Vaccine Recommendations and Epistemic Competence

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1. Introduction

In this contribution I will start in Section 2 by introducing epistemic competence. I will stress that like Bussmann, I regard it as fundamental that people in a democratic society possess epistemic competence and that it would be important to teach epistemic competence at school. In Section 3 I show that even for countries where the epidemiological situation is roughly the same or very similar such as Austria, Germany and Switzerland, there are often very different recommendations concerning vaccinations. In Section 4 I will identify and discuss five rational reasons that can alone or in combination lead to different vaccine recommendations. Finally, section 5 will reflect on epistemic competence and vaccine recommendations. In particular, I will point out that different vaccine recommendations are an example where students can develop epistemic competence. Further, I will stress that different vaccine recommendations are an example where epistemic competence among the general population is desirable; if it is not present, this can lead to science scepticism and mistrust about science.

2. Epistemic competence introduced

In this section I introduce the concept of epistemic competence, which has been developed by Bettina Bussmann. In Bussmann and Kötter (2018, 93) epistemic competence is defined as "the ability to understand and critically reflect upon aspects of the methods, results, --history and relevance of scientific knowledge in relation to other forms of knowledge." I want to highlight an insight about school education stressed by Bussmann. Namely: it is important that epistemic competence is taught at schools. In this way one can make sure that school children establish a basic methodological understanding about science and its relation to other forms of knowledge, which they will need to be functioning citizens in a democratic society. Philosophy education is a subject where it is possible to teach students epistemic competence and it could provide an important contribution to making sure that students are trained in epistemic competence. Yet, until recently, epistemic competence has not been a field of interest in the didactics of philosophy (see Bussmann 2014).

Needless to say, the didactics of science and philosophy must jointly contribute to developing epistemic competence and in this way advocate an informed discourse about the nature of science while considering the possibilities and limitations of its communication (cf. Bussman and Kötter 2018). An example for teaching epistemic competence given by Bussmann and Leitgeb (forthcoming) is discussing the evidence produced by the methods of randomized control trials, cohort studies, case control studies, expert advice etc. in medicine. Here the aim is that students understand the benefits and drawbacks of the various kinds of evidence produced by these methods.

Developing epistemic competence, critically defending it and highlighting the importance of epistemic competence in school education and in the didactics of philosophy can be regarded as one of the main contributions of Bettina Bussmann's philosophical work. It is a part of her general philosophical stance based on Martens (2003) ideas that sees philosophy as a kind of cultural technique (Kulturtechnik) that provides us with orientation and answers to deal with the complex problems of the world in which we live.

3. Different vaccination recommendations.

Perhaps surprisingly, vaccine recommendations can be different, even for countries where the epidemiological situation is very similar. Let me list a few examples for different vaccine recommendations.

One example is the annual flu shot. Here, for instance, the STIKO in Germany recommends the annual vaccination against the flu for people aged 60 or older and other risk groups (Robert Koch Institute 2023a). The Swiss Impfgremium recommends an annual flu shot for persons older than 65 and other risks groups (Bundesamt für Gesundheit 2023a). The Austrian Impfgremium recommends that everyone older than 6 months is vaccinated against the seasonal flu (Öffentliches Gesundheitsportal Österreichs 2023).

Another example is the hepatitis B vaccination for children. The Austrian Impfgremium, the German STIKO as well as the Swiss Impfgremium recommend an initial vaccination schedule consisting of three shots as a baby (Bundesamt für Gesundheit und Eidgenössische Kommission für Impffragen 2023; Impfservice Wien 2023; Robert Koch Institute 2023b). Yet only the Austrian Impfgremium recommends a fourth booster vaccination between the age of 11-18 (Impfservice Wien 2023).

Yet another example is the Corona vaccination. Here for all persons older than 12 years the Austrian Impfgremium recommends (irrespective of the number of relevant immunological events such as the number of previous vaccinations or number of previous Corona infections) receiving a booster vaccination in fall (Sozialministerium 2023a), while the Schweizer Impfgremium does not recommend such a booster vaccination for healthy adults or children (Bundesamt für Gesundheit 2023b). The STIKO also does not recommend a booster vaccination if one was already exposed to three relevant immunological events, including two vaccinations (Robert Koch Institute 2023c).

As a final example we consider the vaccination against tick-borne Encephalitis (TBE or FSME). Here, after an initial immunization schedule consisting of three vaccinations, the Austrian Impfgremium as well as the German STIKO recommend a booster vaccination after three years and then booster vaccinations every five years (or every three years for persons older than 60 years) (Sozialministerium 2023b; Robert Koch Institute 2023d). The Schweizer Impfgremium differs in their recommendation concerning the booster vaccination, which they only recommend every 10 years (Central Rotpunkt Apotheke 2023).

4. Explanations for different vaccine recommendations

What can explain the differences in vaccine recommendations? Needless to say, one possible reason are irrational factors such as that, e.g., members of the immunization advisory committee are influenced by businesses that produce vaccinations and benefit from selling them. Another irrational reason would be that the members of the immunization committee were overworked and, as a consequence, drew the wrong conclusions from the evidence. There can be a wide variety of such irrational reasons, and they might sometimes play a role. But how often and to what extent they play a role in practice would require a very careful analysis that is beyond the scope of the paper. So, in what follows I will only comment on possible rational reasons. The emphasis is here on "*possible*". To really say what the actual reasons were that lead immunization advisory committees came up with different vaccine recommendations is obviously a question that would require detailed empirical research and access to the relevant decisions made in the committees. Doing this is beyond the scope of this paper. I will now discuss five possible reasons that could lead to differences in vaccine recommendations. I will discuss these reasons in isolation, but it should be kept in mind that they can also be present together. Indeed, it seems likely that, in practice, often several of these reasons taken together will play a role.

First, an obvious reason for different vaccine recommendations in two countries is when there are different epidemiological situations in the countries. E.g., it is not surprising that the Austrian Impfgremium recommends vaccinating against tick-born Encephalitis while Sweden does not: while ticks are prevalent in Austria, they are not prevalent in Sweden. One has to say, though, that for the examples of different vaccine recommendations listed in the previous section the epidemiological situation in the respective countries is rather similar.

Second, another possible reason for diverging recommendations is when the data which are considered to be evidentially relevant (i.e. which experts consider as a basis for making their decisions) differ. For instance, there might one committee that accepts as data about the side effects of a vaccination only evidence resulting from randomized control studies, case-control studies and cohort studies. The second committee might accept all the data of the first committee but, in addition to this, also accept case study reports about single persons on side effects of vaccinations.

Third, even when the data on which the decisions are based are the same, another possible reason for diverging recommendations is when the conclusions drawn from the data are different because different (but still rational) ways of judging or aggregating the evidence are used. For instance, suppose that there were only 4 randomized control studies but 50 case-control studies that assessed the relative benefits and drawbacks of the vaccination. Further, suppose that the case-control studies show a more pronounced effect of saving lives in the vaccinated group than the randomized control studies (that also show an affect, but one that is not so large). Now imagine that there are two immunization advisory panels A and B. Both accept the evidence from the randomized control studies and cohort studies, but panel A places much more emphasis on the results of the randomized control studies than panel B. For instance, it could be that panel A simply follows the dictum that randomized control studies provide the gold standard of evidence because they provide the best way to make sure that there are no factors present that would lead to biased results. Now panel B also values randomized-control studies as a method highly. Yet they argue in the randomized control

studies only healthy individuals were compared and it the case-control studies also people with chronic diseases such as heart disease or diabetes were included and that the general population is more like the one in the case-control studies; hence panel B concludes that the results of the case-control studies should overrule the ones of the randomize control trials). Then, also considering the side-effects of the vaccination and other factors, it could be that panel B arrives at the decision of recommending the vaccination to a specific group of people, while panel A does not.

Other examples were different ways of judging or aggregating evidence could potentially lead to different decisions in vaccine recommendations are when different statistical methods are used (e.g. Bayesian statistics versus methods from classical statistics). Yet another example where different recommendations can arise is when panels consisting of various experts use different decision rules to aggregate the evidence, e.g. majority ruling without a tie-breaker versus majority-ruling with a tie-breaker (where, for example, the head of the committee has the decisive vote when a tie arises).

Fourth, yet another reason that can lead to differences in vaccine recommendations is when there is a difference in the values that provide the basis for assessing whether a vaccination should be recommended or not. For example, values that are normally accepted when considering vaccine recommendations are to save human lives or to prevent the outbreak of serious illnesses. While immunization advisory panels usually will have many such common values they appeal to, there can be differences, especially when it comes to the interests of subgroups of society. Here very difficult questions can arise: e.g., what is the relative importance of preventing deaths of older persons versus preventing rare side effects of vaccinations in healthy adults that would not need the vaccination? Consider, for example, the annual flu shot. Suppose that immunisation advisory panel A considers it more important to prevent deaths among the older population than to prevent rare side effects of the flu vaccination in the healthy adult population. Then panel A might recommend that, in general, all adults should receive an annual flu shot. Now, suppose that immunization panel B regards it as unacceptable that rare side effects are caused to healthy adults that would not need the vaccination even if this means that many older people will be infected by the flu and hence there will be more deaths in the older population. Then panel B might argue against recommending the flu vaccination to all healthy adults.

Other examples where there might be a conflict of interest of different subgroups of society are, e.g., pregnant women versus healthy children (when the question arises whether healthy children should be vaccinated to prevent that pregnant women and their unborn babies are protected) or persons with chronic diseases versus the general healthy adult population (when the question arises whether the general healthy adult population should be vaccinated to prevent deaths among people with chronic illnesses).

Fifth, yet another reason that can lead to different vaccine recommendations is when there is uncertainty about what should be done, and then *additional* values are appealed to do decide one way or the other. For instance, suppose that immunization advisory panel A and B regard the same data as evidentially relevant, use the same ways of judging the evidence and also appeal to the same values as a basis for making their decisions. Then it could be that the evidence simply does not tell you clearly what to do because both decisions, to recommend

the vaccination or not to recommend it, are equally supported by the evidence. That is, there is a situation of uncertainty, and in these situation of uncertainty additional values can and are often appealed to in order to arrive at a decision (see Douglas 2000, 2009). E.g. immunization advisory panel A might decide not to recommend the vaccination because it is costly and then the money can be used for other important purposes. Immunization panel B, on the other hand, might decide to recommend the vaccination because then it is likely that it is less stressful for the health care workers to cope in fall and winter because hospitalization rates will be lower.[1]

5. Conclusion: Epistemic Competence and Different Vaccine Recommendations

Let us take stock. In this contribution we first introduced and highlighted the importance of Bussmann's concept of epistemic competence. Then we listed various examples of different vaccine recommendations for different countries (Austria, Germany and Switzerland). After this we discussed various rational reasons that can lead to different vaccine recommendations. In this conclusion we can now bring the discussion of different vaccine recommendations and epistemic competence together.

My main points are twofold. First, different vaccine recommendations are an example where students can develop epistemic competence. By discussing possible rational reasons for arriving at different vaccine recommendations as outlined above, students can learn important lessons about the methods of science, the interplay between values and science, and the interrelationship between science and policy.

Second, different vaccine recommendations are an example where epistemic competence among the general population is desirable. Without at least some basic understanding of how different vaccine recommendations can arise (and we have seen that there are many such reasons), it can happen easily that immunization advisory committees are wrongly blamed to arrive at irrational decisions. Let me stress here again that I do not make any claims about how immunization advisory committees actually arrived at their decisions, and that I do not want to exclude that in practice there are also cases where different vaccine recommendations arise but not all of them can be rationally justified. The main point here is just that there are many potential reasons why immunization advisory committees can rationally arrive at different decisions and understanding that there are such potential reasons is desirable. Without such an understanding, the methods of science and the interplay between science, values and policy is not properly understood, opening the door for science scepticism and mistrust towards science.

[1] One might wonder whether reason 5 (when there is uncertainty and different values fill this uncertainty, leading to different recommendations) is not the same as reason 4, i.e. when there are different recommendations because different values are appealed to as a basis for the decision. Note, however, that these two cases are different. For reason 4 the values that provide the basis for the decisions are specified in advance, and then it is found that when one appeals to these values, the evidence speaks one way or the other (e.g. for or against recommending a vaccination). For reason 5, it is found that it is not clear what should be recommended because there is uncertainty given the values that were previously agreed to provide the basis for the decision. Because the uncertainty needs to be resolved, it is then decided that *further additional* values can be taken into consideration that lead to a clear decision (e.g. for or against recommending a vaccination).

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List of References

Bundesamt für Gesundheit (2023a). Grippe Impfung. Available at: https://www.bag.admin.ch/bag/de/home/krankheiten/krankheiten-im-ueberblick/grippe.html (Accessed 21 December 2023).

Bundesamt für Gesundheit (2023b). Corona Impfung. Available at: https://www.bag.admin.ch/bag/de/home/krankheiten/krankheiten-im-ueberblick/coronavirus/covid-19/impfen.html#:~:text=Besonders%20gefährdete%20Personen-,Allen%20besonders%20gefährdeten%20Personen%20ab%2016%20Jahren%20wird%20im%20Herbst,von%20der%20obligatorischen%20Krankenpflegeversicherung%20übernommen.&text=Schwangere%20Personen-,Schwangere%20können%20nach%20individueller%20Abklärung%20mit%20ihrer,ihrem%20Arzt%20eine%20Impfung%20erhalten (Accessed 21 December 2023).

Bundesamt für Gesundheit und Eidgenössische Kommission für Impffragen (2023). Schweizerischer Impfplan. Available at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiDr8jpoIqDAxWLQ_EDHZEeDuMQFnoECCcQAQ&url=https%3A%2F%2Fwww.bag.admin.ch%2Fdam%2Fbag%2Fde%2Fdokumente%2Fmt%2Fi-und-b%2Frichtlinien-empfehlungen%2Fallgemeine-empfehlungen%2Fschweizerischer-impfplan.pdf.download.pdf%2Fschweizerischer-impfplan-de.pdf&usg=AOvVaw01kYG_YEcZztG6-dQH6tLl&opi=89978449 (Accessed 20 December 2023).

Bussmann, B. and Leitgeb B. (forthcoming). „Evidenz in der Medizin“. Erscheint in: Bussmann, B./ Mayr, P. (Hg.): Theoretische Philosophie und Lebensweltorientierung. Metzler Verlag 2024.

Bussmann, B. (forthcoming). „Warum lebensweltlich-wissenschaftsorientieres Philosophieren in der Schule notwendig ist. Bildungsphilosophische Legitimation, Klärung von Missverständnissen und ein Anwendungsbeispiel .“ Erscheint in: Christian, A./ Gawel I. (Hg.): Wissenschaftsleugnung – Fallstudien, philosophische Analysen und Vorschläge zur Wissenschaftskommunikation. De Gruyter 2024.

Bussmann, B. (2014). Was heißt: sich an der Wissenschaft orientieren? Untersuchungen zu einer lebensweltlich-wissenschaftbasierten Philosophiedidaktik am Beispiel des Themas ‚Wissenschaft, Esoterik und Pseudowissenschaft'. Berlin: LIT

Bussmann, B. and Kötter, M. (2018). Between scientism and relativism: epistemic competence as an important aim in science and philosophy education. *RISTAL, 1*, 82–101.

Central Rotpunkt Apotheke (2023). Zeckenimpfung FAQ. Available at: https://www.apotheke-thalwil.ch/serviceleistungen/impfungen/zeckenimpfung/zeckenimpfung-faq (Accessed 23 December 2023).

Douglas, H. (2000). Inductive Risk and Values in Science. Philosophy of Science, Vol. 67, No. 4 559-579.

Douglas, H. (2009). Science, Policy and the Value-Free Ideal. Pittsburgh: University of Pittsburgh Press.

Impfservice Wien (2023). Hepatitis B. Available at: https://impfservice.wien/hepatitis-b/#:~:text=beim%20Kind%20verhindern.-,Impf-Empfehlungen%20für%20Kinder,influenzae%20b%20als%206fach-Impfung (Accessed 20 December 2023).

Martens, E. (2003). Methodik des Ethik- und Philosophieunterrichts. Philosophieren als elementare Kulturtechnik. Hannover: Siebert Verlag.

Öffentliches Gesundheitsportal Österreichs (2023). Grippeimpfung. Available at: https://www.gesundheit.gv.at/leben/gesundheitsvorsorge/impfungen/ueberblick/grippe.html#:~:text=Laut%20Impfplan%20Österreich%202023%2F2024,hohem%20Ansteckungsrisiko%20aufgrund%20der%20Lebensumstände (Accessed 20 December 2023).

Robert Koch Institute (2023a). Antworten auf häufig gestellte Fragen zur Schutzimpfung gegen Influenza, Gesamtstand: 28.9.2023. Available at: https://www.rki.de/SharedDocs/FAQ/Impfen/Influenza/FAQ_Uebersicht.html#:~:text=Entsprechend%20den%20STIKO-Empfehlungen%20können,Schwangere)%20sind%20lediglich%20Totimpfstoffe%20zugelassen (Accessed 20 December 2023).

Robert Koch Institute (2023b). Schutzimpfung gegen Hepatitis B: Häufig gestellte Fragen und Antworten. Stand 2.06.2022. Available at: https://www.rki.de/SharedDocs/FAQ/Impfen/HepatitisB/FAQ-Liste_HepB_Impfen.html (Accessed 20 December 2023).

Robert Koch Institute (2023c). Implementierung der COVID-19-Impfung in die allgemeinen Empfehlungen der STIKO 2023 (Aktualisierung Epid Bull 4/2023). Available at: https://www.rki.de/DE/Content/Infekt/EpidBull/Archiv/2023/Ausgaben/21_23.pdf?__blob=publicationFile (Accessed 20 December 2023).

Robert Koch Institute (2023d). Antworten auf häufig gestellte Fragen zur FSME-Impfung

Available at: https://www.rki.de/SharedDocs/FAQ/FSME/FSME-Impfung/FSME-Impfung.html (Accessed 20 December 2023).

Sozialministerium (2023a). Impfplan Österreich. Available at: https://www.sozialministerium.at/Themen/Gesundheit/Impfen/Impfplan-Österreich.html (Accessed 20 December 2023).

Sozialministerium (2023b). Frühsommer-Meningoenzephalitis (FSME). Available at: https://www.sozialministerium.at/Themen/Gesundheit/Uebertragbare-Krankheiten/Infektionskrankheiten-A-Z/Frühsommer-Meningoenzephalitis-(FSME).html#:~:text=Auffrischungsimpfung%20ist%203%20Jahre%20nach,Lebensjahr%20alle%203%20Jahre%20erforderlich (Accessed 20 December 2023).