficacy could be a double-edged sword. In case vaccine use is associated with less attention to barrier measures, this could lead to more cases. In addition, not understanding the long-term impact of vaccination on the immune response could place vaccine recipients at higher risk of severe disease a few years later.

No, if efficacy for severe COVID-19 is higher.

Similarly, important would be if the vaccine prevents from severe courses, then even lower efficacy would be acceptable for high-risk groups.

If efficacy lasts ≥ 1 year.

I think efficacy should be higher to justify widespread implementation.

As efficacy may decline over time it may result in a very low protection > 6 months.

50% in older adults will not be enough.

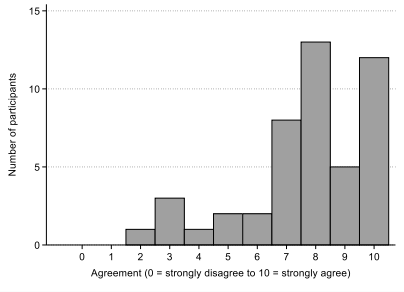
Data at 3 months should be available. Based on the preliminary efficacy data, i.e. 90%, it is likely that an efficacy greater than 50% will be observed also 3 months post vaccination.

2. 1st round results: 24% of respondents would accept intermediary phase 3 results from ≥10,000 participants, 32%from completed phase 3 with ≥30,000 participants, and 37% wanted data from multiple completed phase 3 trials. Participants felt the level of certainty needed would depend on the population being vaccinated and correctly noted that only half of participants are in the active arm and get vaccinated.

Background: The degree of certainty regarding the absence of serious adverse events from a new vaccine will depend in part on the number of people vaccinated. Most vaccine-related serious adverse events occur within 7 days of receiving a vaccine dose.

a COV -1 vaccines should only be idely implemented after safety has been confirmed by a completed phase 3 trial with ≥3 months follow-up after the second vaccine dose for ≥15,000 participants (i.e. a trial with ≥30,000 participants)

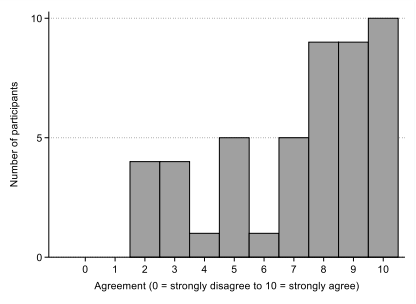
b Earlier use based on intermediary results of phase 3 trials ould only be ustified in volunteers at high risk of severe COV



a.

Median 8, IQR 7–10 (Mean 7.7)

No opinion: n = 1



b.

Median 8, IQR 5–9 (Mean 7.1)

No opinion: n = 0

Comments:

Short-term safety data would be adequate with such numbers, yet long-term monitoring will be essential to exclude delayed effects.

The U.S. Food and Drug Administration requires at least two months of safety data after a full vaccination regime to review applications for emergency use authorization of an experimental vaccine. If the company is in negotiations with FDA over 2 months follow-up data, month 3 follow-up data might be retarded (as no additional value for a company). This might be an issue.

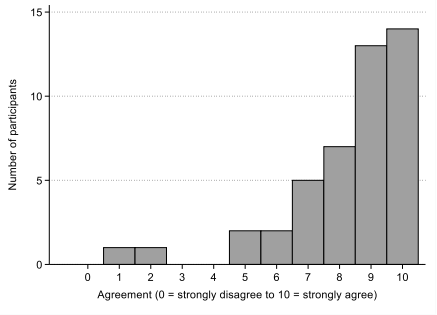
For (a), the assumption is that side effects may boost anti-vaccine campaigns beyond control. And for (b), means that would NOT be justified in ANY case.

Voluntary vaccination could be allowed (people at medium-high risk for COVID/highly exposed personnel) based on personal motivation.

As long as volunteers are acknowledged on intermediary results, earlier use/compassionate should be considered!

3. In Round 1, 56% of respondents did not have a preference between vaccine types prior to phase 3 trial results. Results for the other 44% were split between vaccine types.

If multiple vaccines are available, we should accept whatever vaccine types have been proven to be efficacious and safe in completed phase 3 trials



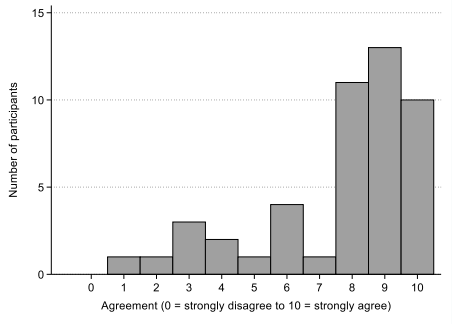
Median 9, IQR 8–10 (Mean 8.3)

No opinion: n = 3

Viral vector-based vaccines should have the lowest priority base on the rapid development of anti-vector immunity which will prevent late boost of the vaccine.

4. In Round 1, only 9% of respondents would trust a vaccine from Russia and 14% from China. Free-text responses favoured trusting Swissmedic.

Background: Experts suggested that special care should be taken when considering the approval of vaccines tested and produced by in Russia and China. Nonetheless, **we should accept whichever vaccines are deemed efficacious and safe after evaluation by Swissmedic, regardless of the provenance of the vaccine**



Median 8, IQR 6–9 (Mean 7.7)

No opinion: n = 1

Comments: Would have more confidence in EMA, FDA. Given the high level of pressure to provide a vaccine and financial implications, if we want the population to trust the vaccine, international trials and validation seems compulsory. Swissmedic should publish review of his experts and raw data from publications should be published and analysed by independent experts. For vaccines from Russia and China, I do not think that a Simply review of the regulatory dossiers will be sufficient to launch large vaccination campaign. As long as good manufacturing practice (GMP) are certified.

Comments on Section A, Vaccine characteristics

Efficacy taken in isolation could be misleading. If a stepwise introduction strategy is retained in order to better manage safety, it would be important that this be based on data from the priority groups that would be selected to receive vaccination. The main concern is about older people in case insufficient data is available from this group and protective efficacy extrapolated from age groups with stronger immune response.

One of the factors will also be the price. A cheap vaccine might be considered if safe, even if not as efficacious than another vaccine.

B: □riority groups and groups requiring special attention

5. Round 1 results from 47 respondents:

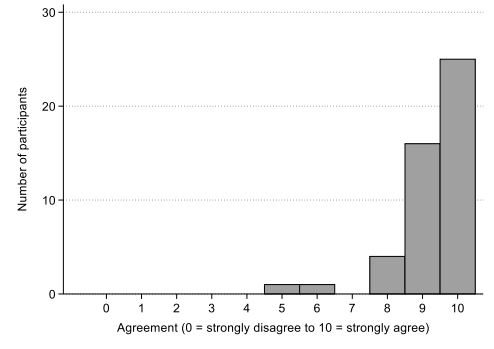
	1st place	2nd place	3rd place	4th place	≥ 5th place
Frontline healthcare prof.	25	10	1	4	7
≥65 years with ≥1 risk factors	13	19	5	0	7
< 65 years with ≥1 risk factors	1	5	12	9	20
Essential workers	3	6	8	7	23
Pregnant women	1	2	7	12	25
≥65 years regardless of risk factors	0	0	12	14	21
People 20 to 35 years	0	5	2	3	37

Background: It is unclear how many vaccine doses will initially be available in Switzerland. We should assume that during the beginning phases there will not be sufficient vaccine doses for all those who desire vaccination. The proportion of people who will accept vaccination in each subgroup is unclear at this time.

a□In the first phase, we should vaccinate frontline healthcare professionals and people ≥65 years old with ≥1 FOPH risk factors□

b□After vaccinating frontline healthcare □orkers and people ≥65 years old with ≥1 FOPH risk factors (first phase), □hich of the follo□ing groups □ould you vaccinate in the second phase□ This is assuming the t□o remaining groups □ould be vaccinated in the third phase (i□e□still before the general population)□

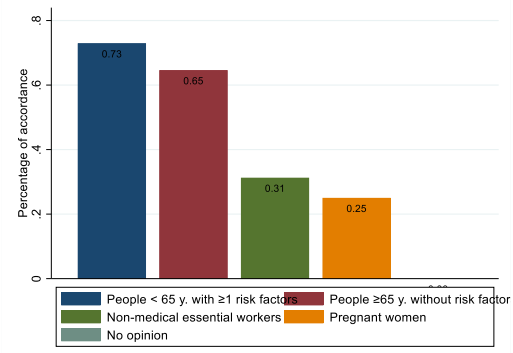
c□After vaccination of these priority groups, □e should aim to vaccinate as large a portion of the population as possible□



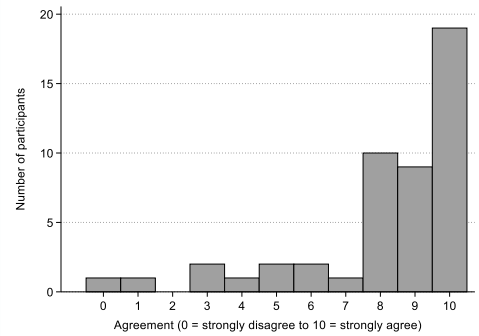
a.

Median 10, IQR 9–10 (Mean 9.3)

No opinion: n = 1



b.



c.

Median 9, IQR 8–10 (Mean 8.1)

No opinion: n = 0

Comments:

I am neutral, this is difficult to answer without efficacy and safety data concerning the vaccine.

I would priories also non-medical essential workers (first of all teachers) before vaccinating a large portion of the population.

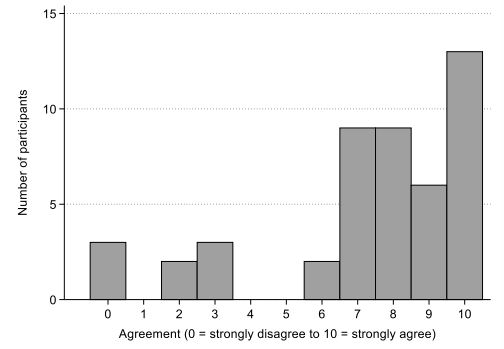
If circulation of the virus in the non-vaccinated low risk population could provide a good societal immunity, it would be better and more efficient to protect the risk population by the vaccination and achieving a rapid natural immunity of the greater part of the society - as most of the cases only have very few symptoms and would have a negative cost-risk-adverse-effect vs benefit balance.

6. Results regarding which age to begin vaccinating children and adolescents were mixed: 29% of respondents were in favour of beginning vaccination at age 6 or before, 32% at age 12, and 16% at age 18. 23% replied ‘other’, with responses that varied widely.

a□□ idespread vaccination of children and adolescents should not be an early priority

b□Adolescents bet□een age 12 and 1□ years should be vaccinated during early phases if they have ≥1 FOPH risk factors

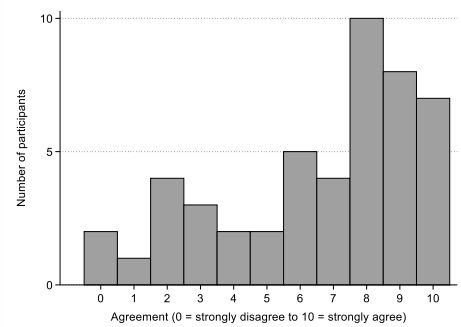
c□The decision to vaccinate children □ 1□ years □ill depend in part on the vaccine platform being considered□Among children and adolescents, non-replicating viral vector or m□NA platform □ill require additional safety data as compared to recombinant protein and inactivated virus vaccines to ensure safety



a.

Median 8, IQR 7–10 (Mean 7.3)

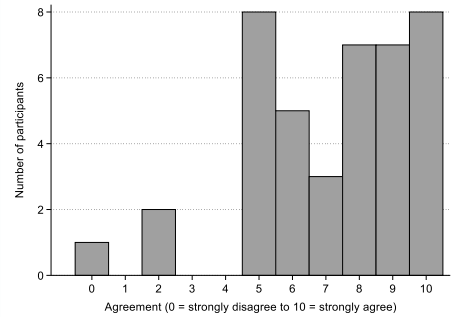
No opinion: n = 1



b.

Median 8, IQR 4.5–9 (Mean 6.6)

No opinion: n = 0



c.

Median 8, IQR 5–9 (Mean 7.2)

No opinion: **n** □ □

Comments:

The low risk of severe disease and unknowns about long-term effects of vaccines warrant a very cautious approach to vaccination in those age-groups.

I am not familiar enough with the implications of these different types of vaccines.

In mortality data for Switzerland, age is THE predominant risk factor and those < 18 years have a minute risk of dying (0.1% incidental risk of dying - if I understand the BAG data table correctly). It has to be said though, that data on children and adolescents are scare, because they were not tested for a long time. So - in my view, risk factors should not play a role for prioritising in those < 18 yo. Daten des Situationsberichts, as of 6.11.2020 https://www.bag.admin.ch/bag/de/home/krankheiten/ausbrueche-epidemien-pandemien/aktuelle-ausbrueche-epidemien/novel-cov/situation-schweiz-und-international.html#2030838475

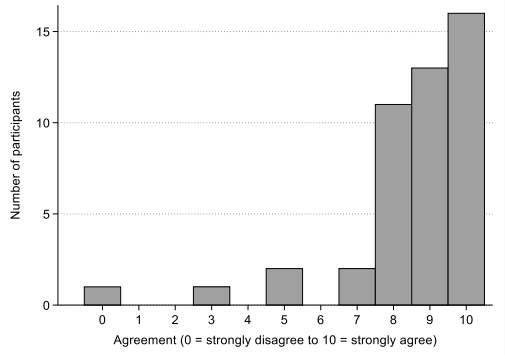
Children are much in contact with their grandparents in our country. Best not to be too restrictive.

If circulation of the virus in the non-vaccinated low risk population could provide a good societal immunity, it would be better and more efficient to protect the risk population by the vaccination and achieving a rapid natural immunity of the greater part of the society - as most of the cases only have very few symptoms and would have a negative cost-risk-adverse-effect-vs benefit balance.

7. 1st round results: Regarding the need for additional data in pregnant women, results were mixed. Excluding those who had no opinion, the proportion of respondents stating that pharmacovigilance data are necessary was: 39% for a recombinant protein subunit, 40% for an inactivated whole-virus, 58% for a non-replicating viral vector, and 67% for an mRNA vaccine.

Background: The decision to vaccinate pregnant women will depend in part on the vaccine platform being considered.

Among pregnant □omen, non-replicating viral vector and m□NA vaccines should require additional safety data as compared to recombinant protein and inactivated virus vaccines to ensure safety and the absence of congenital anomalies or birth defects□



Median 9, IQR 8–10 (Mean 8.5)

No opinion: n = 2

Comments:

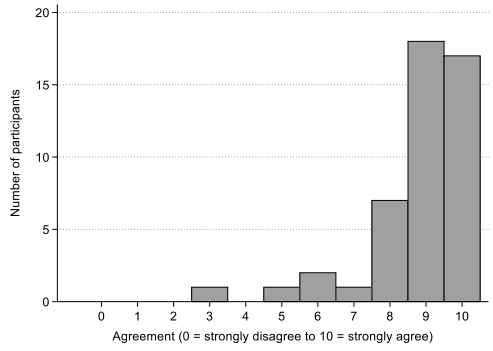
We do not sufficiently understand the biology of those novel vaccines and will need to examine clinical trial data among pregnant women.

How do we suggest to go about gathering these safety data?

I am not familiar enough with the implications of these different types of vaccines.

8. 1st round results: Among people ≥65 years, 86% of respondents would prioritize people with ≥1 FOPH risk factors,60% those in nursing homes, 34% those ≥85 years, 36% those between 75 and 84 years, and 24% those between 65 and 74 years. People in nursing homes are included in question 9.

Among people ≥65 years old, we should first vaccinate those with ≥ 1 FOPH risk factors.

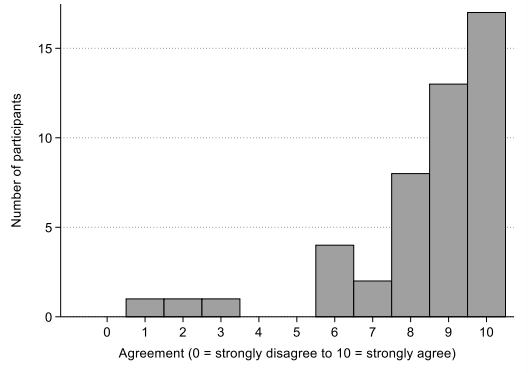


Median 9, IQR 8–10 (Mean 8.8)

No opinion: n = 1

9. 1st round results: Among people living in residential settings, 90% would prioritize nursing homes, 60% homes for people with disabilities, 30% centres for asylum seekers, 28% prisoners, 10% students in universities, 8% army recruits.

Among people living in long-term care settings □here social distancing is difficult, □e should first vaccinate people in nursing homes and care homes for people □ith disabilities□

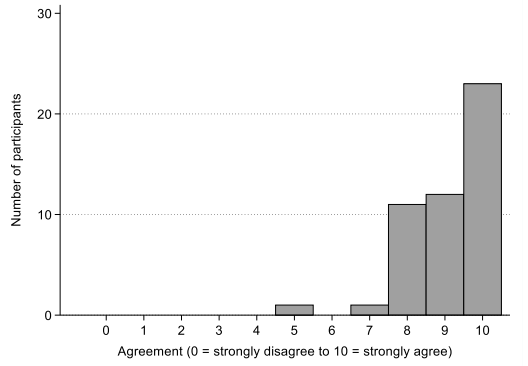


Median 9, IQR 8–10 (Mean 8.4)

No opinion: n = 1

10. 1st round results: Among people 18 to 64 years, 94% would prioritize people with ≥1 FOPH risk factors, 64% people living with someone with ≥1 FOPH risk factors, 38% pregnant women, 34% non-medical essential workers, and 24% socially deprived groups. There were concerns about the potentially large number of people in close contact with someone with ≥1 FOPH risk factors, so they are treated in question 12.

Among people 1□-65 years old, we should first vaccinate those with ≥ 1 FOPH risk factors.



Median 9, IQR 8–10 (Mean 9.1)

No opinion: n = 0

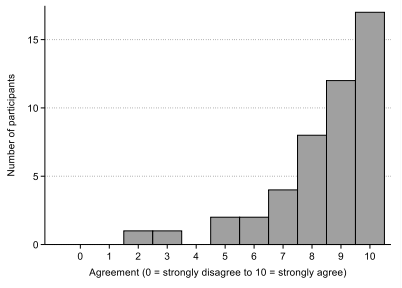
Comments:

After HCP, Consider top priority: HCP with ≥ 1 FOPH risk factors.

Asylum seekers: if other risk factors are present, they should be vaccinated according to the same criteria as non-asylum seekers.

11. 1st round results: Among people < 18 years, 84% would prioritize those with ≥1 FOPH risk factors, 64% those living with someone with ≥1 FOPH risk factors, and 12% socially deprived groups. Again, there were concerns about the potentially large number of children and adolescents in close contact with someone with ≥1 FOPH risk factors, so they are treated in question 12.

Among people □1□ years old, we should first vaccinate those with ≥ 1 FOPH risk factors.

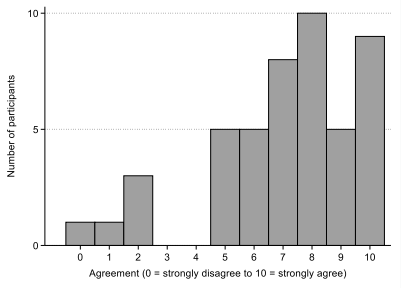


Median 9, IQR 8–10 (Mean 8.4)

No opinion: n = 1

12. 1st round results: 64% of respondents felt that those living with someone with ≥1 FOPH risk factors should be a priority group for early vaccination, even if they are not themselves at high risk. The precise size of this group is difficult to define – many people with ≥1 FOPH risk factors live with others who are also at risk.

People who live with someone with ≥1 FOPH risk factors, but are not themselves at risk, should be vaccinated at the same time as their close contact(s)□



Median 8, IQR 6–9 (Mean 7.1)

No opinion: n = 1

Comments:

Depends a bit whether the vaccine protects from disease or severe course only (then 4) vs. from infection (then cocooning, i.e. 10).

What would the rationale be for that?

Comments on section B: □riority groups and groups requiring special attention:

At time of vaccination, risk factors should be updated based on most recent literature.

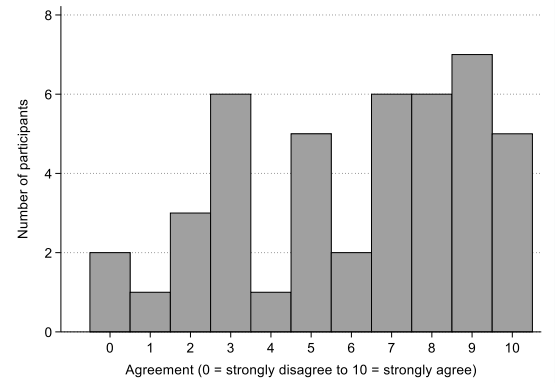
Risk-benefit of vaccination should be the key driver of prioritization together with availability of clinical trial data. It is too early to make any consideration about herd effects as we already see many cases of second infections, some with severe clinical presentation. Only time will tell what we can expect from the different vaccines and, for example, health young frontline workers might not be a priority for vaccination as it is not clear what will be the long-term implications.

C: Vaccine deployment

13. 1st round results: Mixed regarding testing for SARS-CoV-2 antibodies prior to administering a vaccine, with a median of 5, IQR 1-8. Several commented that it depends on the number of vaccines available. People already infected with SARS-CoV-2 have been excluded from most phase 3 trials, such that we know less about the safety of a vaccine in this population. The duration of protection from mild or asymptomatic infection may be shorter than severe infections.

a□□eople should be vaccinated irrespective of previous confirmed or suspected infection □ith SA□S-CoV-2

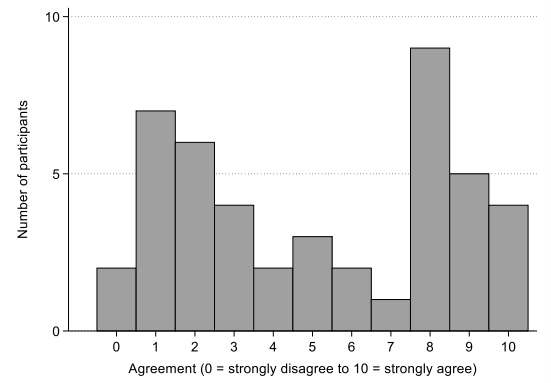
b□□eople should not be tested for SA□S-CoV-2 antibodies prior to immunization, even by a rapid test



a.

Median 7, IQR 3–9 (Mean 6.1)

No opinion: **n** □ □



b.

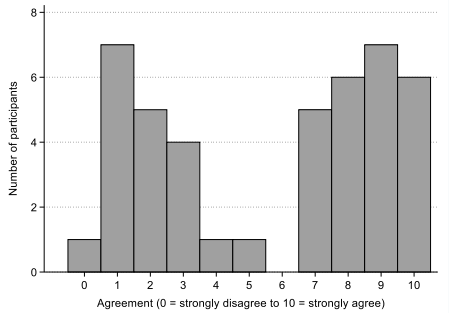
Median 5, IQR 2–8 (Mean 5.1)

No opinion: n = 3

14. 1st round results: Results for giving 1 vaccine dose if 2 are recommended were mixed, with a median of 4.5, IQR 2-8. We are therefore resubmitting this statement with additional information.

Background: Several published phase 3 protocols give 2 vaccine doses, generally 21-28 days apart (ex: Moderna and AstraZeneca vaccines). As such, vaccine manufacturers are likely to recommend 2 vaccine doses. A single dose may not provide protection and will probably provide a shorter duration of immunity. However, 1 dose may be sufficient for many people if the two dose regimen is highly efficacious. The shortage of vaccines is likely to be temporary and eventually a second dose could be given to those initially receiving 1 dose.

f a 2-dose vaccine is available in limited quantities and the efficacy ith 2 doses in phase 3 trials is ≥70%, we should begin by giving 1 vaccine dose to as many people as possible, rather than giving the vaccine to half as many people to ensure 2 doses are available



Median 7, IQR 2–9 (Mean 5.7)

No opinion: **n**

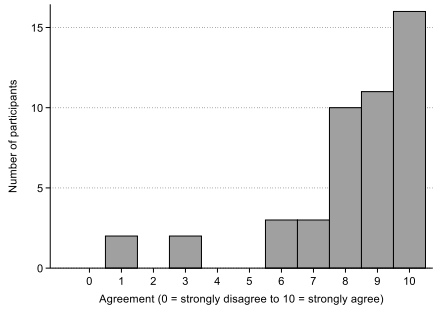
Comments:

Maybe we should be differentiating high risk individuals from regular risk subjects. The former group should receive the number of doses deemed necessary in studies.

15 1st round results: Favoured a mass-vaccination campaign, without achieving consensus. The median score was 8 with IQR 6-9. Free-text comments expressed concerns about lack of data about long-term vaccine side effects and a lack of individualized decision-making in a mass campaign.

Background: Mass vaccination campaigns are frequently employed in developing countries as a means of rapidly vaccinating large numbers of healthy people with a limited supply of health professionals. Cantonal health authorities should consider dedicating all non-emergency staff to vaccination for a short period to rapidly increase herd immunity (e.g. one to two weeks).

Once: 1) vaccines are available in sufficient quantities to offer vaccination to the general population, and 2) additional follo -up of phase 3 trials is available, a COV -1 vaccine should be deployed by mass vaccination



Median 9, IQR 8–10 (Mean 8.2)

No opinion: n = 1

Comments:

Given all uncertainties, mass campaigns would be a recipe for disaster. Each early vaccine dose should be administered to selected individuals very vulnerable to COVID-19 in dedicated settings and allow for careful long-term follow-up.

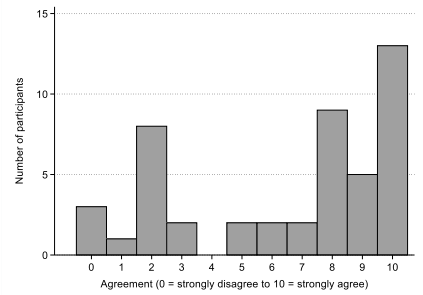
Mass vaccination should not necessarily be opposed to individual vaccination. Both are complementary.

Mass vaccination: if live vaccines are used, the contraindication must still be respected.

16. 1st round results: People were generally against requiring a medical prescription, but did not reach consensus, with a median of 3, IQR 0.5-8. Comments expressed concern that a doctor may be needed to: 1) certify people are from a high-risk group in early phases, 2) allow for insurance reimbursement, and 3) avoid giving a vaccine to immunosuppressed person if a live vaccine is used. Responses also favoured administration by pharmacists, but without a consensus: median 8, IQR 4.5 - 9.5.

a□Once a COV□□-1□vaccine is □idely available, pharmacists should be allo□ed to administer vaccines □ithout a prescription

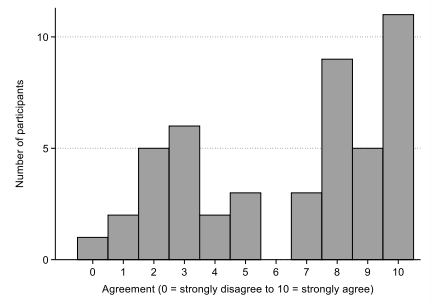
b□COV□□-1□ vaccines should be administered in settings □ith medical supervision, but □ithout the need for individual prescriptions



a.

Median 8, IQR 2–10 (Mean 6.5)

No opinion: n = 1



b.

Median 8, IQR 3–9 (Mean 6.4)

No opinion: n = 1

Comments:

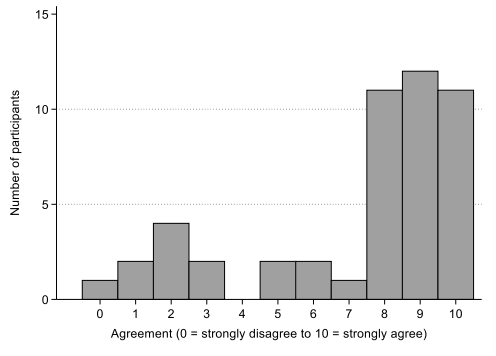
Whatever structure presently deemed adequate for administrating vaccines should remain adequate for administrating a COVID vaccine.

For question a, ok, if there is no contraindication / high risk group.

For question b, that would exclude pharmacies I presume.

17. *New statement* Background: New COVID-19 vaccines may require significant infrastructure to ensure cold chain, information about vaccine side-effects, and to ensure follow-up information.

□hen vaccines first become available they should only be administered at specialized sites □ith sufficient infrastructure to ensure vaccine storage and e□pertise to manage potential vaccine side-effects□



Median 8, IQR 6–9 (Mean 7.3)

No opinion: n = 0

Comments:

Whatever structure presently deemed adequate for administrating vaccines should remain adequate for administrating a COVID vaccine.

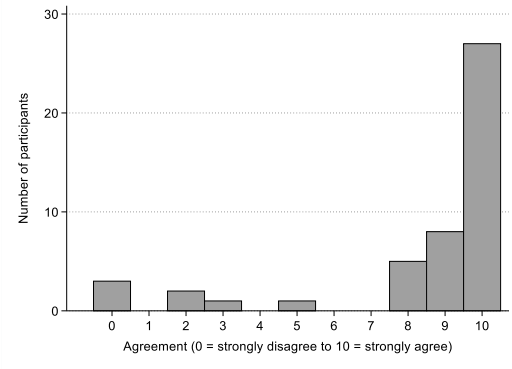
Of course, cold chain assured as necessary.

18. 1st round results: Participants favoured a vaccine being available free of charge: 63% chose free of charge, 32% covered by basic insurance without deductible, and 5% covered by basic insurance as usual. A respondent commented that the vaccine should be covered by basic insurance if the person belongs to a group with a recommendation (similar to other vaccines according to Art. 26 of the KVG / LAMal) as well as being initially available free of charge.

Background: The vaccine is expected to cost less than 30 CHF per dose.

a□Covid-1□ vaccines should be covered by basic insurance □ith a medical prescription (Art□ 2□)

b□□n addition, vaccines should be provided free of charge in the setting of national or cantonal vaccination campaigns

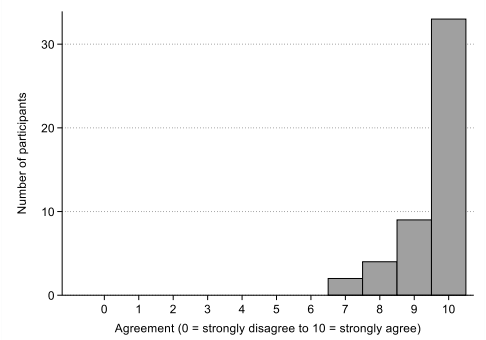


a.

Median 10, IQR 8–10 (Mean 8.4)

No opinion: n = 1

b.



Median 10, IQR 9–10 (Mean 9.5)

No opinion: n = 0

Comments:

It should be free of charge, but covered by insurances, not by government.

Free access to vaccine is part of the national vaccination schedule. This should apply to COVID-19 vaccines as well. Active surveillance of vaccine recipients for health events is warranted to compensate for the brevity of the clinical evaluation. This will incur additional expenses that need to be factored in, especially given that 5 years follow-up will likely be necessary.

At first, need to monitor vaccine deployment to identify and quantify adverse effects.

For sentence (a), if it means that vaccine has to be paid in the absence of a medical prescription: no.

Option 3 is lacing: COVID-19 vaccines should be covered by basic insurance without deductible and without medical prescription.

Because of the franchise vaccine should not be financed via KVG (Federal Act on Health Insurance) but be free of charge.

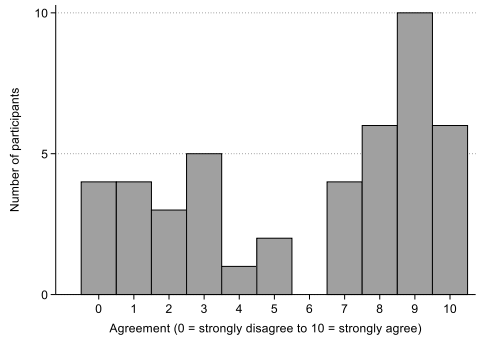
□: □ncreasing vaccine acceptability

19. 1st round results: The use of positive incentives reached consensus, with a median of 9, IQR 7-10. We are therefore providing examples of possible positive incentives to expand on the statement.

The Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should provide positive incentives to encourage COV□□-1□ vaccination□

Examples of positive incentives include:

- A 25 CHF voucher
- Free coffee / meal
- An extra day off work
- A small gift from a local merchant
- Entry into a local lottery (iPad, similar)
- Given a pin, “I got vaccinated”
- An electronic portrait “I got vaccinated” for social media
- ...



Median 7, IQR 3–9 (Mean 5.9)

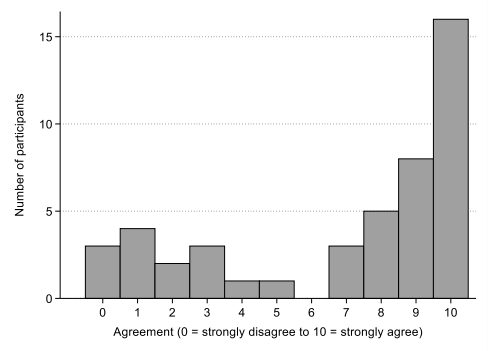
No opinion: n = 3

20. 1st round results: The use of negative incentives reached consensus for disagreement, with a median of 1/10, IQR 0-4. We are therefore providing examples of possible negative incentives to expand on the statement:

The FO□□ and cantonal authorities should avoid using negative incentives to increase uptake of a COV□□-1□ vaccine□

Examples of negative incentives include:

- Being denied access to certain places or events without being vaccinated
- Being forced to wear personal protective equipment more often or for longer
- Financial penalties for refusing vaccination
- ...



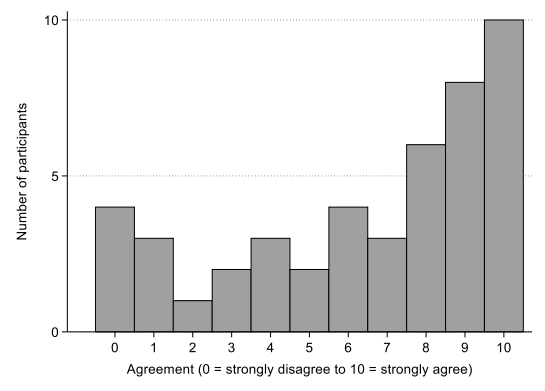
Median 9, IQR 3–10 (Mean 6.9)

No opinion: n = 2

21. 1st round results: Responses were mixed regarding making vaccination mandatory for certain groups, with a median of 5, IQR 1-8. Participants said that a mandate would depend very much on the safety and efficacy of the vaccine. We are re-submitting the statement with a clearer example.

Background: While no individual can be forced to receive vaccination, it could be made mandatory for certain activities, such as for healthcare professionals seeing high-risk patients. Certain vaccines, such as the hepatitis B vaccine, are already obligatory to work in hospital settings in Switzerland.

Vaccination should be mandatory for individuals □ith certain activities, such as frontline healthcare professionals□



Median 8, IQR 4–9 (Mean 6.5)

No opinion: n = 2

Comments:

To make a vaccination mandatory, one would need to have very robust evidence about its innocuity for the vaccine recipient and the value of vaccination in preventing virus transmission. We will not have either in early stages of vaccine availability.

Assuming proven safety.

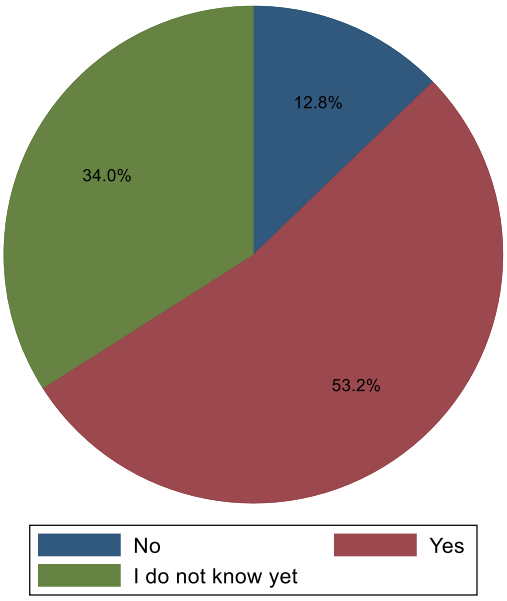
If it is safe and effective.

It does depend on vaccine risks and duration of protection. yearly flu vaccination seems acceptable. repeated vaccinations per 5-6 months seems a lot.

There must be options - as it was the case now - more strict protective measures for example.

It should be highly recommended... avoid "obligation" without educative/informative support!

22.*New question proposed by a participant* **If an mRNA or viral vector vaccine becomes available in early 2021, are you planning on getting vaccination yourself?**



Comments:

Great question. You might be able to refine the question with a number of circumstances that would make it more likely for us to accept vaccination (e.g. studies from international backgrounds proving efficacy/safety, my own antibodies having plummeted...).

Comments on section C: Vaccine deployment:

Given uncertainties for early vaccine adopters, acceptability will depend on excellent risk communication in order to gain community engagement. There should not be any appearance of manipulating individual decisions.

Only with final phase 3 data!

Global comment:

National vs. global allocation would be very timely to probe but may be outside the scope of this study.

Thank you for your work!

Our authorities should consider to consider vaccine-hesitancy, investing and planning educational/information to professionals and the public. For professional: rounds of national educational intervention on how to talk with vaccine hesitant patients. For the public: addressing information in social media, public intervention. University hospital should consider to offer informative consultation to vaccine-hesitant patients. It is time to stop dismiss vaccine-hesitancy patient... and "learn" how to best talk to them. There is science there!

Appendix: Statements which did not require clarification

1. *Background: Vaccine efficacy is the percentage reduction in confirmed symptomatic COVID-19 cases in the vaccinated group of people compared to an unvaccinated group.*

The minimum acceptable efficacy of a COV□□-1□ vaccine to □ustify □idespread implementation □ill depend in part on the e□pected duration of protection□

Round 1 agreement: median 8 / 10 (IQR 7–9).

4. *Background: People who are immunocompromised have been excluded from most phase 3 trials. A vaccine maybe less effective for immunocompromised persons or they could suffer from rare side effects, but they are generally at higher risk of severe COVID-19. There are currently no live vaccines in phase 3 clinical trials.*

□atients □ho are immunocompromised should be offered vaccination, provided there is no formal contraindication□

Round 1 agreement: median 9 / 10 (IQR 8–10). No opinion: n = 2.

27. *Background: Vaccine acceptance among healthcare providers is important not only for high rates of protection in this key group, but also given their influence on the general population.*

To address vaccine hesitancy among healthcare providers, the Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should establish an ongoing collaboration □ith professional organizations of frontline providers for the development of a vaccination strategy□

Round 1 agreement: median 9.5 / 10 (IQR 9–10). No answer: n = 1.

28. *Background: Social media could provide early information for how vaccination-related communication efforts are perceived in different population groups.*

The Federal Office of □ublic □ealth (FO□□□BAG□OFS□□□FS□) should devote resources to the analysis of conversations on social media to assess public perception of COV□□-1□ vaccines and continuously improve its communication strategy□

Round 1 agreement: median 9 / 10 (IQR 8–10).

29. **□ealthcare professionals should receive specific training in ho□ to discuss a COV□□ vaccine, □ith special attention to those □ho are hesitant to receive a vaccine□**

Round 1 agreement: median 8 / 10 (IQR 7–10).