

Disclaimer: We kindly ask to acknowledge that due to the diverse and heterogeneous nature of the questions and the dynamic pandemic situation some of the information might be incomplete or only correct for the time being. Thus, please consider the date with the below information. All available information was provided by a country representative from the PHIRI network during or in connection to the respective meeting.

Date: 29.08.2022 Updated 06.09.2022

Table 1: Country responses: Cost-effectiveness of vaccines and NPIs

Country	Topic: Cost-effectiveness of vaccines and NPIs <ul style="list-style-type: none"> • What kind of research are you developing in terms of the cost-effectiveness of vaccines and non-pharmaceutical interventions (NPIs) in your country? • In the past since start of the pandemic, has existing evidence on cost-effectiveness of interventions already factored into political decision-making (if so, please provide details)? For future strategies on NPIs in your country, is evidence on cost-effectiveness foreseen to play a role (if so, please provide details)? • Will it be sustainable economically to keep vaccination to the entire population? Will there be priority groups as foreseen in your country?
Austria	<p>There are currently no published or ongoing studies known to GÖG analysing the dimension of cost-effectiveness for COVID-19 vaccines or NPIs in Austria on national level. In the municipality of Vienna, there is one recent local analysis commissioned by the Vienna Chamber of Labour on the cost-effectiveness of the city's PCR testing strategy (link in German: https://news.wko.at/news/wien/2022_Kosten-Nutzenanalyse-PCR-Test.pdf).</p> <p>Existing evidence also from other countries on cost-effectiveness of immunisation programmes in general has factored into introducing the AT COVID-19 vaccine strategy to an extent, i.e. supporting the start of the Austrian COVID-19 immunisation programme, the Austrian National Public Health Institute carried out a literature review of cost-effectiveness studies on other vaccinations on behalf of the MoH, namely influenza, TBE and pneumococcal vaccine.</p> <p>Regarding prioritisation, at the moment a full course of COVID-19 immunisation (following the 2+1 immunisation scheme including a third/booster dose) is recommended for and available to all residents. A fourth dose/second booster dose of available vaccines is currently recommended only to certain groups (immunocompromised people regardless of age, other risk groups above the age of 12, and adults above the age of 60 regardless of additional risk factors), but available to all residents also outside of these groups if desired. This is also currently economically viable, as many surplus vaccine doses still exist.</p> <p>The current = 10/8/22 AT immunisation strategy as recommended by the Austrian Immunisation Committee is available at this link https://www.sozialministerium.at/Corona/Corona-Schutzimpfung/Corona-Schutzimpfung---Fachinformationen.html (in German language).</p>
Belgium	<ul style="list-style-type: none"> • No information could be found regarding the cost-effectiveness of COVID-19 vaccination in Belgium. • The decision to (re-)vaccinate particular groups should always be taken based on the available evidence that exists on protection at that moment in time. This is what LINK-VACC is working on: it periodically reports to the CSS/HGR, Task Force Vaccination, etc., on the current protection that is still offered against (severe) disease, per age group. This guides the decision making process on additional booster doses. <ul style="list-style-type: none"> - LINK-VACC: post-authorisation surveillance of COVID-19 vaccines in Belgium - monitor vaccine uptake/coverage, vaccine effectiveness and vaccine safety (including occurrence of breakthrough infections) https://www.sciensano.be/en/projects/linking-registers-covid-19-vaccine-surveillance - Experts from the LINK-VACC not in favour to continue offering additional boosters to the whole population, if the current levels of vaccination still protect well against severe disease. For groups that are particularly vulnerable (the elderly, people with underlying diseases), the risks are of course different, and the decision should be made separately <p>People with lowered immunity</p> <ul style="list-style-type: none"> - The available data indicate that persons with reduced immunity, caused by a certain condition or by treatment, may be less protected after primary vaccination course with 1 or 2 doses. Recent scientific data shows that in these immunocompromised patients, an additional dose of mRNA vaccine (currently Pfizer or Moderna) can improve the immune response. In Belgium, it was decided to invite these extra vulnerable patients for an extra vaccination dose, in order to optimize their protection against COVID-19. This concerns approximately 350,000 patients with:

	<ul style="list-style-type: none"> - congenital immune disorders - chronic kidney dialysis - inflammatory diseases treated with immunosuppressants - blood cancers or other malignant tumors, which are/or have been in active treatment in the past 3 years - pretransplant, stem cell transplant and organ transplant patients - HIV patients whose CD4 cell count is less than 200 per mm³ of blood - Down syndrome (they are added by the GP. More information: https://www.info-coronavirus.be/nl/vaccinatie-professionelen/#zorgverlener (in Dutch or French)) - who are being treated with certain biosimilars. For more information, see here, in French <ul style="list-style-type: none"> - Residents of nursing homes & care homes - Everyone who has been vaccinated with the Janssen vaccine - People of 65 years and older - Patients in assisted living apartments, day care centres, psychogeriatric facilities and psychiatric care homes <p>You can find more information here: https://d34j62pqlfm3rr.cloudfront.net/downloads/tekst-extraprik-september_EN.pdf</p>
Croatia	<ul style="list-style-type: none"> • Studies on cost-effectiveness has not been conducted or published in Croatia. • Existing evidence on cost-effectiveness was taken into account in decision-making and it is envisaged that it will play a role in further decisions. No restriction on vaccination for the general population is currently being discussed. Considering the lower level of interest. Maintaining vaccination is economically justifiable. • Priority groups are elderly people and groups with chronic diseases, for whom a recommendation for a second booster vaccination came out in August. For the rest of the population, the recommendation is for a 1st booster. Further adjustments or recommendations are currently being discussed.
Denmark	No vaccination is currently recommended for children, except for those at risk.
Estonia	<ul style="list-style-type: none"> • No information about classic cost-effectiveness analysis. Estonian Health Insurance Fund carried out matched cohort study to analyse COVID-19 costs of vaccinated and non- vaccinated individuals. Results show that without vaccination costs would have been 5.46 times higher. https://www.haigekassa.ee/sites/default/files/vaktsineerimise_moju.html (in Estonian) • Different population groups have different targets on vaccination coverage. General goal of the population 12 years and older by the end of 2022 is 75%. The second booster is planned mainly for population 60+ (incl nursing homes) and healthcare/social care workers, but anyone in need or want could have a second booster. Vaccination is for free for everyone until the end of 2022, incl second boosters. https://sm.ee/covid-19-valmisolekukava-20222023-viirushooajaks
Germany	<ul style="list-style-type: none"> • With regard to cost-effectiveness of vaccines, we plan to supplement our COVID-19 vaccination model with a health economic model part. However, this will not be implemented before 2023. • With regard to cost-effectiveness of vaccines, at least RKI has not conducted such evaluations so far. • Since RKI has not conducted such evaluations so far, we cannot answer this question.
Italy	<ul style="list-style-type: none"> • Several studies on COVID vaccines and treatments efficacy have been implemented in Italy (most of them listed in the following web page of the Italian Medicines Agency https://www.aifa.gov.it/en/sperimentazioni-cliniche-covid-19). Fewer studies have been implemented on effectiveness of NPIs efficacy; most of them in collaboration with other countries (as example, Boone L. and Ladreit C. Fear of COVID and non-pharmaceutical interventions: An analysis of their economic impact among 29 advanced OECD countries. Covid economics: vetted and real-time papers. London: CEPR Press, ZDB-ID 3019632-2.-2021, 73 (23.3.), p. 1-40; https://cepr.org/sites/default/files/publication-files/101425-covid_economics_issue_73.pdf); no specific studies on comparison of cost-effectiveness between vaccines and NPIs. • In Italy, with the Decree of the Head of the Civil Protection Department no. 371 of February 5, 2020, the Technical Scientific Committee (TSC) was established with expertise in consulting and supporting coordination activities for overcoming the epidemiological emergency, due to the spread of Coronavirus; the Committee is made up of experts and qualified representatives of the Bodies and Administrations of the State. All the health political



	<p>decisions on the management of the COVID pandemic have been taken on the basis of the scientific and cost-effectiveness information provided by the TSC.</p> <p>The Scientific Technical Committee met for the last time on March 30, 2022. It was dissolved following the cessation of the state of emergency Covid-19, but all the future health political decisions on the pandemic, including strategies on NPIs, continue to be adopted with the advice of the main health authorities (Ministry of Health, Istituto Superiore di Sanità, Italian Medicines Agency), which provide scientific and cost-effectiveness information, also on NPIs.</p> <ul style="list-style-type: none"> • With a circular dated 11 July 2022, the Italian Ministry of Health recommended the administration of a second booster dose (or 4th dose) with mRNA vaccine to all people aged 60 and over, to all frail people of all ages, and to healthcare workers, as part of the vaccination campaign against SARS-CoV-2/COVID-19. The recommendation applies provided that a minimum interval of at least 120 days has passed since the first booster dose or the last infection following the booster (taking as a reference the date of the first positive swab). This gradual approach, which starts from the priority groups and, when necessary, is extended to the entire population, is based on the scientific information, but also takes into account the economic sustainability.
Ireland	<ul style="list-style-type: none"> • If/when the clinical advice on Covid vaccines stabilises and the future Covid vaccination programme options become clearer (i.e. what vaccines, which population cohorts, how often), the Department of Health in Ireland would typically commission a 'Health Technology Assessment' (HTA) through the Health Information and Quality Authority (HIQA), to inform policy. A HTA is a multidisciplinary research process that collects and summarises information about a health technology. The information can cover a range of fields, including clinical effectiveness and safety, cost-effectiveness and budget impact, organisational and social aspects, and ethical and legal issues. The information is collected and presented in a systematic, unbiased and transparent manner. <p>The health budget in Ireland is finite. To invest in a new technology means that it may be necessary to stop or reduce funding for another technology or service. To make that choice, it is important that accurate and reliable evidence is presented to support decision making. The goal of HTA is to provide that independent evidence. The use of HTA as a means of supporting health policy and reimbursement decisions is becoming increasingly common internationally.</p> <ul style="list-style-type: none"> • Ireland made vaccine procurement decisions during a period when there was considerable uncertainty regarding which candidate vaccines would receive market authorisation and whether all vaccines would confer similar levels of protection. Given the considerable impact that Covid was having at that time on health, society and the economy, it was therefore considered prudent that a diversified vaccine portfolio was secured and be available to vaccinate the population. All Covid vaccine procurement decisions were made with full Government approval, and with full regard to balancing the risks/costs against the considerable upside benefits a successful vaccination programme would have on public health, society, and the economy. Ireland has had among the most successful vaccination programmes in the world and more than 11 million doses have been administered since the programme commenced in December 2020. The success of the programme has been a key enabler in the substantial resumption of economic life, enabling the unwinding of stringent public health measures and the cessation of Covid income support schemes. • There remains considerable uncertainty regarding the future trajectory of the disease and the level of vaccination required. The vaccination programme continues to be predicated on independent clinical advice provided by the National Immunisation Advisory Committee (NIAC). The NIAC continues to advise that the programme retains the capability to vaccinate the entire population at short notice should this be deemed required. The vaccination programme has begun to transition towards a more sustainable model which will see general practice/pharmacy replace vaccination centres as the primary vaccination channels. This approach will reduce certain fixed expenditure and make the programme more cost effective. It will not be possible to make further significant cost reductions until the epidemiological situation and associated clinical advice has stabilised.
Malta	<ul style="list-style-type: none"> • There is no research on the cost-effectiveness of NPIs or vaccination in Malta. • In terms of the impact of other studies on decision makers, these are not very large. The main parameters used as a basis for decision-making are the hospitalisations of Covid-19 positive patients. The target is still to avoid a burden for the hospital as much as possible. That is the basis for the decisions. • The 60+ booster campaign is still ongoing. There may be a joint Covid-19 / Influenza campaign in the autumn.
Norway	<ul style="list-style-type: none"> • In Norway, there were two Corona Commissions that assessed the overall impact of the pandemic, including the cost-effectiveness of vaccination and NPIs. So there are no studies, but extensive assessments. • During the pandemic, there was also a committee that looked at the social impact. We tried to assess the impact of the geographical distribution of vaccines and set up a study centre for WHO on the impact of NPIs, mainly on impact but not on cost-effectiveness.



	<ul style="list-style-type: none"> • Vaccination status: From 1 September, there will be a booster vaccination for the age group 65-75. Also specific risk groups are included into the 4th dose. The economy will bear future vaccinations, but it is still under discussion what the real benefit is for the lower age groups.
<p>Poland</p>	<p>Guided by the concern for the public health of the Polish society, including the maintenance and strengthening of public trust in preventive vaccinations, preventive vaccinations are undoubtedly one of the most effective and efficient preventive measures, and the strongest weapon in preventing and combating infectious diseases and infections and preventing complications after passing through infectious diseases.</p> <p>Undertaking activities to promote this form of prevention by drawing attention to its importance in the protection of public health is important due to the fact that the knowledge about the occurrence of complications related to the disease of infectious diseases and the accompanying social awareness of the possibility of preventing infectious diseases through the use of vaccines is a crucial health issue.</p> <p>In Poland, vaccinations against Covid-19 are voluntary and available to the entire society aged 5+ (details on how to implement vaccination schedules are available publicly in the Announcements of the Minister of Health for both medical staff and patients).</p> <p>Vaccinations against COVID-19 are carried out on the basis of current official recommendations, which may be updated together with the decision of the European Medicines Agency regarding the dosing schedules for the preparations used in the implementation of vaccination.</p> <p>From April 20th 2022 the second booster dose of the COVID-19 vaccination is vaccinated in people aged 80+ (who have received the full primary vaccination schedule and the first booster dose with COVID-19 mRNA preparation).</p> <p>At the same time, patients with impaired immunity who take the additional dose, receive a booster dose of the COVID-19 vaccination 5 months after the additional dose. Taking into account the recommendations of the Team for Preventive Vaccinations and the temporary guidelines of the Center for Disease Control and Prevention (as of March 31, 2022), people vaccinated before hematopoietic cells transplantation (HCT) or CAR-T therapy are subject to a repeated schedule of vaccination against COVID-19 after ≥ 3 months (12 weeks) from the indicated procedures or therapies.</p> <p>From August 17, 2022, the vaccination process began with a second booster dose for employees working in health care facilities, including pharmacies and pharmacy outlets, and for medical students who had received the full recommended primary vaccination schedule and a booster dose of COVID-19 vaccines.</p> <p>Many scientific studies confirm that vaccines are the most cost-effective form of therapy. Cost-effectiveness analysis is used in health technology assessment and involves identifying, measuring, and comparing the costs and health outcomes of two or more medical interventions.</p> <p>The Transparency Board of the Agency for Health Technology Assessment and Tariffs (AOTMiT) assesses the proposed national applications. The conclusions apply to both preventive programs and non-pharmacological interventions, including those based on i.a. information and education activities, training for medical personnel involved in a given intervention in a given area.</p> <p>e.g. Lyme disease prevention program https://profibaza.pzh.gov.pl/sites/default/files/pliki/Archiwum/AOTMiT/Rekomendacje/2_2020.pdf</p> <p>Detailed information on the Recommendations to Health Policy Programs from the last three years and the list of positive Opinions of the President of AOTMiT on health policy programs in 2010-2021 are available at the following link: https://profibaza.pzh.gov.pl/AOTMiT</p> <p>This link includes a list of Local Government Preventive Health Programs: http://wwwold.aotm.gov.pl/index.php?id=209</p> <p>A few medical / preventive interventions carried out in the country are available from publicly available sources of information.</p> <ol style="list-style-type: none"> 1) Vaccinations against pneumococci. The experience of vaccinating both children and adults against pneumococci in national programs of local government units shows that the number of hospitalizations for pneumonia is drastically decreasing. A few years ago, it was clearly demonstrated by the preventive programs of the Kielce local government. 2) Vaccine against HPV. HPV vaccination - prevents the consequences of the infection, i.e. neoplasms of oncogenic and non-oncogenic types, which significantly reduces the incidence and costs of anti-cancer therapies. The National Oncology Strategy for 2020-2030 states that HPV vaccinations will be reimbursed for girls in adolescence from 2021, and from 2026 they will also be reimbursed for boys in adolescence 3) Influenza vaccination – this study compares the unit cost of a vaccine with the costs incurred by the healthcare system, indicating the cost-effectiveness of vaccines. https://bipold.aotm.gov.pl/assets/files/opz/2014/OP-167-2014.pdf 4) Vaccinations against COVID-19 - the results of the "Analysis of the risk of death due to all causes and due to COVID-19 of vaccinated and unvaccinated people against COVID-19" (authors: dr n. przyr. Bogdan Wojtyniak, prof. NIZP PZH-PIB, dr n. med. Daniel Rabczenko, dr hab. n. o zdr. Grzegorz Juszczuk) indicate that the risk of deaths due to COVID-19 in unvaccinated people is much higher to those vaccinated against COVID-19, which justifies the decision about universal access to vaccination.



	The issue of cost effectiveness of vaccinations and NPIs is undertaken regularly on many conferences and seminars regarding the healthcare sector.
Portugal	There are no studies in terms of cost-effectiveness in Portugal.
Serbia	<ul style="list-style-type: none"> • In this moment, there are no planned studies related to the cost-effectiveness of vaccination and other non-pharmaceutical interventions, nor, as far as I know, have these data influenced decision-making. • As for the last question, given the current stock of vaccines at the national level, vaccines will still be available to the entire population, but if there is a limited availability of vaccines, e.g. vaccines adapted to new variants, the introduction of priority groups will certainly be considered in accordance with the recommendations of the Expert Committee on Immunization (NITAG).
Slovakia	<ul style="list-style-type: none"> • Not in sense of conventional cost-effectiveness analysis, the Ministry of Finance prepared flash comparisons of certain interventions vs. vaccination, just for Top level. At the same time we compared the cost of treatment per COVID patient vs. Vaccination costs. In the course of 2021 the outcome for almost all age groups the vaccination returned cost-effectivity, with financial incentives included. • Not in the beginning of pandemic, but later it became more frequent for politicians to compare costs vs. benefits. It was the case of mass testing, which was not so obvious in other countries. • The sustainability is irrelevant in Slovakia, as the estimated interest is far below the contracted volume of vaccines. We already have an official opinion from the Public Health Authority that a seasonal vaccination is recommended to immunocompromised groups, to healthcare workers, employees and residents of senior facilities, and population of 55+.
Slovenia	<ul style="list-style-type: none"> • There are no cost-effectiveness studies in Slovenia. • Studies from other countries have not influenced decision-makers • Vaccinating the entire population is seen as economically sustainable. The major challenge is that a large proportion of the population is unwilling to be vaccinated. Priority groups are defined based on the vaccination strategy, such as the elderly or vulnerable people.
Spain	<ul style="list-style-type: none"> • Regarding COVID-19, currently in Spain there are not published any research about cost-effectiveness of vaccines but there have been published for other diseases like Human papillomavirus (HPV) or Herpes Zoster: <ul style="list-style-type: none"> - The Spanish Network of Agencies for Assessing National Health System Technologies and Performance has published some documents with economic assessment of certain vaccines and vaccination strategies (i.e. Human papillomavirus (HPV)): https://redets.sanidad.gob.es/en/ - The Ministry of Health published in March 2021 recommendations for Herpes Zoster vaccination including a section of economical assessment with different studies carried out in Spain: https://www.sanidad.gob.es/profesionales/saludPublica/prevPromocion/vacunaciones/programasDeVacunacion/docs/HerpesZoster_RecomendacionesVacunacion.pdf Also there have been published different studies in terms of effectiveness of COVID-19 vaccines carried out by two members of the PHIRI ISCIII team: <ul style="list-style-type: none"> - Effectiveness of mRNA vaccine boosters against infection with the SARS-CoV-2 omicron (B.1.1.529) variant in Spain: A nationwide cohort study (Monge, Rojas-Benedicto, Olmedo, Mazagatos, et al., 2022). It showed that the administration of booster doses of the messenger RNA (mRNA) vaccine was associated with a 50% decrease in the risk of SARS-CoV-2 infection during the Omicron period in Spain. - Effectiveness of a Second Dose of an mRNA Vaccine Against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Omicron Infection in Individuals Previously Infected by Other Variants (Monge, Rojas-Benedicto, Olmedo, Martín-Merino, et al., 2022). It analysed the situation of people who had been vaccinated with only one dose because they had been previously infected before vaccination, during the same time period and using the same criteria as the previous paper. In this case, it was found that administering a second dose prevented 62% of omicron infections. - COVID-19 vaccine effectiveness against hospitalization due to SARS-CoV-2: A test-negative design study based on Severe Acute Respiratory Infection (SARI) sentinel surveillance in Spain (Mazagatos et al., 2022). This study presents COVID-19 vaccine effectiveness (VE) estimates in population aged 20 and older, between weeks 53/2020 and 39/2021, using a test-negative design and severe acute respiratory infection (SARI) data obtained from the SiVIRA sentinel hospital surveillance network, recently implemented in Spain. With an overall 89% VE against COVID-19 hospitalization, results show high effectiveness of mRNA vaccines against severe COVID-19 and waning of protection with time since vaccination in those aged 80 or older. No substantial differences were observed between SARS-CoV-2 variants (Alpha vs Delta).



The working group of COVID-19 vaccination effectiveness of the Ministry of Health have published different reports (last in May 2022): https://www.sanidad.gob.es/profesionales/saludPublica/prevPromocion/vacunaciones/covid19/docs/Efectividad_VacunacionCOVID-19_Espana_EstScreening_5Informe.pdf

In general terms, the website of the Ministry of Health has a section focused on 'COVID-19 vaccination'.

<https://www.sanidad.gob.es/profesionales/saludPublica/prevPromocion/vacunaciones/covid19/vacunasCovid19.htm>

In the Website of the Carlos III Health Institute there is also a section on COVID-19 vaccination, which includes follow up reports on effectiveness and impact of the different COVID-19 vaccines, as well as related scientific publications. Available in

<https://www.isciii.es/QueHacemos/Servicios/VigilanciaSaludPublicaRENAVE/EnfermedadesTransmisibles/Paginas/VacunacionCOVID-19.aspx>

Regarding NPIs, two members of the PHIRI ISCIII team have published the article Assessing the effect of non-pharmaceutical interventions on COVID-19 transmission in Spain, 30 August 2020 to 31 January 2021 (García-García et al., 2022) but it doesn't include cost-effectiveness information. It measured the impact of NPIs on COVID-19 transmission in several different geographical regions in Spain from 30 August 2020 to 31 January 2021. NPIs implemented during the second wave of COVID-19 in Spain had a significant impact in the spread of the disease, with some measures being more effective than others, including limited gatherings, mandatory closing times for nonessential businesses, and restricted outdoors seating capacity.

- At this moment, there is no official information already published about this topic. Previous to COVID-19 pandemic, one study (Soler Soneira et al., 2020) was published in 2020 for describing the cost of vaccination through-out life in Spain, both in healthy and risk groups persons, following the national immunization programme throughout life agreed for 2019. The expected cost to immunize a healthy person is 726.06 euros for a healthy woman and 625.89 euros for a healthy man, ranging from 982.99 to 1,815 euros per person in risk groups.

https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1135-57272020000100064

References

- Monge, S., Rojas-Benedicto, A., Olmedo, C., Mazagatos, C., José Sierra, M., Limia, A., Martín-Merino, E., Larrauri, A., Hernán, M. A., Moreno, D., Méndez Díaz, M., Huerta González, I., Galmés Truyols, A., Barreno Estévez, A., García Velasco, V., Rodríguez Recio, M. J., Sacristán, J., Martínez Marcos, M., Pastor Villalba, E., ... Cívicos Villa, N. (2022). Effectiveness of mRNA vaccine boosters against infection with the SARS-CoV-2 omicron (B.1.1.529) variant in Spain: A nationwide cohort study. *The Lancet Infectious Diseases*, S1473309922002924. [https://doi.org/10.1016/S1473-3099\(22\)00292-4](https://doi.org/10.1016/S1473-3099(22)00292-4)
- Monge, S., Rojas-Benedicto, A., Olmedo, C., Martín-Merino, E., Mazagatos, C., Limia, A., Sierra, M. J., Larrauri, A., Hernán, M. A., IBERCovid, Moreno, D., Díaz, M. M., González, I. H., Truyols, A. G., Estévez, A. B., Velasco, V. G., Recio, M. J. R., Sacristán, J., Marcos, M. M., ... Villa, N. C. (2022). Effectiveness of a Second Dose of an mRNA Vaccine Against Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Omicron Infection in Individuals Previously Infected by Other Variants. *Clinical Infectious Diseases*, ciac429. <https://doi.org/10.1093/cid/ciac429>
- Mazagatos, C., Delgado-Sanz, C., Monge, S., Pozo, F., Oliva, J., Sandonis, V., Gandarillas, A., Quiñones-Rubio, C., Ruiz-Sopeña, C., Gallardo-García, V., Basile, L., Barranco-Boada, M. I., Hidalgo-Pardo, O., Vazquez-Cancela, O., García-Vázquez, M., Fernández-Sierra, A., Milagro-Beamonte, A., Ordobás, M., Martínez-Ochoa, E., ... The SARI surveillance VE group in Spain. (2022). COVID-19 vaccine effectiveness against hospitalization due to SARS-CoV-2: A test-negative design study based on Severe Acute Respiratory Infection (SARI) sentinel surveillance in Spain. *Influenza and Other Respiratory Viruses*, irv.13026. <https://doi.org/10.1111/irv.13026>
- García-García, D., Herranz-Hernández, R., Rojas-Benedicto, A., León-Gómez, I., Larrauri, A., Peñuelas, M., Guerrero-Vadillo, M., Ramis, R., & Gómez-Barroso, D. (2022). Assessing the effect of non-pharmaceutical interventions on COVID-19 transmission in Spain, 30 August 2020 to 31 January 2021. *Eurosurveillance*, 27(19). <https://doi.org/10.2807/1560-7917.ES.2022.27.19.2100869>
- Soler Soneira, M.; Olmedo Lucerón, C., Sánchez-Cambronero Cejudo, L., Cantero Gudino, E., Limia Sánchez, A. (2020). El coste de vacunar a lo largo de toda la vida en España. *Rev Esp Salud Pública* 94: 11 de febrero e202002005

https://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S1135-57272020000100064

