Change in the level of vaccine protection over time in COVID-19 vaccinated individuals

Running title: Vaccine effectiveness over time in vaccinated individuals

A rapid review

Date of Literature Search: 10th September 2021.
Date of Submission: Version 2, 8th October 2021 (Version 1 - 22nd September 2021)

Prepared By:
Simon L. Bacon; Paula A B Ribeiro; Jovana Stojanovic; Keven Joyal-Desmarais; Ariany Marques Vieira; Doro Yip; *on behalf of the META Group.*

Contact:
Simon L. Bacon
Montreal Behavioural Medicine Centre
CIUSSS du Nord-De-L'île-De-Montréal
5400, boul Gouin O,
Montreal, Québec
H4J 1C5, Canada

Email: simon.bacon@concordia.ca

Suggested citation: *Bacon SL, Ribero PAB, Stojanovic J, Joyal-Desmarais K, Vieira AM, Yip D. Change in the level of vaccine protection over time in COVID-19 vaccinated individuals: A rapid review. Submitted to Public Health Agency of Canada in September, 2021.*

Land Acknowledgement(s)

The Montreal Behavioural Medicine Centre, Concordia University, UQAM, and the CIUSSS-NIM are located on unceded Indigenous lands. The Kanien'kehá:ka Nation is recognized as the custodians of the lands and waters on which these institutions stand today. Tiohtiá:ke commonly known as Montreal is historically known as a gathering place for many First Nations. Today, it is home to a diverse population of Indigenous and other peoples. We respect the continued connections with the past, present, and future in our ongoing relationships with Indigenous and other peoples within the Montreal community.

SPOR Evidence Alliance operates from the St. Michael's Hospital, Unity Health Toronto which is located on the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island.

COVID-END is housed within McMaster University which is located on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the "Dish With One Spoon" wampum, an agreement to peaceably share and care for the resources around the Great Lakes.

We are grateful to have the opportunity to work on these lands.

Funding Acknowledgement(s)

The SPOR Evidence Alliance (SPOR EA) is supported by the Canadian Institutes of Health Research (CIHR) under the Strategy for Patient-Oriented Research (SPOR) initiative.

COVID-19 Evidence Network to support Decision-making (COVID-END) is supported by the Canadian Institutes of Health Research (CIHR) through the Canadian 2019 Novel Coronavirus (COVID-19) Rapid Research Funding opportunity.

The members of the Montreal Behavioural Medicine Centre are supported by a variety of career and scholarship awards. Dr. Bacon is supported by the CIHR-SPOR initiative through the Mentoring Chair program (SMC-151518) and by the Fonds de recherche du Québec: Santé (FRQS) through the Chaire de recherche double en Intelligence Artificielle / Santé Numérique ET sciences de la vie program (309811). Dr. Stojanovic is supported by CIHR (MFE-175635) and FRQS postdoctoral fellowships. Ms. Vieira is supported by a FRQS PhD scholarship.

Project Contributors

Simon L Bacon, PhD, CIHR-SPOR Chair and Professor Department of Health, Kinesiology, and Applied Physiology, Concordia University, Montreal, Canada; META Group, Montreal Behavioural Medicine Centre, CIUSSS du Nord-de-l'Île-de-Montréal, Montreal, Canada. Research leader, project scientific coordination, design and planning, screening, data extraction, report writing and results translation/dissemination.

Paula A B Ribeiro, PhD, Scientific Coordinator / Research Associate - META Group, Montreal Behavioural Medicine Centre, CIUSSS du Nord-de-l'Île-de-Montréal, Montreal, Canada. Project scientific coordination, design and planning, electronic search, screening, data extraction, report writing and results translation/dissemination.

Jovana Stojanovic, PhD Postdoctoral fellow, Department of Health, Kinesiology, and Applied Physiology, Concordia University, Montreal, Canada; META Group, Montreal Behavioural Medicine Centre, CIUSSS du Nord-de-l'Île-de-Montréal, Montreal, Canada. Content expert with background in epidemiology, responsible for design and planning, electronic search, data extraction, report writing and results translation/dissemination.

Keven Joyal-Desmarais, PhD, Postdoctoral fellow, Department of Health, Kinesiology, and Applied Physiology, Concordia University, Montreal, Canada; META Group, Montreal Behavioural Medicine Centre, CIUSSS du Nord-de-l'Île-de-Montréal, Montreal, Canada. Design and planning, screening, report writing, results translation/dissemination and translation into French.

Ariany M Vieira, PhD Student, Department of Health, Kinesiology, and Applied Physiology, Concordia University, Montreal, Canada; META Group, Montreal Behavioural Medicine Centre, CIUSSS du Nord-de-l'Île-de-Montréal, Montreal, Canada. Design and planning, screening, data extraction and results translation/dissemination.

Doro Yip, Research Assistant, META Group, Montreal Behavioural Medicine Centre, CIUSSS du Nord-de-l'Île-de-Montréal, Montreal, Canada. Design and planning, administrative aspects of the project, screening, data extraction, report writing and results translation/dissemination. Coordinating the two patient partners' involvement.

Cynthia Lisée, patient/public partner. Reviewing data search approach, outcome interpretation, and results translation/dissemination.

Emilie Rufray, patient/public partner. Contributing to outcome interpretation and results translation/dissemination.

Johanne O'Malley, communications designer, external partner of Montreal Behavioural Medicine Centre, and patient/public partner. Results translation/dissemination through contributing to a plain language summary and designing an infographic.

Geneviève Szczepanik, Project Coordinator at Montreal Behavioural Medicine Centre. Helped translate final products into French.

Third-Party Materials

If you wish to reuse non-textual material from this report that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is required for such use and to obtain necessary permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned material rests solely with the user.

General Disclaimer

This report was prepared by the Montreal Behavioural Medicine Centre's META Group, on behalf of the SPOR Evidence Alliance and COVID-END. It was developed through the analysis, interpretation and synthesis of scientific research and/or health technology assessments published in peer-reviewed journals, institutional websites and other distribution channels. It also incorporates selected information provided by experts and patient/citizen partners with lived experience on the subject matter. This document may not fully reflect all the scientific evidence available at the time this report was prepared. Other relevant scientific findings may have been reported since completion of this synthesis report.

SPOR Evidence Alliance, COVID-END and the project team make no warranty, express or implied, nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, data, product, or process disclosed in this report. Conclusions drawn from, or actions undertaken on the basis of, information included in this report are the sole responsibility of the user.

Table of Contents

Abbreviations and Definitions

Abbreviations

CI	Confidence Interval
HCW	Healthcare workers
IQR	Interquartile Range
LTC	Long-term care
RCT	Randomized controlled trial
UK	United Kingdom
USA	United States of America
VE	Vaccine effectiveness
VOC	Variants of concern
VOC Alpha	Variant of concern B.1.1.7
VOC Delta	Variant of concern B.1.617.2
WHO	World Health Organization

Key Definitions

Fully vaccinated: A person who is at least 7 days post having received one of the following vaccine schedules:

- the full series of a COVID-19 vaccine authorized by Health Canada (i.e., AstraZeneca/COVISHIELD (AZD1222/ChAdOx1), Janssen (Johnson & Johnson: Ad26.COV2.S), Moderna (mRNA-1273), and Pfizer-BioNTech (BNT162b2)), or a combination of these vaccines
- the full series of the above vaccines plus an additional dose in immunocompromised individuals.(1)

Confirmed infection: A person with confirmation of infection with SARS-CoV-2 documented by:

- The detection of at least 1 specific gene target by a validated laboratory-based nucleic acid amplification test (NAAT) assay (e.g. real-time PCR or nucleic acid sequencing) performed at a community, hospital, or reference laboratory (the National Microbiology Laboratory or a provincial public health laboratory).(2)

Symptomatic illness: A person with confirmation of SARS-CoV-2 infection, presenting symptoms that vary in type, frequency, and severity. The most common symptoms include fever, chills, new or worsening cough, fatigue, headache, and gastrointestinal symptoms.(3)

Asymptomatic infection: A person with confirmation of SARS-CoV-2 infection but with no presentation of symptoms in the course of the disease.

Hospitalisations due to COVID-19: Inpatient admission to a hospital and/or ICU unit, associated with laboratory-confirmed SARS-CoV-2 infection.

Death due to COVID-19: Death resulting from a clinically compatible illness in a probable or confirmed COVID-19 case, with no presence of clear alternative causes unrelated to COVID-19 (e.g., trauma, poisoning, drug overdose).

Variants of concern (VOC): A SARS-CoV-2 variant is considered a VOC in Canada based on a set of criteria including increased transmissibility or detrimental change in COVID-19 epidemiology, increased virulence, decreased effectiveness of vaccines, and so on. As of August 05, 2021, Canada has designated the following SARS-CoV-2 variants as VOCs: Alpha (B.1.1.7), Beta (B.1.351, B.1.351.1.,

B.1.351.2, B.1.351.3, B.1.351.4), Gamma (P.1, P.1.1, P.1.2), and Delta (B.1.617.2, AY.1, AY.2, AY.3, AY.3.1).(4)

Vaccine effectiveness (VE): In the context of the current report, we have utilised the term vaccine effectiveness to cover all studies. However, we are aware that the studies that have been included range from efficacy through to effectiveness studies. We decided to use this terminology as it is consistent with how most evidence synthesis products describe these studies. To be consistent with this, in the French summary we have utilised the term efficacité, and it is noted that in French there is no distinction between the translations of efficacy and effectiveness.

EXECUTIVE SUMMARY

Background

To date in Canada, four vaccines have been approved to prevent coronavirus disease 2019 (COVID-19). While their short-term (<4 months) effectiveness in preventing COVID-19 infections in the general population has been shown to be strong, it is unclear if this level of effectiveness is maintained over longer periods of time (≥4 months). There is some early phase work which suggests that there may be a reduction in effectiveness post 4 months, referred to as waning effectiveness. This has implications for the continued usage of COVID-19 prevention measures, such as mask wearing, and some jurisdictions are considering the possibility and potential to distribute additional doses of the approved vaccines to negate any potential waning effectiveness.

This rapid review sought to identify, appraise, and summarise emerging research evidence (covering 1st January to 10th September 2021) to support evidence-informed decision making and answer the question: **How does the level of vaccine protection, including effectiveness against asymptomatic and symptomatic infection, and severe outcomes change over time in individuals who have received a complete primary COVID-19 vaccine series?**

Additional sub questions included: Do these outcomes vary by population sub-group, specifically in healthcare professionals or in individuals over 60 and over 80 years of age?; Do these outcomes vary by vaccine type/product?; and Do these outcomes vary by vaccine schedule (interval between doses or heterologous versus homologous schedules)?

Key points

- Based on data from four and three studies, respectively, for COVID-19 related hospitalisations and death, vaccine effectiveness for confirmed COVID-19 cases from 7-14 days to 4 and 6 months post full schedule seemed to be stable over time. These changes seemed to be consistent across those who were 60 or older and vaccines (BNT162b2, mRNA-1273, and ChAdOx1). Given the heterogeneity in the available data, it was not possible to provide specific point estimates for the magnitude of change.
- Based on the data from four studies, there would seem to be a decrease in vaccine effectiveness for confirmed COVID-19 cases from 7-14 days post full schedule to 4 and 6 months post full schedule. Given the heterogeneity in the available data it was not possible to provide specific point estimates for the magnitude of change. Generally, the periods of time that the studies were conducted overlapped with an increase in the prevalence of the Delta variant.
- These changes seemed to be consistent in those who were over 60 years old. Though the majority of data came from studies using the BNT162b2 vaccine, similar patterns were seen with the mRNA-1273 vaccine

Potential implications for health systems decision-making

Though the current review provides some initial evidence for a waning in vaccine effectiveness (VE) for COVID-19 confirmed cases it is unclear if this is a function of a degradation in the immunogenicity or a reflection of the increased prevalence of VOCs, which are known to have a lower VE than the original strain of the virus. This, coupled with the relatively stable VEs for COVID-related hospitalisations and deaths, does not suggest that there would be any benefit in providing additional doses of the currently formulated vaccines 4 to 6 months after completing a full vaccine schedule. However, this needs to be considered in the context of the limited number of studies available and a lack of randomised controlled trial evidence on the utility of providing additional doses. Given the overall decrease in VE for cases, there may be a need to maintain certain COVID-19 prevention policies, mask wearing and physical distancing, even in fully vaccinated individuals.

RÉSUMÉ

Contexte

À ce jour au Canada, quatre vaccins ont été approuvés pour prévenir la maladie à coronavirus 2019 (COVID-19). Bien que leur efficacité* à court terme (moins de 4 mois) dans la prévention des infections à la COVID-19 dans la population générale se soient avérées élevées, il n'est pas clair si ce niveau d'efficacité se maintient sur de plus longues périodes de temps (4 mois et plus). Certains travaux de phases préliminaires suggèrent qu'il pourrait y avoir une réduction de l'efficacité après 4 mois, ce que l'on appelle le déclin de l'efficacité. Cela a des implications pour l'utilisation continue des mesures de prévention de la COVID-19, telles que le port du masque, et certaines autorités sanitaires envisagent la possibilité et le potentiel de distribuer des doses supplémentaires des vaccins approuvés pour éliminer tout déclin de l'efficacité.

Cette revue rapide vise à identifier, évaluer et résumer les résultats de recherche émergents (1er janvier au 10 septembre 2021) pour soutenir la prise de décision fondée sur des preuves et répondre à la question : **comment le niveau de protection vaccinale, incluant l'efficacité contre les infections asymptomatiques et symptomatiques et contre les résultats sévères, change-t-il au fil du temps parmi les personnes qui ont reçu une série primaire complète de vaccins contre la COVID-19?**

D'autres sous-questions comprenaient : ces résultats varient-ils selon des sous-groupes populationnels, en particulier chez les professionnels de la santé ou chez les personnes de plus de 60 ans et de plus de 80 ans?; Ces résultats varient-ils selon le type/produit de vaccin?; et ces résultats varient-ils selon le calendrier vaccinal (intervalle entre les doses ou calendriers hétérologues contre homologues)?

Points importants

- Sur la base des données de quatre et trois études, respectivement, portant sur les hospitalisations et les décès en lien avec la COVID-19, il semble que l'efficacité du vaccin demeure stable dans le temps pour les cas confirmés de COVID-19 entre la période de 7 à 14 jours après le calendrier complet et 4 à 6 mois après le calendrier complet. Ces changements semblaient être similaires parmi les personnes de 60 ans et plus, et pour les vaccins utilisés (BNT162b2, mRNA-1273 et ChAdOx1). Étant donné l'hétérogénéité des données disponibles, il n'a pas été possible de fournir des estimations ponctuelles précises quant à l'ampleur du changement.
- Sur la base des données de quatre études, il semble qu'il y aurait une diminution de l'efficacité du vaccin pour les cas confirmés de COVID-19 entre la période de 7 à 14 jours après le calendrier complet et 4 à 6 mois après le calendrier complet. Étant donné l'hétérogénéité des données disponibles, il n'a pas été possible de fournir des estimations ponctuelles précises quant à l'ampleur du changement. En général, les études ont été menées à des moments qui ont coïncidé avec l'augmentation de la prévalence du variant Delta.
- Ces changements semblaient être similaires parmi les personnes de plus de 60 ans. Bien que la majorité des données provenaient d'études utilisant le vaccin BNT162b2, des tendances similaires ont été observées avec le vaccin ARNm-1273.

Implications potentielles pour la prise de décision au sein des systèmes de santé

Bien que la présente revue rapide fournisse des preuves initiales d'une diminution de l'efficacité des vaccins dans les cas confirmés de COVID-19, il n'est pas clair si cela est fonction d'une réduction de l'immunogénicité ou si c'est un reflet de la prévalence accrue des variants préoccupants, pour lesquels

les vaccins sont reconnus pour avoir une plus faible efficacité comparativement à la souche d'origine du virus. Cette observation, associée aux efficacités relativement stables en lien avec les hospitalisations et les décès liés à la COVID-19, ne suggère pas qu'il y aurait un quelconque avantage à fournir des doses supplémentaires des vaccins actuellement formulés 4 à 6 mois après avoir complété le calendrier vaccinal. Cependant, il est important de prendre en considération le nombre limité d'études disponibles et le manque de données issues d'essais contrôlés randomisés portant sur l'utilité de fournir des doses supplémentaires. Compte tenu du déclin global de l'efficacité vaccinale pour les cas, il peut être nécessaire de maintenir certaines mesures de prévention de la COVID-19, notamment le port du masque et la distanciation physique, même chez les personnes entièrement vaccinées.

Le terme *efficacité* est utilisé pour des raisons de simplicité et ne fait pas de distinction entre les termes anglais « effectiveness » et « efficacy ».

Introduction

Caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), coronavirus disease (COVID-19) has resulted in more than 220,000,000 confirmed cases worldwide as of September 2021.(5) At the time of writing, Health Canada has approved four vaccines to prevent COVID-19: AstraZeneca/COVISHIELD (AZD1222/ChAdOx1), Janssen (Johnson & Johnson: Ad26.COV2.S), Moderna (mRNA-1273), and Pfizer-BioNTech (BNT162b2). While many randomised controlled trials (RCTs) and real-world observational studies have shown their high effectiveness in preventing COVID-19 in the short-term (< 4 months) (6), less is known about their waning effects over time (≥ 4 months), especially with the emergence of new variants of concern (VOC) such as the B.1.1.7 (commonly known as Alpha) and B.1.617.2 (Delta) variants.(7) Our rapid review was requested to support Canadian public health decision makers' response to the COVID-19 pandemic. This rapid review seeks to summarize current evidence on **the level of vaccine protection over time in individuals who have received a complete primary COVID-19 vaccine series**.

Below are the main elements of our research question:

- **Population**: Individuals 12 years of age and older. Sub-groups: age specific (older adults 60+, older adults 80+) and healthcare workers.
- **Intervention:** At least four months of elapsed time from receipt of a full primary series with a Health-Canada authorized COVID-19 vaccine (AstraZeneca/COVISHIELD (AZD1222/ChAdOx1), Janssen (Johnson & Johnson: Ad26.COV2.S), Moderna (mRNA-1273), Pfizer-BioNTech (BNT162b2)), We also looked at the following sub-groups: within a homologous series (same product) and heterologous series (mixed products).
- **Control/Comparator**: Protection assessed at baseline (7-14 days after completing vaccine series).
- **Outcomes:** Effectiveness against any infection (symptomatic and asymptomatic) and severe illness (e.g., hospitalization and/or death due to COVID-19). We also explored studies that provided these data as a function of variants of concern (VOC).
- **Study design:** longitudinal studies that had prospective data capture.

Methods

This rapid review has been registered at the National Collaborating Centre for Methods and Tools, registration number 473 (https://www.nccmt.ca/covid-19/covid-19-evidence-reviews/473).

Eligibility Criteria

The following inclusion criteria were applied: 1) inclusion of individuals 12 years of age and older that received a full primary series of any vaccine recognized in Canada (AstraZeneca/COVISHIELD (AZD1222/ChAdOx1), Janssen (Johnson & Johnson: Ad26.COV2.S), Moderna (mRNA-1273), and Pfizer-BioNTech (BNT162b2)); 2) follow-up period of at least 4 months / 16 weeks / 119 days; 3) presentation of one of the following outcomes: effectiveness against any infection (symptomatic and asymptomatic) and severe illness (e.g., hospitalization and/or death due to COVID-19). Studies with prospective longitudinal data were included, such as randomized or non-randomised trials, quasi-randomized studies (e.g., allocated by site, county/city, date of birth design), and observational cohort studies; and 4) published in either English or French.
Exclusion criteria covered studies published in another language or which had a different design other than those included above (e.g. cross-sectional studies, case reports/series, reviews). Studies that included only immunogenicity outcomes (cellular or humoral immune response) were also excluded.

Literature Search

The search was performed on September 10th, 2021 including terms related to vaccination, such as type of vaccine (e.g., “RNA messenger”, “vector*”) and vaccine producer (e.g., “Pfizer”, “Moderna”, “Janssen”). The full search strategy is available in the **Supplementary Material**. The following sources were searched, with a publication limit from 1st January 2021 until 9th September 2021:

- National Institute of Health (NIH) iSearch COVID-19 portfolio, which includes PUBMED, ArXiv, BioRxiv, MedRvix, ChemRvix, SSRN, Preprints.org, Qeios, and Research Square;
- Embase;
- Hand search of the COVID-END Forum website, McMaster Health Forum website, and citations of systematic reviews on this topic.

Study Selection

Screening titles/abstracts and full-text articles was conducted upon completion of a piloting exercise, which included a random sample of 25 studies at each phase. Following the verification of the agreement between the reviewers, studies were screened by single reviewers. In cases of uncertainty, a second reviewer was consulted and disagreements were resolved by discussion. The entire process was performed through the screening management system Rayyan.

Data Extraction

Extracted data was recorded into Google Sheets extraction tables designed for this study. Two separate extraction sheets were designed covering the following information: 1) General overview of the study (e.g., year of publication, author, title, publication format, study design, study location, population description, intervention, vaccine dosing strategy, comparator); and 2) Study outcomes (e.g., sample size for the intervention and comparator groups, timing of the outcome assessments; point estimates of clinical outcomes of interest with accompanying 95% CI, and specific information on potential stratifiers).

To ensure reviewers had a common understanding of the extraction worksheet, preliminary meetings were carried out with the entire team to review the strategy and the extraction focus. A validation piloting exercise with two references was performed before moving on to final data extraction by a single reviewer. Discussions were performed in case of uncertainty and resolved with a senior member of the team (JS, PABR, SLB).

Risk of Bias Assessment

The adapted version of the ROBINS-I tool was used (**see Supplementary Material**). This tool assesses seven bias domains and judges each study against an ideal reference randomized controlled trial. The adaptation focused on study characteristics that may introduce bias specific to the vaccine literature (8), and was developed by a living evidence synthesis team focusing on the effectiveness of COVID-19 vaccines against VOCs.(9) The tool classifies Risk of Bias as Low, Moderate, Serious, Critical, or No Information. Single-reviewer procedure was adopted, with one senior member of the team performing Risk of Bias assessment (SLB), and a second reviewer verifying the assessment table (PABR).

Data Synthesis

Due to the limited number and nature of the studies, no formal data synthesis was conducted. This also meant that it wasn’t possible to provide specific recommendations, and as such, the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) was not conducted.

Results

Study Selection

The study identification and selection process is summarized in **Supplementary Material Figure 1**. The initial search yielded 11,444 retrieves and the hand search yielded another 105 retrieves, for a total of 11,549 studies included at the initial screening step. From these studies, a total of 349 articles were included for full text review. Overall, 12 studies were retained for inclusion in the final review, 5 of which were published, with 7 being preprints. Of the 12 studies, seven provided both usable baseline and ≥ 4 month data, with the other five providing ≥ 4 month but not baseline data.

Study Characteristics

Table 1 presents the descriptive characteristics of the included studies. Nine studies were cohorts and three were RCTs. Five studies (41.6%) reported data from the USA with no studies reported on Canadian data. The majority of studies reported data for the general population, with a number also including specific analyses in sub-groups.

Table 1. Descriptive characteristics of the included studies.

First author	Location	Study Design	Study Format	Population of interest	Sample size	Vaccine intervention	Comparator
Akhrass (10)	USA	Cohort	Pre-print	HCW	2,904	BNT162b2 or mRNA-1273 *	Unvaccinated
Andrews (11)	UK	Cohort	Pre-print	Persons at least 16 years of age	52,333,72	BNT162b2 or AZD1222 (ChAdOx1) *	Unvaccinated
Bruxvoort (12)	USA	Cohort	Pre-print	KPSC members	352,878 unvaccinated and 352,878 vaccinated	mRNA-1273	Unvaccinated
Chemaitelly *a* (13)	Qatar	Cohort	Pre-print	Residents of Qatar	173,496 PCR + and 1,422,333 PCR -	BNT162b2	Unvaccinated
Chemaitelly *b* (14)	Qatar	Cohort	Pre-print	Kidney transplant recipients	782	BNT162b2	Unvaccinated
Fowlkes (15)	USA	Cohort	Report	Frontline workers	3,975	BNT162b2, Ad26.CoV2.S and mRNA-1273	Unvaccinated
Goldberg (16)	Israel	Cohort	Pre-print	Israeli residents	4,785,245	BNT162b2	Unvaccinated
Madhi (17)	South Africa	RCT	Peer-review	Adults, no chronic disease, HIV-uninfected individuals	2,021	AZD1222 (ChAdOx1)	Unvaccinated (Placebo)
Sadoff (18)	Global	RCT	Peer-review	Adults aged ≥18 years	43,783	Ad26.CoV2.S	Unvaccinated (Placebo)
Tartof (19)	USA	Cohort	Pre-print	KPSC members	3,436,957	BNT162b2	Unvaccinated
Thomas (20)	Global	RCT	Peer-review	Persons at least 16 years of age	44,047	BNT162b2	Unvaccinated (Placebo)
Thompson (21)	USA	Cohort	Peer-review	Adults aged ≥50 years	41,552 hospitalisations + 21,522 ED visits from 187 hospitals	BNT162b2, Ad26.CoV2.S and mRNA-1273	Unvaccinated

Legend: USA: United States of America; UK: United Kingdom; HCW: healthcare workers; KPSC: Kaiser permanente Southern California
*Data are reported separately by the vaccine.

Summary of findings for confirmed COVID-19 cases

A total of four studies provided usable baseline and follow-up information with regards to confirmed COVID-19 case data (a combination of both symptomatic and asymptomatic cases). Three of these studies reported data for the BNT162b2 vaccine, one for mRNA-1273, and one that included combined data for BNT162b2 and mRNA-1273, i.e., all data of that study was related to the mRNA vaccines. Two studies provided specific data for VOCs. As can be seen in **Table 2**, there was a general decline in VE over time. However, it should be noted that there was a great deal of within and between study variability in the ≥ 4 month measures of VE meaning that it was impossible to extract a reliable point estimate. This trend seemed to be consistent for the general population, those over 60 years, and across vaccines and variants.

Summary of findings for COVID-19 hospitalisations

A total of four studies provided usable baseline and follow-up information with regards to COVID-19 hospitalisation data (including any COVID-19 related hospitalisation). Three of these studies reported data for the BNT162b2 vaccine, two for mRNA-1273, one for ChAdOx1, and one that included combined data for BNT162b2 and mRNA-1273, i.e., all data was related to the mRNA vaccines. One study provided specific data for the Delta variant. As can be seen in **Table 2**, unlike confirmed cases, VE was generally stable for hospitalisations, with a very small decline over time. Once again, there was a great deal of within and between study variability in the ≥ 4 month measures of VE meaning that it was impossible to extract a reliable point estimate. This trend seemed to be consistent for the general population, those over 65 years, and vaccines.

Summary of findings for COVID-19 related deaths

A total of three studies provided usable baseline and follow-up information with regards to COVID-19 related mortality data. Two of these studies reported data for the BNT162b2 vaccine, one for mRNA-1273, and one for ChAdOx1. One study provided specific data for the Delta variant. As can be seen in **Table 2**, VE was generally stable for COVID-19 related deaths, with a very small decline over time. Once again, there was a great deal of within and between study variability in the ≥ 4 month measures of VE meaning that it was impossible to extract a reliable point estimate. This trend seemed to be consistent for the general population, those over 65 years, and vaccines.

Summary of findings for symptomatic and asymptomatic cases, and severe COVID-19 illness

A total of four studies provided usable baseline and follow-up information with regards to symptomatic COVID-19 cases, one study provided data for asymptomatic cases, and two studies provided data for severe COVID-19 illness. Unsurprisingly, the symptomatic data followed the general patterns of the confirmed cases data and the data for asymptomatic cases and severe illness was too limited to provide any useful information. As such, we did not report specifically on these aspects.

Table 2. Visual summary of evidence for COVID-19 vaccines effectiveness.

Percentages indicate level of effectiveness from 0% (no effect) to 100% (full protection): ranges of estimated means are provided when ≥ 1 study is available; estimated mean value is provided for single studies

Colour indicates level of certainty based on the evidence

- High certainty evidence = pooling of moderate to high quality RCTs or pooling of observational studies with low risk of bias and with consistent findings
- Moderate certainty evidence = single RCT of moderate to high quality or ≥ one observational study with low to moderate risk of bias and with at least partially consistent findings
- Low certainty evidence = single RCT of low quality or single observational study of any quality or multiple low or moderate observational studies with inconsistent findings

Population (and vaccine)	7-21 days post full vaccine schedule (Baseline)	119-150 days post full vaccine schedule	154-175 days post full vaccine schedule
Confirmed Cases			
General (adults)			
BNT162b2	77 to 88%	52 to 61%	0 to 47%
mRNA-1273	85%		74%
Individuals 60+ yrs			
BNT162b2	66 to 80%	47 to 49%	0 to 43%
Delta variant			
BNT162b2	84 to 93%	13 to 53 %	0%
Hospitalisations			
General (adults*)			
BNT162b2	87%		88 to 91%
mRNA-1273	97%		96%
Individuals 60+ yrs			
BNT162b2	84%		83 to 85%
Delta variant			
BNT162b2	100%	93 to 94%	
ChAdOx1	94%	77 to 87%	
COVID-19 deaths			
General (adults)			

Population (and vaccine)	7-21 days post full vaccine schedule (Baseline)	119-150 days post full vaccine schedule	154-175 days post full vaccine schedule
BNT162b2	94%	80%	
mRNA-1273	100%		100%
Delta variant			
BNT162b2	98%	90%	
ChAdOx1	93%	79%	

* One study included individuals 50 years and older

Study specific results

Tables 3-6 provide a breakdown of the specific time points and VE (95% CIs) for each study for each outcome. Where possible, this data is provided for any relevant sub-groups.

Variations by vaccine schedule

No studies provided details of the interval between vaccine doses or compared heterologous to homologous schedules. As such, we weren't able to provide any information on the association between these factors and the VE outcomes.

Risk of bias assessment

The risk of bias data for each individual study is provided in the **Supplementary Material**. Overall, the risk of bias was low for the majority of items and moderate for a few. One study (10) had a critical concern for how it accounted for the calendar time within the analyses. However, as this study didn't provide a baseline value, it didn't end up contributing any usable data.

Strengths and Limitations

Key strengths of the present review include the broad search terms that were included during the initial screening phase, the rigorous methodologies that were employed throughout the review, and validation processes that were included to ensure consistency. In spite of these strengths, there were several limitations that need to be noted. As with any rapid review process, there is a slightly increased possibility that studies might be missed when compared to a full systematic review. However, this was potentially mitigated as we validated our study inclusions against two other evidence synthesis teams. Due to the turnaround time for the review, we were also limited in the scope of potential sub-groups that could be included and we were not able to extract any immunogenicity data. However, we were able to identify data for several key sub-groups within the extracted studies. We would also direct readers to one previous COVID-END report on vaccines and immunogenicity (22) and an ongoing COVID-END living review on vaccines and variants of concern.(9)

Conclusions

Overall, it would seem that the effectiveness of the vaccines for confirmed COVID-19 cases diminishes from 7-14 days post full vaccine schedule to 4-6 months post full vaccine schedule. However, it should be noted that the calendar time periods for most of the studies overlapped with the emergence of the more potent Delta variant, i.e., population had a low level of the Delta variant during the baseline period but a high level of the variant at follow-up. It is possible that the reported diminishing effectiveness may reflect the lower VE against the Delta variant rather than any reduction in the immunogenicity of the vaccines against the origin strain of the virus. Two studies provided specific VE data for confirmed Delta variant cases. Tartof et al, (19) saw an initial Delta variant case VE in a US sample of 93% (95%CIs = 85-97%) which reduced to 53% (95%CIs = 39-65%) by 4-5 months and Chemaitelly et al, (13) saw an initial Delta variant case VE of 84% (95%CIs = 74-91%) in Qatar, which reduced to 13% (95%CIs = 0-35%) by 4-5 months and then further reduce to 0% (95%CIs = 0-21%) by +6 months. In general, this pattern of reduced VE is consistent with other studies included in this synthesis that measured VE against any confirmed cases but didn't confirm the variant strain of the case. It should also be noted that, though there was limited available data, the pattern of change in VE for confirmed cases seemed to be consistent across vaccines and sub-groups.

Though there seemed to be a small reduction in VE over time for COVID-19 related hospitalisations and deaths, the pattern of change coupled with the variability of estimates both within and between studies makes it unclear if this is a significant change or not. Given that the vaccines were predominantly developed to reduce hospitalisations and death, the fact that VE seems to be stable, in contrast to confirmed cases, suggests that their VE for these outcomes may be consistent over the medium term (4-6 months). As with confirmed cases, the period of data capture coincides with a general increase in the prevalence of the Delta variant. One study provided Delta variant specific data in a British sample. Andrews et al, (11) saw a slight reduction in the initial hospitalisation from the Delta variant VE of 99.7% (95%CIs = 97.6-100%) to 94.4% (95%CIs = 93.4-95.2%) at 4 months and 92.7% (95%CIs = 90.3-94.6%) at 5 months for the BNT162b2 vaccine. In contrast, the same study saw the initial hospitalisation VE drop from 93.9% (95%CIs = 91.3-95.7%) to 86.8% (95%CIs = 85.1-88.4%) at 4 months and 77.0% (95%CIs = 70.3-82.3%) at 5 months for the ChAdOx1 vaccine. This suggests that the BNT162b2 vaccine may have better medium term VE for Delta variant related hospitalisations compared to the ChAdOx1 vaccine.

Community member perspectives

We were two patient partners to participate in the study, and we started by meeting Doro (research assistant) and Simon (principal investigator). Doro then took on the role of coordinator between us and the rest of the team and organizing the meetings and their reports. I liked the way the team integrated us, sharing with us all the necessary information. They were able to create a safe environment for us to participate despite the very tight deadlines for the study. Being with my "colleague" Cynthia also made me feel more comfortable. The discussions were very open, the team made it clear what was expected and their progress as they went, and we were able to share our observations easily with them.

~ Émilie Rufray

I'm pleased with the way the team integrated the citizen partners. We first met as a small team consisting of the research assistant, Doro, and the principal investigator, Simon. This setting allowed for a safe pace to get acquainted and clear off the expectations and the possible implications. In addition, it was easier for me to feel the presence of my "colleague" Emilie and to quickly form a sense of belonging to the team with her. Following that meeting, the team worked transparently with us, sharing their working documents, giving us regular updates and always offering to help us if we had any

questions. I really felt that I could share my concerns and understandings, with the confidence that the team would address them with kindness while rigorously addressing what could be addressed.

~ Cynthia Lisée

Constraints on Generality According to Population (23)

In this review, we wished to draw inferences about the effects of COVID-19 vaccination on humans aged 12 years and older. However, the selection of studies we uncovered to answer our research question was more limited in scope. For example, ten of the 12 studies included in this review relied on samples from predominantly wealthy nations: the United States, the United Kingdom, Qatar, and Israel—four countries that have further demarcated themselves globally by being at the forefront of early vaccine deployment efforts. There was some representation of participants from Latin America and South Africa, but these represented less than 1% of the total sample in the current review. Given differences in sociopolitical contexts across nations, along with differences in pandemic-related policies (e.g., mask-wearing policies, intervals between doses) and situations (e.g., prevalence of different VOCs), it is currently unclear whether our conclusions would generalize to a wider global context. For example, if our observation of decreasing VE against new infections can be attributable to the increasing prevalence of new variants (e.g., the Delta variant), then changes in VE could manifest differently in countries where such variants are more (where we might expect a higher decline in VE) vs. less prevalent (where we might expect a lower decline in VE).

*Constraints for specific populations of interest***.** In considering the generality of our inferences, it is also important to note that we predominantly focused on extracting the *average* effectiveness of the vaccines for each study. Although patterns were often consistent across studies, there could still be substantial heterogeneity *within* each study. With this in mind, during the early planning stages for this review, our team consulted with Canadian public health decision makers to identify key subpopulations of interest for whom: (a) there were reasons to suspect differences in vaccine effectiveness compared to the general population; and/or (b) there may be differential susceptibility to COVID-19 infections that warrant special attention. Initially, while screening articles for relevance, our team explored whether VE data could be isolated for the following subgroups of interest: (1) individuals aged 60 years and above; (2) individuals aged 80 years and above; (3) healthcare professionals; (4) immunocompromised individuals; (5) individuals with comorbid conditions; (6) pregnant women; (7) individuals residing in congregate living conditions; and (8) individuals residing in long-term care. Screening of articles suggested that data may only feasibly be extractable for the first three of these categories. Consequently, we focused our research question (and data extraction efforts) on these three groups. However, upon closer investigation during the data extraction stage, we were only able to consistently extract results for the first grouping; that is, for individuals aged 60 and above.

Overall, this experience suggests that studies should make efforts to provide more detailed findings broken down by populations that may be of specific interest to policy makers (e.g., this could be provided in online supplements). The eight categories noted above are example categories of interest, but are not exhaustive (e.g., breakdowns by other characteristics such as sex and race would also be desirable). However, we note that because we were conducting a rapid review, we did not make efforts to contact investigators to request additional data. Future synthesists may consequently wish to pursue this option.

Team positionality statement

We recognize that the positionality of our team (e.g., how our team members' backgrounds relate to society and to the current study topic) can influence our work and the conclusions we draw. In order to

explore the impact of our positionality, we engaged in an open-ended activity that encouraged each member of our team to reflect on ways in which their personal backgrounds and experiences (both within and outside our team) may have shaped the current review. In the text below, we summarize our reflection along four themes.

1. **How does our team's background influence our engagement with science?** Our team is composed of individuals with academic training in diverse fields that intersect with health research (e.g., from epidemiology, to physiology, microbiology, and psychology). Our training is predominantly informed by Western scientific paradigms, and this leads us to generally favour quantitative approaches to understanding scientific phenomena (e.g., prioritizing evidence from strong randomised control trials and meta-analyses). However, many members of our team also hold or intersect with non-traditional and underrepresented identities in research. For example, several team members come from middle-income countries, and many of us have lived experiences with themes such as immigration, poverty, uncommon health conditions, and being minorities. These experiences, along with training and work (e.g., advocacy) on themes tied to equity, diversity and inclusion, have led us to be sensitive to discrepancies in representation and in the impacts that research can have for members of different groups.

2. **How do our experiences impact our perspectives on COVID-19 vaccination?** Overall, before conducting this review, our team members generally held positive attitudes and beliefs towards the COVID-19 vaccines—a position informed by our past works and readings of the research—and many of us have been involved in works to directly and indirectly promote vaccination (e.g., the MBMC has been involved in creating research as well as public materials to understand and reduce vaccine hesitancy during the pandemic). That said, given our backgrounds, many of us also hold cautious views towards an uncritical implementation of health policies, with worries about how such acts can lead to detrimental effects for certain individuals, especially members of already underserved communities. However, we note that our team lacked direct representation from several key perspectives; for instance, that of policy-makers (who propose and enact policies tied to COVID-19 vaccines) and of frontline healthcare workers (directly involved in distributing COVID-19 vaccines), among others.

3. **What are factors that influence how we communicate our findings?** As noted above, our team holds predominantly favourable views towards COVID-19 vaccines. This, together with the team's education, will have shaped the writing of this report. For example, we may interpret VE data from an optimistic lens, but we also lean towards using cautious language to convey limitations in our certainty when making inferences. As our team holds values tied to making science accessible, we were aware that our report's academic tone could make it complex to read and sought alternate ways to make findings more accessible. Thus, we worked collaboratively (leveraging our team's diverse experiences and expertise creating knowledge translation materials) to develop a plain language summary and an infographic designed for public audiences. These were produced in English, and then translated to French. It should be noted that because the review was requested by the Public Health Agency of Canada, our team developed this project, and wrote our report, with a Canadian perspective in mind. However, given that this review may be of interest to a wider global audience, we have made sure to acknowledge ways in which our findings may or may not generalise.

4. **How did our team operate in the context of this rapid review?** When organising our team for this review, we sought to promote a collaborative environment to improve the rigour of the research while also allowing growth and learning within the team (which included several trainees, early career researchers, and community investigators). The varied levels of expertise allowed for richer perspectives, but also entailed challenges such as ensuring everyone felt they could meaningfully contribute to discussions. The work was also conducted within a narrow time period, which required us to streamline processes and create fewer opportunities for discussion and involvement than we would have hoped for; as a result, it was not possible to include all team members in each stage of the review. Time constraints also led us to simplify the scope of our review (e.g., extracting fewer elements than initially planned) and to delay certain procedures (e.g., the creation of a positionality statement) until after a preliminary version of the report had been produced. Despite these challenges, our reflection at the end of the review revealed that all team members felt the team had succeeded in creating an environment that allowed them to express their opinions openly and contribute to collective decisions throughout the review.

All team members completed an individual reflection on intersectionality, positionality, and their implications for our project. A full anonymized, randomized list of reflections is available in the **Supplementary Material**.

Potential implications for health systems decision-making

Though the current review provides some initial evidence for a waning in VE for COVID-19 confirmed cases, it is unclear if this is a function of a degradation in the immunogenicity or a reflection on the increased prevalence of VOCs (and specifically the Delta variant), which are known to have a lower VE than the original strain of the virus. This, coupled with the relatively stable VEs for COVID-related hospitalisations and deaths, does not suggest that there would be any benefit in providing additional doses of the currently formulated vaccines 4 to 6 months after completing a full vaccine schedule. However, this needs to be considered in the context of the limited number of studies available and a lack of randomised controlled trial evidence on the utility of providing additional doses. Furthermore, to reduce the transmission of the virus and limit increases in cases, there may be a need to maintain some COVID-19 preventions behaviours, e.g., mask wearing and physical distancing, in individuals who are fully vaccinated. Once again, this needs to be considered in the context of the limited number of studies available looking at multiple transmission prevention strategies and a lack of randomised controlled trial evidence on the utility of combinations of prevention measures.

Table 3. Vaccine effectiveness results for confirmed cases of COVID-19, according to the target population and vaccines. Time refers to the number of days (d), weeks (w), or months (m) since the completion of the full vaccine schedule.

				Baseline		Follow-up 1		Follow-up 2		Follow-up 3	
Author	**Vaccine**	**Inference population**	**VOC**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**
Studies with baseline data											
Chemaitelly a	BNT162b2	General	No	*0-4 w*	77.2 (76.4-78.0)	*15-19 w*	51.6 (47.7-55.3)	*20-24 w*	6.3 (0.0-13.5)	*≥25 w*	0.0 (0.0-0.0)
Tartof	BNT162b2	General (≥12)	No	*7-36 d*	88 (86-89)			*127-156 d*	61(58-64)	*≥157 d*	47 (43-51)
Bruxvoort	mRNA-1273	General (≥18)	No	*1 m*	85.3					*5 m*	74
Chemaitelly a	BNT162b2	General	Alpha	*0-4 w*	67.8 (57.1-76.1)	*15-19 w*	11.9 (0-59.1)	*20-24 w*	0 (0-48.9)	*≥25 w*	0 (0-57.3)
Chemaitelly a	BNT162b2	General	Beta	*0-4 w*	74.3 (68.5-79.2)	*15-19 w*	47.7 (7.5-71.2)	*20-24 w*	26.4 (0-65.9)	*≥25 w*	71.5 (0-97.1)
Chemaitelly a	BNT162b2	General	Delta	*0-4 w*	83.8 (73.6-90.5)	*15-19 w*	13 (0-34.8)	*20-24 w*	0 (0-1.3)	*≥25 w*	0 (0-21.3)
Tartof	BNT162b2	General (≥12)	Delta	*7-36 d*	93 (85-97)			*127-156 d*	53 (39-65)		
Tartof	BNT162b2	General (≥12)	Other	*7-36 d*	97 (95-99)			*127-156 d*	67 (45-80)		
Chemaitelly a	BNT162b2	Prior positive test	No	*0-4 w*	71.3 (70.1- 72.5)	*15-19 w*	28.5 (20.2-35.9)	*20-24 w*	0 (0-0)	*≥25 w*	0 (0-0.7)
Chemaitelly a	BNT162b2	≥60 y	No	*0-4 w*	66.3 (59.7 -71.8)	*15-19 w*	46.6 (23.1 - 63.2)	*20-24 w*	27.3 (0-55.3)	*≥25 w*	0 (0-17.4)
Tartof	BNT162b2	≥65 y	No	*7-36 d*	80 (73-85)			*127-156 d*	49 (41-57)	*≥157 d*	43 (30-54)

				Baseline		Follow-up 1		Follow-up 2		Follow-up 3	
Author	**Vaccine**	**Inference population**	**VOC**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**
Studies without baseline data											
Goldberg	BNT162b2	≥60	No			*19-24 w*	65 (57-71)	*21-26 w*	63 (57-67)	*23-28 w*	57 (52-62)
Fowlkes	Mixed	Frontline workers	No			*120-149 d*	81 (34-95)	*≥150 d*	73 (49-86)		
Chemaitelly b	Mixed	Kidney transplant patients	No			*≥120 d*	46 (0-73.7)				

Legend: d = days; w = weeks; m = months.

Table 4. Vaccine effectiveness results for symptomatic COVID-19 cases according to the target population and vaccines. Time refers to the number of days (d), weeks (w), or months (m) since the completion of the full vaccine schedule.

				Baseline		Follow-up 1		Follow-up 2		Follow-up 3	
Author	**Vaccine**	**Inference population**	**VOC**	**Time**	**VE (95% CIs)**	**Time**	**VE (95% CIs)**	***Time***	**VE (95% CIs)**	**Time**	**VE (95% CIs)**
Studies with baseline data											
Sadoff	Ad26.COV2.S	General	No	7 d	0	112 d	58.2	*119 d*	61.1		
Thomas	BNT162b2	General (≥12)	No	≥7 d	91.2 (88.9-93)	≥ 4 m	83.7 (74.7-89.9)				
Chemaitelly a	BNT162b2	General	No	0-4 w	82.1 (80.7-83.3)	15-19 w	39.6 (30-47.9)	*20-24 w*	0 (0-0)	≥25 w	0 (0-0)
Andrews	BNT162b2	General (≥16)	Delta	1 w	92.4 (92.1-92.7)	15-19 w	73.4 (72.9-73.9)	*≥20 w*	69.7 (68.7-70.5)		
Andrews	ChAdOx1	General (≥16≥)	Delta	1 w	62.7 (61.7-63.8)	15-19 w	52.6 (51.7-53.5)	*≥20 w*	47.3 (45-49.6)		
Andrews	BNT162b2	≥65+ (all)	Delta	1 w	65.4 (34.2-81.8)	15-19 w	62.1 (58.6-65.4)	*≥20 w*	55.3 (50.2-60)		
Andrews	ChAdOx1	≥65+ (all)	Delta	1 w	63.8 (48.2-74.8)	15-19 w	43.3 (38.1-48)	*≥20 w*	36.6 (28.7-43.7)		
Studies without baseline data											
Madhi	ChAdOx1	General	No							150 d	39.7
Akhrass	Mixed	HCWs	No			116 d	93.7 (90-98.2)				

Legend: d = days; w = weeks; m = months.

Table 5. Vaccine effectiveness results for hospitalizations, according to target population and vaccines. Time refers to the number of days (d), weeks (w), or months (m) since the completion of the full vaccine schedule.

				Baseline		Follow-up 1		Follow-up 2	
Author	**Inference population**	**Vaccine**	**VOC**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**
Studies with baseline data									
Thompson	≥50 yrs	BNT162b2	No	*14-27 d*	87 (80-91)	*≥112 d*	83 (64-92)		
Thompson	≥ 50 yrs	Mixed	No	*14-27 d*	88 (84-92)	*≥112 d*	86 (74-93)		
Thompson	≥ 50 yrs	mRNA-1273	No	*14-27 d*	90 (81-94)	*≥112 d*	95 (79-99)		
Tartof	≥65	BNT162b2	No	*7-36 d*	84 (74-90)	*127-156 d*	85 (77-90)	*≥157 d*	83 (69-90)
Andrews	≥65 (all)	BNT162b2	Delta	*1 w*	100	*15-19 w*	93 (90.9-94.6)	*≥20 w*	90.7 (86-93.8)
Andrews	≥65 (all)	ChAdOx1	Delta	*1 w*	86.2 (40.5-96.8)	*15-19 w*	85.4 (81.6-88.5)	*≥20 w*	76.3 (65.3-83.8)
Andrews	≥65 with CEV	BNT162b2	Delta	*1 w*	100	*15-19 w*	83.4 (70.6-90.7)	*≥20 w*	71.4 (40.9-86.1)
Tartof	General (≥12)	BNT162b2	No	*7-36 d*	87 (82-91)	*127-156 d*	91 (87-93)	*≥157 d*	88 (82-92)
Andrews	General (≥16)	BNT162b2	Delta	*1 w*	99.7 (97.6-100)	*15-19 w*	94.4 (93.4-95.2)	*≥20 w*	92.7 (90.3-94.6)
Andrews	General (≥16)	ChAdOx1	Delta	*1 w*	93.9 (91.3-95.7)	*15-19 w*	86.8 (85.1-88.4)	*≥20 w*	77 (70.3-82.3)
Bruxvoort	General (≥18)	mRNA-1273	No	*1 m*	97			*5 m*	95.9
Studies without baseline data									
Andrews	≥65 with CEV	ChAdOx1	Delta			*15-19 w*	75.1 (56.3 - 85.8)	*≥20 w*	59.4 (14.1-80.8)

Legend: d = days; w = weeks; m = months; CEV = clinically extreme vulnerability

Table 6. Vaccine effectiveness results for death cases, according to target population and vaccines. Time refers to the number of days (d), weeks (w), or months (m) since the completion of the full vaccine schedule.

				Baseline		Follow-up 1	
Author	**Inference population**	**Vaccine**	**VOC**	***Time***	**VE (95% CIs)**	***Time***	**VE (95% CIs)**
Studies with baseline data							
Andrews	≥65 (all)	BNT162b2	Delta	*2-9 w*	97 (91.2 - 99)	*≥20 w*	91 (85.3-94.5)
Andrews	≥65 (all)	ChAdOx1	Delta	*2-9 w*	92.8 (87.4 - 95.9)	*≥20 w*	79.1(51.6-91)
Andrews	General (≥16)	BNT162b2	Delta	*2-9 w*	98.2 (95.9-99.2)	*≥20 w*	90.4(85.1-93.8)
Andrews	General (≥16)	ChAdOx1	Delta	*2-9 w*	94.1 (91.8 - 95.8)	*≥20 w*	78.7(52.7-90.4)
Bruxvoort	General (≥18)	mRNA-1273	No	*1 m*	100	*5 m*	100
Chemaitelly a	General	BNT162b2	No	*0-4 w*	93.9 (84.5 - 98.1)	*15-19 w*	80.4(0-99.6)

Legend: d = days; w = weeks; m = months.

References

1. Ontario Ministry of Health. COVID-19 Fully Immunized and Previously Positive Individuals: Case, Contact and Outbreak Management Interim Guidance [Internet]. 2021 [cited 2021 Sep 21]. Available from: https://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/contact_mngmt/COVID-19_fully_vaccinated_interim_guidance.pdf

2. Public Health Agency of Canada. National case definition: Coronavirus disease (COVID-19) [Internet]. 2021 [cited 2021 Sep 21]. Available from: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/national-case-definition.html

3. Public Health Agency of Canada. COVID-19 signs, symptoms and severity of disease: A clinician guide [Internet]. 2020 [cited 2021 Sep 21]. Available from: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/signs-symptoms-severity.html

4. Canada PHA of. SARS-CoV-2 variants: National definitions, classifications and public health actions [Internet]. 2021 [cited 2021 Sep 21]. Available from: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/testing-diagnosing-case-reporting/sars-cov-2-variants-national-definitions-classifications-public-health-actions.html

5. Covidtracker - Covid-19 Coronavirus Tracker [Internet]. [cited 2021 Sep 20]. Available from: https://www.covidtracker.com/

6. Pormohammad A, Zarei M, Ghorbani S, Mohammadi M, Razizadeh MH, Turner DL, et al. Efficacy and Safety of COVID-19 Vaccines: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. Vaccines. 2021 May;9(5):467.

7. Gupta RK. Will SARS-CoV-2 variants of concern affect the promise of vaccines? Nat Rev Immunol. 2021 Jun;21(6):340–1.

8. World Health Organization. Evaluation of COVID-19 vaccine effectiveness [Internet]. 2021 Mar. Available from: https://www.who.int/publications/i/item/WHO-2019-nCoV-vaccine_effectiveness-measurement-2021.1

9. Iorio, A, Little, J, Linkings, L, Abdelkader, W, Bennet, D, Lavis, JN. COVID-19 living evidence synthesis #6 (version 6.19): What is the efficacy and effectiveness of available COVID-19 vaccines in general and specifically for variants of concern?

10. Akhrass FA, Reynolds N, Akhrass CA, Dawahare J, Raj R, Green G, et al. The association of vaccination and the incidence of new cases of COVID-19 among health care workers, December 16, 2020 through May 4, 2021 [Internet]. In Review; 2021 Jun [cited 2021 Sep 21]. Available from: https://www.researchsquare.com/article/rs-612401/v1

11. Andrews N, Tessier E, Stowe J, Gower C, Kirsebom F, Simmons R, et al. Vaccine effectiveness and duration of protection. 2021;25.

12. Bruxvoort K, Sy LS, Qian L, Ackerson BK, Luo Y, Lee GS, et al. Real-World Effectiveness of the mRNA-1273 Vaccine Against COVID-19: Interim Results from a Prospective Observational Cohort Study. SSRN Electron J [Internet]. 2021 [cited 2021 Sep 21]; Available from: https://www.ssrn.com/abstract=3916094

13. Chemaitelly H, Tang P, Hasan MR, AlMukdad S, Yassine HM, Benslimane FM, et al. Waning of BNT162b2 vaccine protection against SARS-CoV-2 infection in Qatar [Internet]. Epidemiology; 2021 Aug [cited 2021 Sep 21]. Available from: http://medrxiv.org/lookup/doi/10.1101/2021.08.25.21262584

14. Chemaitelly H, AlMukdad S, Joy JP, Ayoub HH, Yassine HM, Benslimane FM, et al. SARS-CoV-2 vaccine effectiveness in immunosuppressed kidney transplant recipients [Internet]. Epidemiology; 2021 Aug [cited 2021 Sep 21]. Available from: http://medrxiv.org/lookup/doi/10.1101/2021.08.07.21261578

15. Fowlkes A, Gaglani M, Groover K, Thiese MS, Tyner H, Ellingson K, et al. Effectiveness of COVID-19 Vaccines in Preventing SARS-CoV-2 Infection Among Frontline Workers Before and During B.1.617.2 (Delta) Variant Predominance — Eight U.S. Locations, December 2020–August 2021. MMWR Morb Mortal Wkly Rep. 2021 Aug 27;70(34):1167–9.

16. Goldberg Y, Mandel M, Bar-On YM, Bodenheimer O, Freedman L, Haas EJ, et al. Waning immunity of the BNT162b2 vaccine: A nationwide study from Israel [Internet]. Infectious Diseases (except HIV/AIDS); 2021 Aug [cited 2021 Sep 21]. Available from: http://medrxiv.org/lookup/doi/10.1101/2021.08.24.21262423

17. Madhi SA, Baillie V, Cutland CL, Voysey M, Koen AL, Fairlie L, et al. Efficacy of the ChAdOx1 nCoV-19 Covid-19 Vaccine against the B.1.351 Variant. N Engl J Med. 2021 May 20;384(20):1885–98.

18. Sadoff J, Gray G, Vandebosch A, Cárdenas V, Shukarev G, Grinsztejn B, et al. Safety and Efficacy of Single-Dose Ad26.COV2.S Vaccine against Covid-19. N Engl J Med. 2021 Jun 10;384(23):2187–201.

19. Tartof SY, Slezak JM, Fischer H, Hong V, Ackerson BK, Ranasinghe ON, et al. Six-month effectiveness of BNT162b2 mRNA COVID-19 vaccine in a large US integrated health system: a retrospective cohort study. 2021;24.

20. Thomas SJ, Moreira ED, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine through 6 Months. N Engl J Med. 2021 Sep 15;NEJMoa2110345.

21. Thompson MG, Stenehjem E, Grannis S, Ball SW, Naleway AL, Ong TC, et al. Effectiveness of Covid-19 Vaccines in Ambulatory and Inpatient Care Settings. N Engl J Med. 2021 Sep 8;NEJMoa2110362.

22. Rapid Review: What is the effectiveness, immunogenicity and safety of COVID-19 vaccines in persons who have had a prior, confirmed COVID-19 infection? [Internet]. 2021 Jun p. 47. Available from: https://www.nccmt.ca/covid-19/covid-19-rapid-evidence-service/36

23. Simons DJ, Shoda Y, Lindsay DS. Constraints on Generality (COG): A Proposed Addition to All Empirical Papers. Perspect Psychol Sci. 2017 Nov 1;12(6):1123–8.

Supplementary Material

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Bacon SL, Ribero PAB, Stojanovic J, Joyal-Desmarais K, Vieira AM, Yip D. Change in the level of vaccine protection over time in COVID-19 vaccinated individuals: A rapid review. Submitted to Public Health Agency of Canada in September, 2021.

Prepared By:
Simon L. Bacon; Paula A B Ribeiro; Jovana Stojanovic; Keven Joyal-Desmarais; Ariany Marques Vieira; Doro Yip; *on behalf of the META Group.*

Table of Contents

Table 1S - Search syntaxes performed on September 10th, 2021

NIH iSEARCH COVID	**Retrieves**
(mRNA OR messenger OR "RNA messenger" OR vector* OR Pfizer OR Moderna OR Janssen OR AstraZeneca OR Oxford OR BioNTech OR BNT162b2 OR mRNA-1273 OR AZD1222 OR ChAdOx1 OR Ad26.COV2.S OR JNJ-78436735 OR COVISHIELD) AND vaccin* **Limits:** Date: January 01, 2021 to September 10, 2021 **Fields:** Title and Abstract and Full-text	8,654
EMABASE Syntax	**Retrieves**
(mRNA or messenger or "RNA messenger" or vector* or Pfizer or Moderna or Janssen or AstraZeneca or Oxford or BioNTech).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] OR ("BNT162b2" or "mRNA-1273" or "AZD1222" or "ChAdOx1" or "Ad26.COV2.S" or "JNJ-78436735" or COVISHIELD).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] AND vaccination/ or Vaccin*.mp. or vaccine/ **limits: (yr="2021 -Current" and covid-19)**	2,790

FIGURE 1S - PRISMA flowchart for study selection

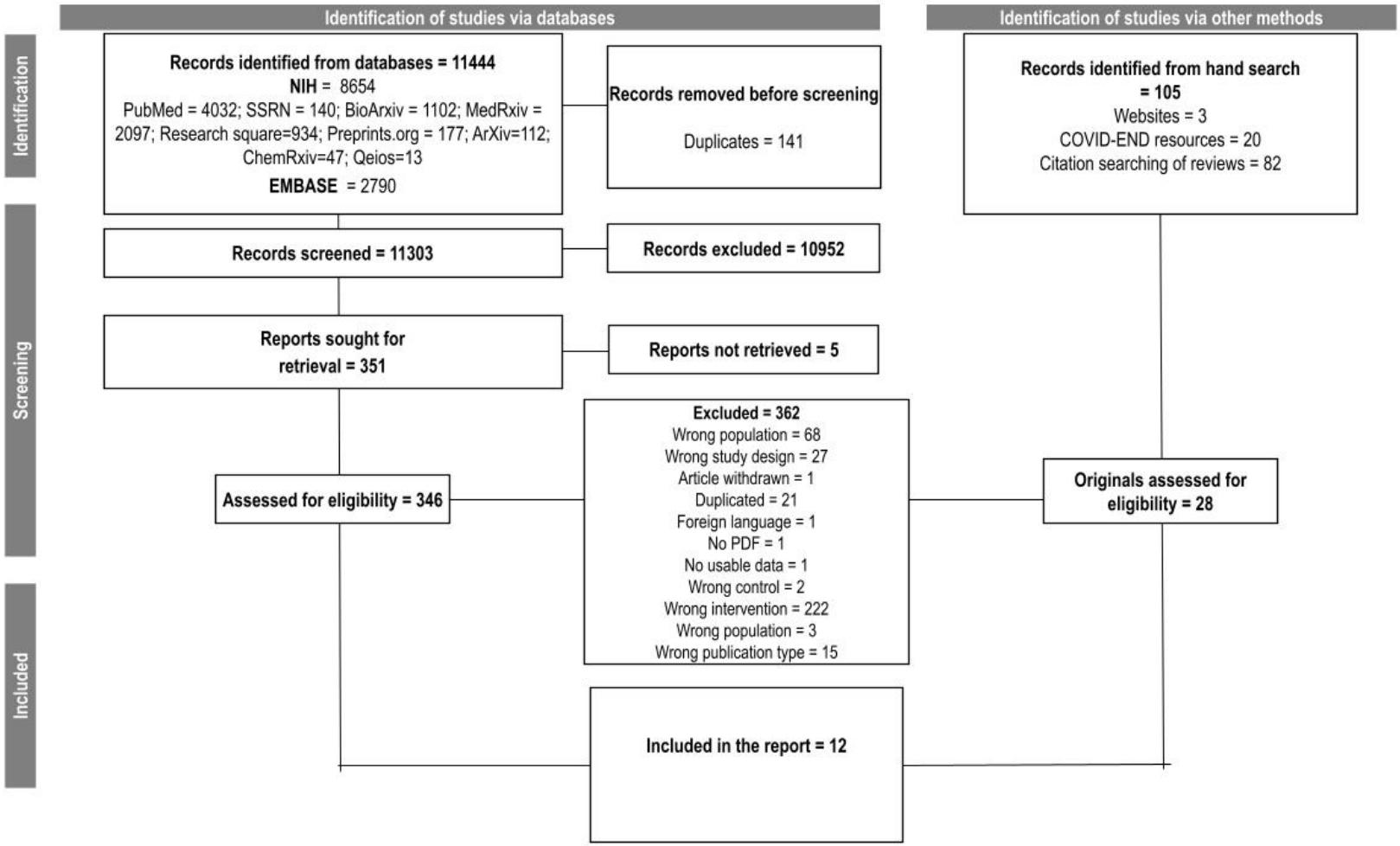
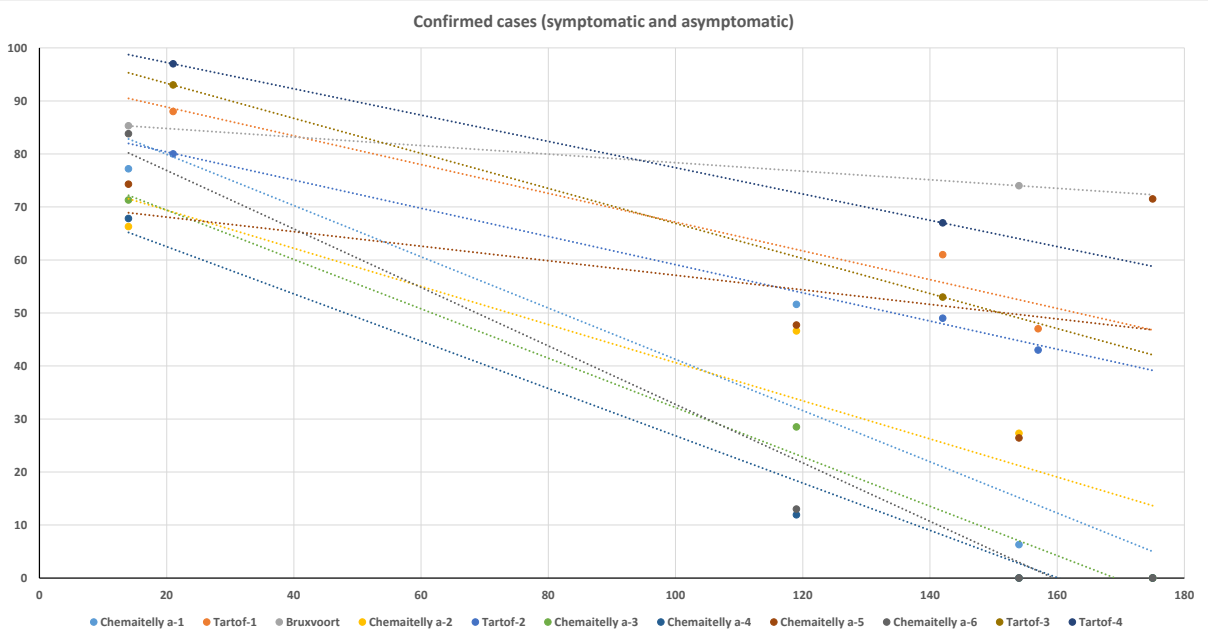


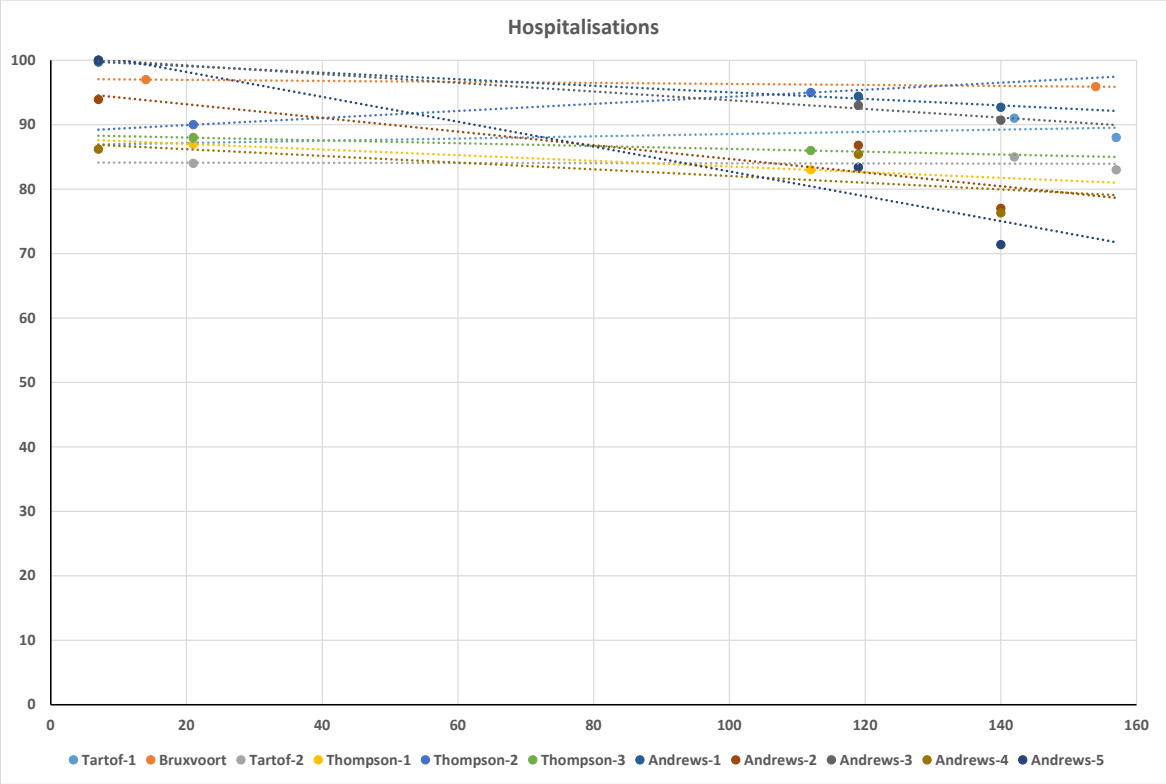
Figure 2S: Vaccine effectiveness for confirmed COVID-19 cases (combination of symptomatic and asymptomatic) in days since completion of a full vaccine schedule, with accompanying information on the vaccine, inference population, and variant of the included studies.



The lines indicate the trendline for each individual study (created using the trendline function in excel).

Author	Vaccine	Inference population	Variant
Chemaitelly a-1	BNT162b2	General (assume adult only)	No
Tartof-1	BNT162b2	General (≥12 yrs)	No
Bruxvoort	mRNA-1273	General (≥18 yrs)	No
Chemaitelly a-2	BNT162b2	≥60 yrs	No
Tartof-2	BNT162b2	≥65 yrs	No
Chemaitelly a-3	BNT162b2	Prior positive COVID-19 test	No
Chemaitelly a-4	BNT162b2	General (assume adult only)	Alpha
Chemaitelly a-5	BNT162b2	General (assume adult only)	Beta
Chemaitelly a-6	BNT162b2	General (assume adult only)	Delta
Tartof-3	BNT162b2	General (≥12 yrs)	Delta
Tartof-4	BNT162b2	General (≥12 yrs)	Others

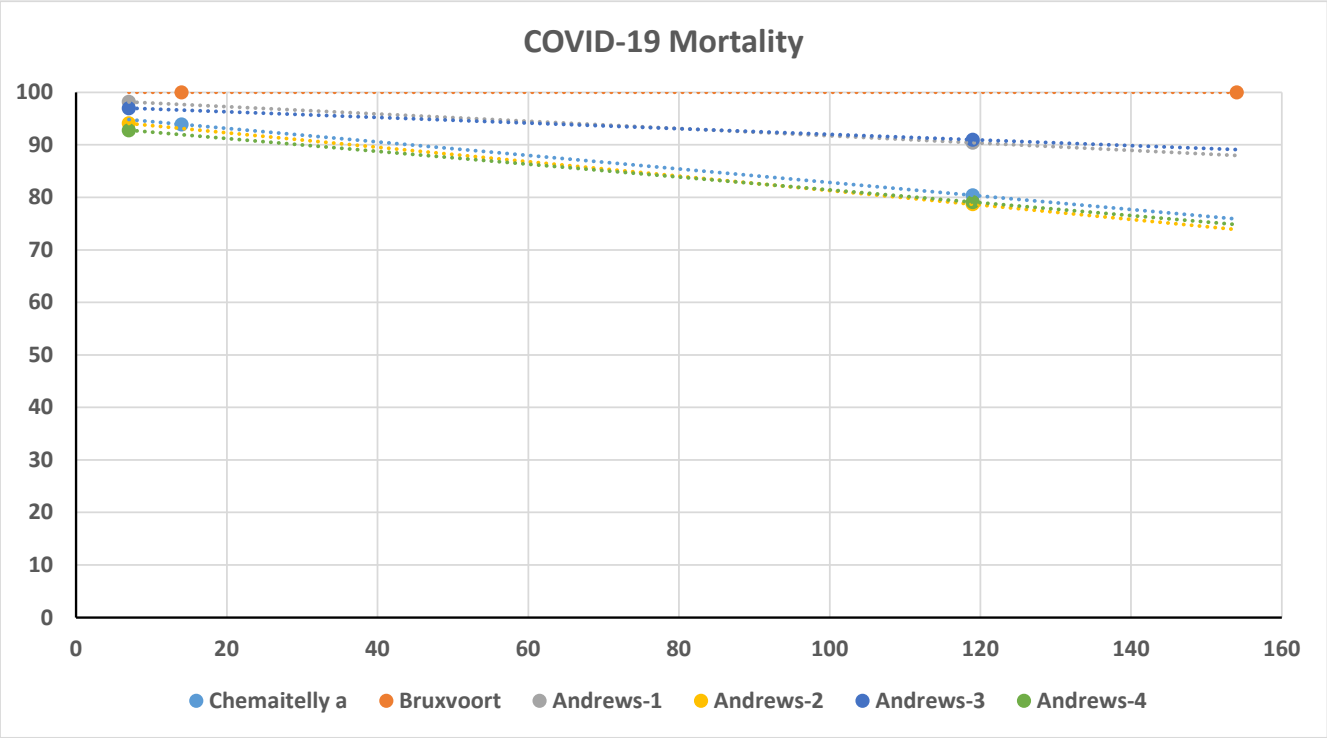
Figure 3S: Vaccine effectiveness for COVID-19 related hospitalisations in days since completion of a full vaccine schedule, with accompanying information on the vaccine, inference population, and variant of the included studies.



The lines indicate the trendline for each individual study (created using the trendline function in excel).

Author	Vaccine	Inference population	Variant
Tartof-1	BNT162b2	General (≥12 yrs)	No
Bruxvoort	mRNA-1273	General (≥18 yrs)	No
Tartof-2	BNT162b2	≥65 yrs	No
Thompson-1	BNT162b2	≥50 yrs	No
Thompson-2	mRNA-1273	≥50 yrs	No
Thompson-3	Mixed	≥50 yrs	No
Andrews-1	BNT162b2	General (≥16 yrs)	Delta
Andrews-2	ChAdOx1	General (≥16 yrs)	Delta
Andrews-3	BNT162b2	≥65+ yrs	Delta
Andrews-4	ChAdOx1	≥65+ yrs	Delta
Andrews-5	BNT162b2	≥65 yrs with clinically extreme vulnerability	Delta

Figure 4S: Vaccine effectiveness for COVID-19 related deaths (mortality) in days since completion of a full vaccine schedule, with accompanying information on the vaccine, inference population, and variant of the included studies.



The lines indicate the trendline for each individual study (created using the trendline function in excel).

Author	Vaccine	Inference population	Variant
Chemaitelly a	BNT162b2	General (assume adult only)	No
Bruxvoort	mRNA-1273	General (≥18 yrs)	No
Andrews-1	BNT162b2	General (≥16 yrs)	Delta
Andrews-2	ChAdOx1	General (≥16 yrs)	Delta
Andrews-3	BNT162b2	≥65 yrs	Delta
Andrews-4	ChAdOx1	≥65 yrs	Delta

TABLE 2S - Risk of Bias Assessment of included studies

First author	Study Design	Confirming vaccination	Database used	Assignment of infection start	Verification of symptoms	Accounting for non-immune period	Inc participants with prior COVID	Accounting for calendar time	Adjustments	Testing freq
Akhrass	Low	Low	Low	Low	Low	Low	Low	Critical	No info	Low
Andrews	Moderate	Low	Low	Low	Low	Low	Low	Low	Low	Moderate
Bruxvoort	Low	Low	Low	Low	Low	Low	Low	Moderate	Low	Moderate
Chemaitelly a	Moderate	Low	Low	Low	Low	Low	Low	Low	Low	Moderate
Chemaitelly b	Low	Low	Low	Low	Low	Low	Low	Low	Low	Moderate
Goldenberg	Low	Low	Low	Low	Low	Low	Low	Low	Low	Moderate
Fowlkes	Low	Moderate	Low	Low	Low	Low	Low	Low	Low	Low
Madhi	Low	Low	Low	Low	Low	Low	Low	Moderate	Moderate	Low
Sadoff	Low	Low	Low	Low	Low	Low	Low	Moderate	Low	Low
Tartof	Low	Low	Low	Low	Low	Low	Moderate	Low	Low	Moderate
Thomas	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Thompson	Moderate	Low	Low	Low	Low	Low	No info	Low	Low	Moderate

TABLE 3S - List of studies excluded at the extraction phase and reasons (late exclusions)

Author	Article Title	Source / Journal	Generic reasons	Detailed reasons
Aslam, et al.	Clinical effectiveness of COVID-19 vaccination in solid organ transplant recipients	Transpl Infect Dis.	Wrong control group	The control group had a mixed of unvaccinated and partially vaccinated
Ben Dov, et al.	Impact of tozinameran (BNT162b2) mRNA vaccine on kidney transplant and chronic dialysis patients: 3-5 months followup	medRxiv	Wrong outcome	Data mainly focusing on immunogenicity findings.
Bianchi, et al.	BNT162b2 mRNA COVID-19 vaccine effectiveness in the prevention of SARS-CoV-2 Infection: A preliminary report	SSRN	Wrong outcome	K-M plot included the 14 days before full vaccination - the correct FUP is non-extractable (figure 1)
Cabezas, et al.	Associations of BNT162b2 vaccination with SARS-CoV-2 infection and hospital admission and death with covid-19 in nursing homes and healthcare workers in Catalonia: Prospective cohort study	BMJ	Wrong outcome	Prospective cohort evaluated VE data among nursing home residents, nursing home staff, and healthcare workers. Incidence rates, and adjusted hazard ratios for covid-19 infection according to vaccination status in study population is presented in Table 2 (but no information of individual level follow up; the authors presented only Exposure person days). Kaplan-Meier estimates of COVID infection according to vaccination status in study population is presented visually in Figure 3 (but no extractable information presented).
Israel, et al.	Elapsed time since BNT162b2 vaccine and risk of SARS-CoV-2 infection in a large cohort	medRxiv	Wrong outcome	Study included only vaccinated individuals. The authors presented risk of COVID infection according to the time since the vaccination (greater or lower than 146 days) in

				Table 3 (but no indication of individual level follow-up time).
Keehner, et al	Resurgence of SARS-CoV-2 Infection in a Highly Vaccinated Health System Workforce.	The New England Journal of Medicine	Wrong outcome	A series of cross-sectional analysis over months (no indication of individual level follow-up times)
Puranik, et al.	Comparison of two highly-effective mRNA vaccines for COVID-19 during periods of Alpha and Delta variant prevalence	medRxiv	Wrong outcome	Retrospective cohort study (matched unvaccinated and vaccinated individuals). The authors present Kaplan-Meier plots with VE data, but no extractable information (Figure 2 and Figure S2). Additional VE by month data presented in the Table 3 for Breakthrough infections, that comes from modelling (but no indication of the individual level follow-up time across the specified time period)
Rovida, et al.	SARS-CoV-2 vaccine breakthrough infections are asymptomatic or mildly symptomatic and are infrequently transmitted	medRxiv	Wrong intervention	Not enough time of follow up (4 months criterion)
Shrestha, et al.	Necessity of COVID-19 vaccination in previously infected individuals	medRxiv	Wrong outcome	A retrospective cohort study that estimated cumulative incidence of COVID infection over five months, among previously infected subjects who received the vaccine, compared with those of previously infected subjects who remained unvaccinated, previously uninfected subjects who received the vaccine, and previously uninfected subjects who remained unvaccinated. Figure 3 reports Simon-Makuch plot with cumulative incidence of COVID-19, but has no extractable information (authors presented only the number

				of individuals at risk among all the groups of interest)
Starrfelt, et al.	High vaccine effectiveness against COVID-19 infection and severe disease among residents and staff of long-term care facilities in Norway, November – June 2021	medRxiv	Wrong intervention	A cohort study, estimating vaccine effectiveness among residents and health care workers in long-term care facilities. COVID-19 vaccine effectiveness against infection, hospitalisation and death presented from Cox models in Tables 2 and 3 (but no information about individual level follow up; authors presented only person time at risk.
Tenforde, et al.	Sustained Effectiveness of Pfizer-BioNTech and Moderna Vaccines Against COVID-19 Associated Hospitalizations Among Adults - United States, March-July 2021	Morbidity and Mortality Weekly Report (MMWR) - CDC	Wrong outcome	Case-control study, assessing vaccine effectiveness against hospitalization in a multistate network over 24 weeks. Vaccine effectiveness across diverse time points presented in Supplementary material (as figures, with no extractable information)
Thomas, et al.	Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine through 6 Months	The New England Journal of Medicine	Duplicated	Pre-print version of the article (the published version is included in the main document)
Tré-Hardy, et al.	Six-month interim analysis of ongoing immunogenicity surveillance of the mRNA-1273 vaccine in healthcare workers: A third dose is expected	Journal of Infection	Wrong outcome	Data mainly focusing on immunogenicity findings.
Waldhorn, et al.	Six Month Efficacy and Toxicity Profile of BNT162b2 Vaccine in Cancer Patients with Solid Tumors	Cancer Discovery	Wrong outcome	Data mainly focusing on immunogenicity findings. Also, study included only vaccinated individuals (no unvaccinated controls)

TABLE 4S - List of excluded studies at full-text screening phase

Author	Article Title	Source	Reason
Abbasi	COVID-19 mRNA Vaccines Blunt Breakthrough Infection Severity	JAMA - Journal of the American Medical Association	wrong intervention
Abbasi	Oldest Adults Need 2 mRNA Vaccine Doses to Neutralize SARS-CoV-2	JAMA - Journal of the American Medical Association	wrong publication type
Abdool Karim & de Oliveira	New SARS-CoV-2 variants - Clinical, public health, and vaccine implications	New England Journal of Medicine	wrong intervention
Absalon et al.	Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. Reply	The New England Journal of Medicine	wrong intervention
Abu Raddad et al.	Effect of vaccination and of prior infection on infectiousness of vaccine breakthrough infections and reinfections	Preprint - medRxiv	wrong outcome
Abu Raddad et al.	Protection afforded by the BNT162b2 and mRNA-1273 COVID-19 vaccines in fully vaccinated cohorts with and without prior infection	Preprint - medRxiv	wrong intervention
Abu-Raddad et al.	Effectiveness of the BNT162b2 Covid-19 Vaccine against the B.1.1.7 and B.1.351 Variants	The New England Journal of Medicine	wrong intervention
Abu-Raddad et al.	Pfizer-BioNTech mRNA BNT162b2 Covid-19 vaccine protection against variants of concern after one versus two doses	Journal of Travel Medicine	wrong intervention
Ackland et al.	Evolution of case fatality rates in the second wave of coronavirus in England: effects of false positives, a Variant of Concern and vaccination	Preprint - medRxiv	wrong intervention
Adhikari & Spong	COVID-19 Vaccination in Pregnant and Lactating Women	JAMA - Journal of the American Medical Association	wrong study design
Adibi et al.	Continuing COVID-19 Vaccination of Front-Line Workers in British Columbia with the AstraZeneca Vaccine: Benefits in the Face of Increased Risk for Prothrombotic Thrombocytopenia	Preprint - medRxiv	wrong outcome

Al Qahtani et al.	Morbidity and mortality from COVID-19 post-vaccination breakthrough infections in association with vaccines and the emergence of variants in Bahrain	Preprint - Research Square	wrong intervention
Alali et al.	Effectiveness of BNT162b2 and ChAdOx1 vaccines against symptomatic COVID-19 among Healthcare Workers in Kuwait: A retrospective cohort study	Preprint - medRxiv	wrong intervention
Albach et al.	Successful BNT162b2 booster vaccinations in a patient with rheumatoid arthritis and initially negative antibody response	Annals of the Rheumatic Diseases	wrong study design
Alencar et al.	High Effectiveness of SARS-CoV-2 Vaccines in Reducing COVID-19-Related Deaths in over 75-Year-Olds, Ceara State, Brazil	Tropical Medicine and Infectious Disease	wrong intervention
Alholm et al.	SARS-CoV-2 vaccination in gynecologic oncology	European Journal of Gynaecological Oncology	wrong publication type
Ali et al.	Evaluation of mRNA-1273 SARS-CoV-2 Vaccine in Adolescents	The New England Journal of Medicine	wrong intervention
Alroy-Preis et al.	Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalisations, and deaths following a nationwide vaccination campaign in Israel: an observational study using national surveillance data	The Lancet	wrong intervention
Altmann et al.	Immunity to SARS-CoV-2 variants of concern	Science	wrong publication type
Amatya et al.	COVID-19 in fully vaccinated Everest trekkers in Nepal	Journal of Travel Medicine	wrong study design
Amirthalingam et al.	Higher serological responses and increased vaccine effectiveness demonstrate the value of extended vaccine schedules in combating COVID-19 in England	Preprint - medRxiv	wrong intervention
Amit et al.	COVID-19 vaccine efficacy data: solid enough to delay second dose? - Authors' reply	The Lancet	wrong study design
Amit et al.	Early rate reductions of SARS-CoV-2 infection and COVID-19 in BNT162b2 vaccine recipients	The Lancet	wrong intervention

Andrejko et al.	Prevention of COVID-19 by mRNA-based vaccines within the general population of California	Clinical Infectious Diseases	wrong intervention
Andrejko et al.	Early evidence of COVID-19 vaccine effectiveness within the general population of California	Hand search; Preprint - medRxiv	wrong intervention
Angel et al.	Association between Vaccination with BNT162b2 and Incidence of Symptomatic and Asymptomatic SARS-CoV-2 Infections among Health Care Workers	JAMA - Journal of the American Medical Association	wrong intervention
Anjan et al.	Breakthrough COVID-19 infections after mRNA vaccination in Solid Organ Transplant Recipients in Miami, Florida	Transplantation	wrong intervention
Anonymous	Exam 2: Effectiveness of SARS-CoV-2 vaccination in a Veterans Affairs Cohort of Inflammatory Bowel Disease Patients with Diverse Exposure to Immunosuppressive Medications	Gastroenterology	wrong publication type
Aran	Estimating real-world COVID-19 vaccine effectiveness in Israel	Preprint - medRxiv	wrong intervention
Arnold et al.	Are vaccines safe in patients with Long COVID? A prospective observational study	Preprint - medRxiv	wrong intervention
Azamgarhi et al.	BNT162b2 vaccine uptake and effectiveness in UK healthcare workers - a single centre cohort study	Nature Communications	wrong intervention
Baden et al.	Efficacy and safety of the mRNA-1273 SARS-CoV-2 vaccine	New England Journal of Medicine	wrong intervention
Bahl et al.	Vaccination reduces need for emergency care in breakthrough COVID-19 infections: A multicenter cohort study	Preprint - medRxiv	wrong intervention
Bailly et al.	BNT162b2 mRNA vaccination did not prevent an outbreak of SARS COV-2 variant 501Y.V2 in an elderly nursing home but reduced transmission and disease severity	Clinical Infectious Diseases	wrong intervention
Balicer et al.	Effectiveness of the BNT162b2 mRNA COVID-19 Vaccine in Pregnancy	Preprint – Research Square	wrong intervention
Baltas et al.	Post-vaccination COVID-19: A case-control study and genomic analysis of 119 breakthrough infections in partially vaccinated individuals	Clinical Infectious Diseases	wrong intervention

Banon et al.	BNT162b2 Messenger RNA COVID-19 Vaccine Effectiveness in Patients With Inflammatory Bowel Disease: Preliminary Real-World Data During Mass Vaccination Campaign	Gastroenterology	duplicated
Bar On et al.	BNT162b2 vaccine booster dose protection: A nationwide study from Israel	Preprint - medRxiv	wrong intervention
Barbosa et al.	High effectiveness of sars-cov-2 vaccines in reducing covid-19-related deaths in over 75-year-olds, Ceara State, Brazil	Tropical Medicine and Infectious Disease	duplicated
Barlow et al.	Effectiveness of COVID-19 Vaccines Against SARS-CoV-2 Infection During a Delta Variant Epidemic Surge in Multnomah County, Oregon, July 2021	Preprint - medRxiv	wrong intervention
Barnabas et al.	A Public Health COVID-19 Vaccination Strategy to Maximize the Health Gains for Every Single Vaccine Dose	Annals of Internal Medicine	wrong outcome
Barrière et al.	Impaired immunogenicity of BNT162b2 anti-SARS-CoV-2 vaccine in patients treated for solid tumors	Annals of Oncology	wrong outcome
Barros et al.	Estimating the early impact of vaccination against COVID-19 on deaths among elderly people in Brazil: Analyses of routinely-collected data on vaccine coverage and mortality	EClinicalMedicine	duplicated
Baum et al.	Effectiveness of vaccination against SARS-CoV-2 infection and Covid-19 hospitalization among Finnish elderly and chronically ill—An interim analysis of a nationwide cohort study	Preprint - medRxiv	wrong intervention
Belmin et al.	First-Dose Coronavirus 2019 Vaccination Coverage among the Residents of Long-Term Care Facilities in France	Gerontology	wrong outcome
Ben-Tov et al.	BNT162b2 Messenger RNA COVID-19 Vaccine Effectiveness in Patients With Inflammatory Bowel Disease: Preliminary Real-World Data During Mass Vaccination Campaign	Gastroenterology	wrong intervention
Benenson et al.	BNT162b2 mRNA Covid-19 Vaccine Effectiveness among Health Care Workers	The New England Journal of Medicine	wrong intervention
Benjamini et al.	Safety and efficacy of BNT162b mRNA Covid19 Vaccine in patients with chronic lymphocytic leukemia	Haematologica	wrong outcome

Benotmane et al.	Low immunization rates among kidney transplant recipients who received 2 doses of the mRNA-1273 SARS-CoV-2 vaccine	Kidney International	wrong outcome
Benotmane et al.	Weak anti-SARS-CoV-2 antibody response after the first injection of an mRNA COVID-19 vaccine in kidney transplant recipients	Kidney International	wrong outcome
Bergwerk et al.	Covid-19 Breakthrough Infections in Vaccinated Health Care Workers	The New England Journal of Medicine	wrong outcome
Bermingham et al.	Estimating the effectiveness of first dose of COVID-19 vaccine against mortality in England: a quasi-experimental study	Preprint - medRxiv	wrong intervention
Bernal et al.	Early effectiveness of COVID-19 vaccination with BNT162b2 mRNA vaccine and ChAdOx1 adenovirus vector vaccine on symptomatic disease, hospitalisations and mortality in older adults in England	Preprint - medRxiv	wrong intervention
Bernal et al.	Effectiveness of BNT162b2 mRNA vaccine and ChAdOx1 adenovirus vector vaccine on mortality following COVID-19	Preprint - medRxiv	wrong intervention
Bernal et al.	Effectiveness of COVID-19 vaccines against the B.1.617.2 variant	The New England Journal of Medicine	wrong intervention
Bhattacharya et al.	Evaluation of the dose-effect association between the number of doses and duration since the last dose of COVID-19 vaccine, and its efficacy in preventing the disease and reducing disease severity: A single centre, cross-sectional analytical study from India	Diabetes and Metabolic Syndrome: Clinical Research and Reviews	wrong study design
Bianchi et al.	BNT162b2 mRNA COVID-19 vaccine effectiveness in the prevention of SARS-CoV-2 Infection: A preliminary report	Journal of Infectious Diseases	wrong intervention
Bird et al.	Response to first vaccination against SARS-CoV-2 in patients with multiple myeloma	The Lancet Haematology	wrong intervention
Bjork et al.	Effectiveness of the BNT162b2 vaccine in preventing COVID-19 in the working age population - first results from a cohort study in Southern Sweden	Preprint - medRxiv	wrong intervention
Bliden et al.	Evolution of Anti-SARS-CoV-2 IgG Antibody and IgG Avidity Post Pfizer and Moderna mRNA Vaccinations	Preprint - medRxiv	wrong outcome
Bobdey et al.	Effectiveness of ChAdOx1 nCOV-19 Vaccine: Experience of a tertiary care institute	Medical Journal Armed Forces India	wrong intervention

Bongiovanni et al.	Evaluation of the immune response to COVID-19 vaccine mRNA BNT162b2 and correlation with previous COVID-19 infection	Journal of Clinical Virology	wrong outcome
Bookstein Peretz et al.	Short-term outcome of pregnant women vaccinated with BNT162b2 mRNA COVID-19 vaccine	Ultrasound in Obstetrics & Gynecology	wrong intervention
Bouton et al.	COVID-19 vaccine impact on rates of SARS-CoV-2 cases and post vaccination strain sequences among healthcare workers at an urban academic medical center: a prospective cohort study	Preprint - medRxiv	wrong outcome
Boyarsky et al.	Antibody response to 2-dose sars-cov-2 mrna vaccine series in solid organ transplant recipients	JAMA - Journal of the American Medical Association	wrong intervention
Braeye et al.	Vaccine effectiveness against infection and onwards transmission of COVID-19: Analysis of Belgian contact tracing data, January-June 2021	Vaccine	wrong intervention
Brinkley-Rubinstein et al.	Breakthrough SARS-CoV-2 Infections in Prison after Vaccination	The New England Journal of Medicine	wrong intervention
Brosh-Nissimov et al.	BNT162b2 vaccine breakthrough: clinical characteristics of 152 fully vaccinated hospitalized COVID-19 patients in Israel	Clinical Microbiology and Infection	wrong outcome
Brouqui et al.	COVID-19 re-infection	European Journal of Clinical Investigation	wrong intervention
Brunner et al.	SARS-CoV-2 Postvaccination Infections Among Staff Members of a Tertiary Care University Hospital—Vienna, January-July 2021; an Exploratory Study on 8 500 Employees with Better Outcome of Vector than m-RNA Vaccine	Preprint - SSRN	wrong intervention
Bukhari et al.	Real-World Effectiveness of COVID-19 Vaccines: the Diverging Pattern of COVID-19 Cases and Deaths in Countries with High Vaccination Rates	Preprint - SSRN	wrong intervention
Buonfrate et al.	Antibody response induced by the BNT162b2 mRNA COVID-19 vaccine in a cohort of health-care workers, with or without prior SARS-CoV-2 infection: a prospective study	Clinical Microbiology and Infection	wrong intervention
Burd et al.	The Israeli study of Pfizer BNT162b2 vaccine in pregnancy: Considering maternal and neonatal benefits	Journal of Clinical Investigation	wrong publication type

Butt et al.	Effectiveness of the SARS-CoV-2 mRNA Vaccines in Pregnant Women	Preprint - Research Square	wrong intervention
Butt et al.	Outcomes among patients with breakthrough SARS-CoV-2 infection after vaccination in a high-risk national population	EClinicalMedicine	wrong intervention
Butt et al.	Rate and risk factors for breakthrough SARS-CoV-2 infection after vaccination	The Journal of Infection	wrong intervention
Butt et al.	SARS-CoV-2 Vaccine Effectiveness in a High-Risk National Population in a Real-World Setting	Annals of Internal Medicine	wrong intervention
Cabezas et al.	Effects of BNT162b2 mRNA Vaccination on COVID-19 Disease, Hospitalisation and Mortality in Nursing Homes and Healthcare Workers: A Prospective Cohort Study Including 28,594 Nursing Home Residents, 26,238 Nursing Home Staff, and 61,951 Healthcare Workers in Catalonia	Hand search; Preprint - SSRN	duplicated
Cabezas et al.	Effects of BNT162b2 mRNA Vaccination on COVID-19 Disease, Hospitalisation and Mortality in Nursing Homes and Healthcare Workers: A Prospective Cohort Study Including 28,594 Nursing Home Residents, 26,238 Nursing Home Staff, and 61,951 Healthcare Workers in Catalonia	Preprint - SSRN	wrong intervention
Carazo et al.	Single-dose mRNA vaccine effectiveness against SARS-CoV-2 in healthcare workers extending 16 weeks post-vaccination: a test-negative design from Quebec, Canada	Preprint - medRxiv	wrong intervention
Cerqueira Silva et al.	Influence of age on the effectiveness and duration of protection in Vaxzevria and CoronaVac vaccines	Preprint - medRxiv	wrong intervention
Charmet et al.	Impact of original, B.1.1.7, and B.1.351/P.1 SARS-CoV-2 lineages on vaccine effectiveness of two doses of COVID-19 mRNA vaccines: Results from a nationwide case-control study in France	The Lancet Regional Health-Europe	wrong intervention
Chauhan et al.	SARS-CoV-2 Vaccine-Induced Antibody Response and Reinfection in Persons with Past Natural Infection	Preprint - medRxiv	wrong intervention
Chemaitelly et al.	mRNA-1273 COVID-19 vaccine effectiveness against the B.1.1.7 and B.1.351 variants and severe COVID-19 disease in Qatar	Hand search; Nature Medicine	wrong intervention
Chemaitelly et al.	Pfizer-BioNTech mRNA BNT162b2 Covid-19 vaccine protection against variants of concern after one versus two doses	Journal of Travel Medicine	duplicated
Chemaitelly et al.	MRNA-1273 COVID-19 vaccine effectiveness against the B.1.1.7 and B.1.351 variants and severe COVID-19 disease in Qatar.	Nature Medicine	wrong intervention

Chin et al.	Effectiveness of COVID-19 Vaccines among Incarcerated People in California State Prisons: A Retrospective Cohort Study	Preprint - medRxiv	wrong intervention
Chodick et al.	The effectiveness of the TWO-DOSE BNT162b2 vaccine: analysis of real-world data	Clinical Infectious Diseases	wrong intervention
Christie et al.	Decreases in COVID-19 Cases, Emergency Department Visits, Hospital Admissions, and Deaths Among Older Adults Following the Introduction of COVID-19 Vaccine - United States, September 6, 2020-May 1, 2021	MMWR. Morbidity and mortality weekly report	wrong population
Chung et al.	Effectiveness of BNT162b2 and mRNA-1273 covid-19 vaccines against symptomatic SARS-CoV-2 infection and severe covid-19 outcomes in Ontario, Canada: Test negative design study	The BMJ	wrong intervention
Clemens et al.	Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 lineages circulating in Brazil; an exploratory analysis of a randomised controlled trial	Preprint - Research Square	wrong intervention
Cook et al.	Clinical characteristics and outcomes of COVID-19 breakthrough infections among vaccinated patients with systemic autoimmune rheumatic diseases	Preprint - medRxiv	wrong outcome
Corchado Garcia et al.	Real-world effectiveness of Ad26.COV2.S adenoviral vector vaccine for COVID-19	Preprint - medRxiv	wrong intervention
Cox et al.	An observational cohort study on the incidence of SARS-CoV-2 infection and B.1.1.7 variant infection in healthcare workers by antibody and vaccination status	Clinical Infectious Diseases	duplicated
Dagan et al.	BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Mass Vaccination Setting	The New England Journal of Medicine	wrong intervention
Dagan et al.	Effectiveness of the BNT162b2 mRNA COVID-19 vaccine in pregnancy	Nature Medicine	wrong intervention
Dahlem et al.	Humoral Response after SARS-CoV-2 mRNA Vaccination in a Cohort of Hemodialysis Patients and Kidney Transplant Recipients	Journal of the American Society of Nephrology	duplicated
Danthu et al.	Humoral Response after SARS-Cov-2 mRNA Vaccine in a Cohort of Hemodialysis Patients and Kidney Transplant Recipients	Journal of the American Society of Nephrology: JASN	wrong intervention

Das et al.	Relation of vaccination with severity, oxygen requirement and outcome of COVID-19 infection in Chattogram, Bangladesh	Preprint - medRxiv	wrong intervention
Dash et al.	Breakthrough SARS-CoV-2 infections in an eastern state of India: A preliminary report	Preprint - Research Square	wrong outcome
Dashdorj et al.	Direct Comparison of Antibody Responses to Four SARS-CoV-2 Vaccines in Mongolia	Preprint - medRxiv	wrong outcome
Deiana et al.	Impact of Full Vaccination with mRNA BNT162b2 on SARS-CoV-2 Infection: Genomic and Subgenomic Viral RNAs Detection in Nasopharyngeal Swab and Saliva of Health Care Workers	Microorganisms	wrong outcome
Domi et al.	The BNT162b2 vaccine is associated with lower new COVID-19 cases in nursing home residents and staff	Journal of the American Geriatrics Society	wrong intervention
Donadio et al.	Asymptomatic COVID-19 cases among older patients despite BNT162b2 vaccination: A case series in a geriatric rehabilitation ward during an outbreak	The Journal of Infection	wrong intervention
Du Plessis et al.	Efficacy of the ChAdOx1 nCoV-19 Covid-19 Vaccine against the B.1.351 Variant	New England Journal of Medicine	duplicated
Dulovic et al.	Diminishing immune responses against variants of concern in dialysis patients four months after SARS-CoV-2 mRNA vaccination	Preprint - medRxiv	wrong outcome
Ebinger et al.	Antibody responses to the BNT162b2 mRNA vaccine in individuals previously infected with SARS-CoV-2	Nature Medicine	wrong intervention
Ebinger et al.	Prior COVID-19 Infection and Antibody Response to Single Versus Double Dose mRNA SARS-CoV-2 Vaccination	Preprint - medRxiv	wrong outcome
Edelstein et al.	BNT 13b2 Pfizer vaccine protects against SARS-CoV-2 respiratory mucosal colonization even after prolonged exposure to positive family members	The Journal of Hospital Infection	wrong outcome
Efrati et al.	Safety and humoral responses to BNT162b2 mRNA vaccination of SARS-CoV-2 previously infected and naive populations	Scientific Reports	wrong outcome

Ella et al.	Efficacy, safety, and lot to lot immunogenicity of an inactivated SARS-CoV-2 vaccine (BBV152): a, double-blind, randomised, controlled phase 3 trial	Preprint - medRxiv	wrong intervention
Elliott et al.	REACT-1 round 13 final report: exponential growth, high prevalence of SARS-CoV-2 and vaccine effectiveness associated with Delta variant in England during May to July 2021	Hand search; Preprint - medRxiv	wrong intervention
Emary et al.	Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 variant of concern 202012/01 (B.1.1.7): an exploratory analysis of a randomised controlled trial	The Lancet	wrong intervention
Emborg et al.	Vaccine effectiveness of the BNT162b2 mRNA COVID-19 vaccine against RT-PCR confirmed SARS-CoV-2 infections, hospitalisations and mortality in prioritised risk groups	Preprint - medRxiv	wrong intervention
Espi et al.	Justification, safety, and efficacy of a third dose of mRNA vaccine in maintenance hemodialysis patients: a prospective observational study	Preprint - medRxiv	wrong outcome
Fabiani et al.	Effectiveness of the comirnaty (BNT162b2, BioNTech/Pfizer) vaccine in preventing SARS-CoV-2 infection among healthcare workers, Treviso province, Veneto region, Italy, 27 December 2020 to 24 March 2021	Eurosurveillance	wrong intervention
Fabiani et al.	Risk of SARS-CoV-2 infection and subsequent hospital admission and death at different time intervals since first dose of COVID-19 vaccine administration, Italy, 27 December 2020 to mid-April 2021	Eurosurveillance	wrong intervention
Faria et al.	Performance of vaccination with CoronaVac in a cohort of healthcare workers (HCW) - preliminary report	Preprint - medRxiv	wrong intervention
Feng et al.	Correlates of protection against symptomatic and asymptomatic SARS-CoV-2 infection	Preprint - medRxiv	wrong outcome
Fernando et al.	Neutralizing SARS-CoV-2 Antibody Response and Protective Effect of 2 Doses of ChAdOx1 nCoV-19 and BBV152 Vaccines in hemodialysis Patients: A Preliminary Report	Kidney International Reports	wrong outcome
Firinu et al.	Evaluation of antibody response to BNT162b2 mRNA COVID-19 vaccine in patients affected by immune-mediated inflammatory diseases up to 5 months after vaccination	Preprint - Research Square	wrong outcome

Folegatti et al.	Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial	Hand search; The Lancet	wrong outcome
Foulkes et al.	COVID-19 vaccine coverage in health-care workers in England and effectiveness of BNT162b2 mRNA vaccine against infection (SIREN): a prospective, multicentre, cohort study	The Lancet	wrong intervention
Frenck et al.	Safety, immunogenicity, and efficacy of the BNT162B2 covid-19 vaccine in adolescents	New England Journal of Medicine	wrong intervention
Friedrichs et al.	Immunogenicity and safety of anti-SARS-CoV-2 mRNA vaccines in patients with chronic inflammatory conditions and immunosuppressive therapy in a monocentric cohort	Annals of the Rheumatic Diseases	wrong intervention
Fuca et al.	Antibody response to mRNA-1273 SARS-COV-2 vaccine in hemodialysis patients with and without prior COVID-19	Clinical Journal of the American Society of Nephrology	wrong intervention
Furer et al.	Immunogenicity and safety of the BNT162B2 mRNA COVID-19 vaccine in adult patients with autoimmune inflammatory rheumatic diseases and general population: A multicenter study	Annals of the Rheumatic Diseases	wrong intervention
Garvey et al.	Early observations on the impact of a healthcare worker COVID-19 vaccination programme at a major UK tertiary centre	The Journal of Infection	wrong intervention
Gazit et al.	BNT162b2 mRNA Vaccine Effectiveness Given Confirmed Exposure; Analysis of Household Members of COVID-19 Patients	Preprint - medRxiv	wrong intervention
Gazit et al.	Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections	Preprint - medRxiv	wrong intervention
Geysels et al.	SARS-CoV-2 vaccine breakthrough infections among healthcare workers in a large Belgian hospital network	Infection Control and Hospital Epidemiology	wrong intervention
Ghosh et al.	COVISHIELD (AZD1222) VaccINe effectiveness among healthcare and frontline Workers of INdian Armed Forces: Interim results of VIN-WIN cohort study	Medical Journal Armed Forces India	wrong intervention
Giansante et al.	COVID-19 vaccine effectiveness among the staff of the Bologna Health Trust, Italy, December 2020-April 2021	Acta Bio-medica: Atenei Parmensis	wrong intervention
Gilbert et al.	Immune Correlates Analysis of the mRNA-1273 COVID-19 Vaccine Efficacy Trial	Preprint - medRxiv	wrong intervention

Glampson et al.	North West London Covid-19 Vaccination Programme: Real-world evidence for Vaccine uptake and effectiveness: Retrospective Cohort Study	JMIR Public Health and Surveillance	wrong intervention
Goes et al.	New infections by SARS-CoV-2 variants of concern after natural infections and post-vaccination in Rio de Janeiro, Brazil	Infection, Genetics and Evolution	wrong study design
Gohil et al.	Asymptomatic and Symptomatic COVID-19 Infections Among Health Care Personnel Before and After Vaccination	JAMA network open	wrong intervention
Goldberg et al.	Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2 vaccine protection: A three-month nationwide experience from Israel	Preprint - medRxiv	wrong intervention
Goldshtein et al.	Association Between BNT162b2 Vaccination and Incidence of SARS-CoV-2 Infection in Pregnant Women	JAMA	wrong intervention
Gomes et al.	Is the BioNTech-Pfizer COVID-19 vaccination effective in elderly populations? Results from population data from Bavaria, Germany	Preprint - medRxiv	wrong intervention
Gounant et al.	Efficacy of SARS-CoV-2 vaccine in thoracic cancer patients: a prospective study supporting a third dose in patients with minimal serologic response after two vaccine doses	Preprint - medRxiv	wrong intervention
Gower et al.	Effectiveness of Covid-19 Vaccines against the B.1.617.2 (Delta) Variant	New England Journal of Medicine	duplicated
Gower et al.	Effectiveness of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines on covid-19 related symptoms, hospital admissions, and mortality in older adults in England: Test negative case-control study	The BMJ	duplicated
Gram et al.	Vaccine effectiveness when combining the ChAdOx1 vaccine as the first dose with an mRNA COVID-19 vaccine as the second dose	Preprint - medRxiv	wrong intervention
Guarino et al.	Effectiveness of SARS-Cov-2 vaccination in liver transplanted patients: the debate is open!	Journal of Hepatology	wrong outcome
Guha et al.	The incidence and in-hospital mortality of COVID-19 patients post-vaccination in eastern India	Preprint - medRxiv	wrong study design

Haas et al.	Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalisations, and deaths following a nationwide vaccination campaign in Israel: an observational study using national surveillance data	The Lancet	wrong intervention
Haas et al.	Infections, Hospitalizations, and Deaths Averted Via Direct Effects of the Pfizer-BioNTech BNT162b2 mRNA COVID-19 Vaccine in a Nationwide Vaccination Campaign, Israel	Preprint - SSRN	wrong intervention
Harris et al.	Impact of vaccination on household transmission of SARS-COV-2 in England	Hand search; Preprint - medRxiv	wrong intervention
Havers et al.	COVID-19-associated hospitalizations among vaccinated and unvaccinated adults ≥18 years - COVID-NET, 13 states, January 1 - July 24, 2021	Preprint - medRxiv	wrong outcome
Herishanu et al.	Efficacy of the BNT162b2 mRNA COVID-19 vaccine in patients with chronic lymphocytic leukemia	Blood	wrong outcome
Herzberg et al.	SARS-CoV-2-antibody response in health care workers after vaccination or natural infection in a longitudinal observational study	Preprint - medRxiv	wrong intervention
Heudel et al.	Reduced SARS-CoV-2 infection and death after two doses of COVID-19 vaccines in a series of 1503 cancer patients	Annals of Oncology	wrong intervention
Hitchings et al.	Effectiveness of the ChAdOx1 vaccine in the elderly during SARS-CoV-2 Gamma variant transmission in Brazil	Preprint - medRxiv	wrong intervention
Hoehl et al.	A new group at increased risk of a SARS-CoV-2 infection emerges: The recently vaccinated	Vaccine	wrong intervention
Hollinghurst et al.	COVID-19 Infection Risk amongst 14,104 Vaccinated Care Home Residents: A national observational longitudinal cohort study in Wales, United Kingdom, December 2020 to March 2021	Preprint - medRxiv	wrong intervention
Horst	Covid-19 and Patients with IBD: Who Is at Highest Risk for Severe Complications?	Digestive Diseases and Sciences	wrong publication type
Hu et al.	Effectiveness of inactive COVID-19 vaccines against severe illness in B.1.617.2 (Delta) variant-infected patients in Jiangsu, China	Preprint - medRxiv	wrong intervention
Hung & Poland	Single-dose Oxford-AstraZeneca COVID-19 vaccine followed by a 12-week booster	The Lancet	wrong intervention

Hyams et al.	Effectiveness of BNT162b2 and ChAdOx1 nCoV-19 COVID-19 vaccination at preventing hospitalisations in people aged at least 80 years: a test-negative, case-control study	The Lancet Infectious Diseases	wrong intervention
Hyams et al.	Assessing the Effectiveness of BNT162b2 and ChAdOx1nCoV-19 COVID-19 Vaccination in Prevention of Hospitalisations in Elderly and Frail Adults: A Single Centre Test Negative Case-Control Study	Hand search; Preprint - SSRN	wrong intervention
Iliaki et al.	COVID-19 Vaccine Efficacy in a Diverse Urban Healthcare Worker Population	Preprint - medRxiv	wrong intervention
Ismail et al.	Effectiveness of BNT162b2 mRNA and ChAdOx1 adenovirus vector COVID-19 vaccines on risk of hospitalisation among older adults in England: an observational study using surveillance data	Hand search - Public Health England preprint	wrong intervention
Israel et al.	Large-scale study of antibody titer decay following BNT162b2 mRNA vaccine or SARS-CoV-2 infection	Preprint - medRxiv	wrong outcome
Issac et al.	SARS-CoV-2 Breakthrough Infections among the Healthcare Workers Post-Vaccination with ChAdOx1 nCoV-19 Vaccine in the South Indian State of Kerala	Preprint - medRxiv	wrong intervention
Jablonska et al.	The real-life impact of vaccination on COVID-19 mortality in Europe and Israel	Preprint - medRxiv	wrong population
Jacobson et al.	Post-vaccination SARS-CoV-2 infections and incidence of presumptive B.1.427/B.1.429 variant among healthcare personnel at a northern California academic medical center	Clinical Infectious Diseases	wrong intervention
Jacobson et al.	Post-vaccination SARS-CoV-2 infections and incidence of the B.1.427/B.1.429 variant among healthcare personnel at a northern California academic medical center	Preprint - medRxiv	duplicated
Jacquemont et al.	Minimal change disease relapse following SARS-CoV-2 mRNA vaccine	Kidney International	wrong study design
Jagadeesh Kumar et al.	Clinical outcomes in vaccinated individuals hospitalized with Delta variant of SARS-CoV-2	Preprint - medRxiv	wrong intervention
Jara et al.	Effectiveness of an Inactivated SARS-CoV-2 Vaccine in Chile	Hand search; New England Journal of Medicine	wrong intervention

Jeulin et al.	Comparative analysis of post-vaccination anti-spike IgG antibodies in old Nursing Home Residents and in middle-aged Healthcare workers	Preprint - medRxiv	wrong outcome
Kale et al.	Clinicogenomic analysis of breakthrough infections by SARS CoV2 variants after ChAdOx1 nCoV-19 vaccination in healthcare workers	Hand search; Preprint - medRxiv	wrong intervention
Kamar et al.	Three Doses of an mRNA Covid-19 Vaccine in Solid-Organ Transplant Recipients	The New England Journal of Medicine	wrong intervention
Kannian et al.	Booster and anergic effects of the Covishield vaccine among healthcare workers in South India	Preprint - medRxiv	wrong outcome
Katz et al.	Covid-19 Vaccine Effectiveness in Healthcare Personnel in six Israeli Hospitals (CoVEHPI)	Preprint - medRxiv	wrong intervention
Kaur et al.	Occurrence of COVID-19 in priority groups receiving ChAdOx1 nCoV-19 coronavirus vaccine (recombinant): a preliminary analysis from north India	Journal of Medical Virology	wrong intervention
Keegan et al.	Progress of the Delta variant and erosion of vaccine effectiveness, a warning from Utah	Preprint - medRxiv	wrong study design
Keehner et al.	SARS-CoV-2 Infection after Vaccination in Health Care Workers in California	The New England Journal of Medicine	wrong intervention
Kepten et al.	BNT162B2 mRNA covid-19 vaccine in a nationwide mass vaccination setting	New England Journal of Medicine	duplicated
Kertes et al.	Effectiveness of the mRNA BNT162b2 vaccine six months after vaccination: Findings from a large Israeli HMO.	Hand search; Preprint - medRxiv	wrong control
Khan et al.	Effectiveness of SARS-CoV-2 Vaccination in a Veterans Affairs Cohort of Patients With Inflammatory Bowel Disease With Diverse Exposure to Immunosuppressive Medications	Gastroenterology	wrong intervention
Kim et al.	mRNA Vaccine Effectiveness against COVID-19 among Symptomatic Outpatients Aged â‰¥16 Years in the United States, February - May 2021	The Journal of Infectious Diseases	wrong intervention
Kislaya et al.	Delta variant and mRNA Covid-19 vaccines effectiveness: higher odds of vaccine infection breakthroughs	Preprint - medRxiv	wrong intervention

Kissling et al.	Vaccine effectiveness against symptomatic SARS-CoV-2 infection in adults aged 65 years and older in primary care: I-MOVE-COVID-19 project, Europe, December 2020 to May 2021	Hand search; Eurosurveillance	wrong intervention
Knobel et al.	Coronavirus disease 2019 (COVID-19) mRNA vaccine effectiveness in asymptomatic healthcare workers	Infection Control and Hospital Epidemiology	wrong intervention
Knobel et al.	COVID-19 mRNA vaccine effectiveness in asymptomatic healthcare workers	Infection Control and Hospital Epidemiology	wrong intervention
Knoll et al.	Oxford-AstraZeneca COVID-19 vaccine efficacy	The Lancet	wrong publication type
Kontou et al.	Antibody response following a two-dose mRNA vaccination regimen, in health care workers of a tertiary hospital in Athens, Greece	Journal of Personalized Medicine	wrong intervention
Kugeler et al.	Estimating the number of symptomatic SARS-CoV-2 infections among vaccinated individuals in the United State - January-April, 2021	Preprint - medRxiv	wrong study design
Kustin et al.	Evidence for increased breakthrough rates of SARS-CoV-2 variants of concern in BNT162b2 mRNA vaccinated individuals	Preprint - medRxiv	wrong study design
Lange et al.	Immune response to COVID-19 mRNA vaccine-a pilot study	Vaccines	wrong intervention
Lanini et al.	A single intramuscular injection of monoclonal antibody MAD0004J08 induces in healthy adults SARS-CoV-2 neutralising antibody titres exceeding those induced by infection and vaccination	Preprint - medRxiv	wrong intervention
Lanthier et al.	[In subjects 16 years of age and older, is messenger RNA vaccine BNT162b2 against COVID-19 effective and safe?]	La Revue de Médecine Interne	wrong intervention
Layan et al.	Impact of BNT162b2 vaccination and isolation on SARS-CoV-2 transmission in Israeli households: an observational study	Preprint - medRxiv	wrong intervention
Lillie et al.	First dose of BNT162b2 mRNA vaccine in a Health Care Worker cohort is associated with reduced symptomatic and asymptomatic SARS-CoV-2 infection	Clinical Infectious Diseases	wrong intervention
Lo Sasso et al.	Evaluation of Anti-SARS-Cov-2 S-RBD IgG Antibodies after COVID-19 mRNA BNT162b2 Vaccine	Diagnostics (Basel, Switzerland)	wrong outcome
Lopez Bernal et al.	Effectiveness of Covid-19 Vaccines against the B.1.617.2 (Delta) Variant	The New England Journal of Medicine	duplicated

Lopez Bernal et al.	Effectiveness of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines on covid-19 related symptoms, hospital admissions, and mortality in older adults in England: test negative case-control study	BMJ (Clinical Research Ed.)	wrong intervention
Lumley et al.	An observational cohort study on the incidence of SARS-CoV-2 infection and B.1.1.7 variant infection in healthcare workers by antibody and vaccination status	Preprint - medRxiv	duplicated
Lumley et al.	An observational cohort study on the incidence of SARS-CoV-2 infection and B.1.1.7 variant infection in healthcare workers by antibody and vaccination status	Clinical Infectious Diseases	wrong intervention
Madhi et al.	ChAdOx1 nCoV-19 Vaccine Efficacy against the B.1.351 Variant. Reply	The New England Journal of Medicine	wrong publication type
Madhi et al.	Safety and efficacy of the ChAdOx1 nCoV-19 (AZD1222) Covid-19 vaccine against the B.1.351 variant in South Africa	Preprint - medRxiv	duplicated
Mahase	Covid-19: Pfizer vaccine's efficacy declined from 96% to 84% four months after second dose, company reports	BMJ (Clinical Research Ed.)	wrong publication type
Maneikis et al.	Immunogenicity of the BNT162b2 COVID-19 mRNA vaccine and early clinical outcomes in patients with haematological malignancies in Lithuania: a national prospective cohort study	The Lancet Haematology	wrong intervention
Martinez-Baz et al.	Effectiveness of COVID-19 vaccines in preventing SARS-CoV-2 infection and hospitalisation, Navarre, Spain, January to April 2021	Eurosurveillance	wrong intervention
Martinot et al.	Outbreak of SARS-CoV-2 infection in a long-term care facility after COVID-19 BNT162b2 mRNA vaccination	Clinical Microbiology and Infection	wrong intervention
Massimo et al.	COVID-19 convalescent plasma donors: impact of vaccination on antibody levels, breakthrough infections and reinfection rate	Preprint - medRxiv	wrong intervention
Mateo-Urdiales et al.	Risk of SARS-CoV-2 infection and subsequent hospital admission and death at different time intervals since first dose of COVID-19 vaccine administration, Italy, 27 December 2020 to mid-April 2021	Hand search; Eurosurveillance	wrong intervention
Mateus et al.	Low dose mRNA-1273 COVID-19 vaccine generates durable T cell memory and antibodies enhanced by pre-existing crossreactive T cell memory	Preprint - medRxiv	wrong outcome

Mathema et al.	Post-vaccination SARS-COV-2 among healthcare workers in New Jersey: a genomic epidemiological study	Preprint - medRxiv	wrong intervention
Mattar et al.	Efficacy of the CoronaVac® Vaccine in a Region of the Colombian Amazon, Was Herd Immunity Achieved?	Preprint - Research Square	wrong intervention
Mazagatos et al.	Effectiveness of mRNA COVID-19 vaccines in preventing SARS-CoV-2 infections and COVID-19 hospitalisations and deaths in elderly long-term care facility residents, Spain, weeks 53 2020 to 13 2021	Eurosurveillance	wrong intervention
McConaghy et al.	An assessment of the impact of the vaccination program on coronavirus disease 2019 (COVID-19) outbreaks in care homes in Northern Ireland-A pilot study	Infection Control and Hospital Epidemiology	wrong intervention
McDade et al.	Durability of antibody response to vaccination and surrogate neutralization of emerging variants based on SARS-CoV-2 exposure history	Scientific Reports	wrong intervention
McEllistrem et al.	Introduction of the BNT162b2 vaccine during a COVID-19 nursing home outbreak	American Journal of Infection Control	wrong intervention
Medeiros et al.	Reduced T cell and antibody responses to inactivated coronavirus vaccine among males and individuals above 55 years old	Preprint - medRxiv	wrong intervention
Meggiolaro et al.	Effectiveness of vaccination against symptomatic and asymptomatic SARS-CoV-2 infection: a systematic review and meta-analysis	Preprint - medRxiv	wrong study design
Mehta & Silveira	COVID-19 after two doses of mRNA vaccines in kidney transplant recipients	American Journal of Transplantation	wrong intervention
Menni et al.	Vaccine side-effects and SARS-CoV-2 infection after vaccination in users of the COVID Symptom Study app in the UK: a prospective observational study	The Lancet Infectious Diseases	wrong intervention
Meo et al.	COVID-19 vaccines: Comparison of biological, pharmacological characteristics and adverse effects of Pfizer/BioNTech and Moderna vaccines	European Review for Medical and Pharmacological Sciences	wrong study design
Meylan	Efficacy and safety of BioNTech/Pfizer and Moderna vaccines	Revue Medicale Suisse	wrong publication type
Meylan	Safety and efficacy of the Oxford-AstraZeneca vaccine: Interim analysis of four randomized controlled trials	Revue Medicale Suisse	wrong intervention

Michos et al.	Association of total and neutralizing SARS-CoV-2 spike -receptor binding domain antibodies with epidemiological and clinical characteristics after immunization with the 1st and 2nd doses of the BNT162b2 vaccine	Vaccine	wrong outcome
Miron et al.	Effectiveness of COVID-19 Vaccines BNT162b2 and mRNA-1273 by Days from Vaccination: A Reanalysis of Clinical Trial Data	Preprint - SSRN	wrong intervention
Mizrahi et al.	Correlation of SARS-CoV-2 Breakthrough Infections to Time-from-vaccine; Preliminary Study	Preprint - medRxiv	wrong outcome
Moline et al.	Effectiveness of COVID-19 Vaccines in Preventing Hospitalization Among Adults Aged >=65 Years - COVID-NET, 13 States, February-April 2021	Morbidity and Mortality Weekly Report	wrong intervention
Monge et al.	Direct and Indirect Effectiveness of mRNA Vaccination against Severe Acute Respiratory Syndrome Coronavirus 2 in Long-Term Care Facilities, Spain	Emerging Infectious Diseases	wrong intervention
Mor et al.	BNT162b2 Vaccination efficacy is marginally affected by the SARS-CoV-2 B.1.351 variant in fully vaccinated individuals	Preprint - medRxiv	wrong population
Moustsen Helms et al.	Vaccine effectiveness after 1st and 2nd dose of the BNT162b2 mRNA Covid-19 Vaccine in long-term care facility residents and healthcare workers—a Danish cohort study	Preprint - medRxiv	wrong intervention
Munitz et al.	BNT162b2 vaccination effectively prevents the rapid rise of SARS-CoV-2 variant B.1.1.7 in high-risk populations in Israel	Cell Reports Medicine	wrong intervention
Murillo-Zamora et al.	Effectiveness of BNT162b2 COVID-19 Vaccine in Preventing Severe Symptomatic Infection among Healthcare Workers	Medicina (Kaunas, Lithuania)	wrong intervention
Musser et al.	Delta variants of SARS-CoV-2 cause significantly increased vaccine breakthrough COVID-19 cases in Houston, Texas	Preprint - medRxiv	wrong study design
Naaber et al.	Declined antibody responses to COVID-19 mRNA vaccine within first three months	Preprint - medRxiv	wrong outcome
Nanduri et al.	Effectiveness of Pfizer-BioNTech and Moderna Vaccines in Preventing SARS-CoV-2 Infection Among Nursing Home Residents Before and During Widespread Circulation of the SARS-CoV-2 B.1.617.2 (Delta) Variant - National Healthcare Safety Network, March 1-August 1, 2021	Morbidity and Mortality Weekly Report	wrong study design
Nasreen et al.	Effectiveness of COVID-19 vaccines against variants of concern in Ontario, Canada	Preprint - medRxiv	wrong intervention

Nasreen et al.	Effectiveness of COVID-19 vaccines against variants of concern, Canada	Hand search; Preprint - medRxiv	wrong intervention
Nomura et al.	Age and smoking predict antibody titres at 3 months after the second dose of the BNT162b2 COVID-19 vaccine	Preprint - medRxiv	wrong outcome
Nunes et al.	mRNA vaccines effectiveness against COVID-19 hospitalizations and deaths in older adults: a cohort study based on data-linkage of national health registries in Portugal	Preprint - medRxiv	wrong intervention
Nunez Lopez et al.	Effectiveness of the BNT162b2 mRNA Covid-19 vaccine in Spanish healthcare workers	Enfermedades Infecciosas y Microbiologia Clinica	wrong intervention
Oster et al.	Association Between Exposure Characteristics and the Risk for COVID-19 Infection Among Health Care Workers With and Without BNT162b2 Vaccination	JAMA network open	wrong study design
Paetzold et al.	The effects of rapid mass vaccination against SARS-CoV-2 and its Variants-of-Concern: Evidence from an early VoCs hotspot	Preprint – Research Square	wrong study design
Painter et al.	Rapid induction of antigen-specific CD4+ T cells guides coordinated humoral and cellular immune responses to SARS-CoV-2 mRNA vaccination	Preprint - bioRxiv	wrong outcome
Palich et al.	Weak immunogenicity after a single dose of SARS-CoV-2 mRNA vaccine in treated cancer patients	Annals of Oncology	wrong outcome
Palladino et al.	A quantitative risk-benefit analysis of ChAdOx1 nCoV-19 vaccine among people under 60 in Italy	Preprint - medRxiv	wrong study design
Panasoff et al.	Specific antibody response of patients with common variable immunodeficiency to BNT162b2 coronavirus disease 2019 vaccination	Annals of Allergy, Asthma and Immunology	wrong outcome
Papousek et al.	Experience with the production of COVID-19 convalescent plasma in a tertiary hospital	Vox Sanguinis	wrong outcome
Paris et al.	Effectiveness of mRNA-BNT162b2, mRNA-1273, and ChAdOx1 nCoV-19 vaccines against COVID-19 in healthcare workers: an observational study using surveillance data	Clinical Microbiology and Infection	wrong intervention
Parry et al.	Extended interval BNT162b2 vaccination enhances peak antibody generation in older people	Preprint - medRxiv	wrong outcome

Parry et al.	Antibody responses after first and second Covid-19 vaccination in patients with chronic lymphocytic leukaemia	Blood Cancer Journal	wrong outcome
Parry et al.	Antibody responses after first and second Covid-19 vaccination in patients with chronic lymphocytic leukaemia	Blood cancer Journal	wrong outcome
Paulsen et al.	Immune Thrombocytopenic Purpura after vaccination with COVID-19 Vaccine (ChAdOx1 nCov-19)	Blood	wrong study design
Pawlowski et al.	FDA-authorized mRNA COVID-19 vaccines are effective per real-world evidence synthesized across a multi-state health system	Med (New York, N.Y.)	wrong intervention
Payne et al.	Sustained T cell immunity, protection and boosting using extended dosing intervals of BNT162b2 mRNA vaccine	Hand search; Preprint - SSRN	wrong outcome
Pegu et al.	Durability of mRNA-1273 vaccine-induced antibodies against SARS-CoV-2 variants	Science (New York, N.Y.)	wrong outcome
Peled et al.	BNT162b2 vaccination in heart transplant recipients: Clinical experience and antibody response	Journal of Heart and Lung Transplantation	wrong intervention
Perkmann et al.	Serum antibody response to BNT162b2 after natural SARS-CoV-2 infection	European Journal of Clinical Investigation	wrong outcome
Pilishvili et al.	Interim Estimates of Vaccine Effectiveness of Pfizer-BioNTech and Moderna COVID-19 Vaccines Among Health Care Personnel - 33 U.S. Sites, January-March 2021	Morbidity and Mortality Weekly Report	wrong intervention
Pouwels et al.	Impact of Delta on viral burden and vaccine effectiveness against new SARS-CoV-2 infections in the UK	Preprint - medRxiv	wrong intervention
Pozdnyakova et al.	Decreased Antibody Responses to Ad26.COV2.S Relative to SARS-CoV-2 mRNA Vaccines in Patients with Inflammatory Bowel Disease	Gastroenterology	wrong outcome
Pozzetto et al.	Immunogenicity and efficacy of heterologous ChadOx1/BNT162b2 vaccination	Preprint - Research Square	wrong intervention
Prabhu et al.	Antibody Response to Coronavirus Disease 2019 (COVID-19) Messenger RNA Vaccination in Pregnant Women and Transplacental Passage Into Cord Blood	Obstetrics and Gynecology	wrong intervention
Prasad et al.	COVID-19 Vaccination Associated with Reduced Post-Operative SARS-CoV-2 Infection and Morbidity	Annals of Surgery	wrong intervention

Pratesi et al.	BNT162b2 mRNA SARS-CoV-2 vaccine elicits high avidity and neutralizing antibodies in healthcare workers	Vaccines	wrong outcome
Pratò et al.	SARS-CoV-2 Transmission Risk to Household and Family Contacts by Vaccinated Healthcare Workers	Journal of Occupational and Environmental Medicine	wrong intervention
Prendecki et al.	Comparison of humoral and cellular responses in kidney transplant recipients receiving BNT162b2 and ChAdOx1 SARS-CoV-2 vaccines	Preprint - medRxiv	wrong outcome
Prendecki et al.	Humoral and T-cell responses to SARS-CoV-2 vaccination in patients receiving immunosuppression	Annals of the Rheumatic Diseases	wrong outcome
Pritchard et al.	Impact of vaccination on new SARS-CoV-2 infections in the UK	Nature Medicine	wrong intervention
Prunas et al.	Vaccination with BNT162b2 reduces transmission of SARS-CoV-2 to household contacts in Israel	Preprint - medRxiv	wrong study design
Puranik et al.	Comparison of Two Highly-Effective mRNA Vaccines for COVID-19 During Periods of Alpha and Delta Variant Prevalence	Preprint - medRxiv	duplicated
Ramirez et al.	Correspondence on 'Immunogenicity and safety of anti-SARS-CoV-2 mRNA vaccines in patients with chronic inflammatory conditions and immunosuppressive therapy in a monocentric cohort'	Annals of the Rheumatic Diseases	wrong outcome
Ramirez et al.	SARS-CoV-2 Breakthrough Infections in Fully Vaccinated Individuals	Preprint - medRxiv	wrong outcome
Redjoul et al.	Antibody response after second BNT162b2 dose in allogeneic HSCT recipients	The Lancet	wrong outcome
Redmond et al.	Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in vaccinated and unvaccinated healthcare personnel in a Veterans' Affairs healthcare system	Infection Control and Hospital Epidemiology	wrong intervention
Revon-Riviere et al.	The BNT162b2 mRNA COVID-19 vaccine in adolescents and young adults with cancer: A monocentric experience	European Journal of Cancer	wrong intervention
Roest et al.	BNT162b2 mRNA Covid-19 vaccine in a nationwide mass vaccination setting	New England Journal of Medicine	duplicated

Rosenberg et al.	New COVID-19 Cases and Hospitalizations Among Adults, by Vaccination Status — New York, May 3–July 25, 2021	Hand search; Morbidity and Mortality Weekly Report	wrong intervention
Sabnis et al.	Break-through COVID-19 infection rate with Indian strain in Single-center Healthcare Workers: A real world data	Preprint - medRxiv	wrong outcome
Saciuk et al.	Pfizer-BioNTech Vaccine Effectiveness Against SARS-CoV-2 Infection: Findings From a Large Observational Study in Israel	Hand search; Preprint - SSRN	duplicated
Saciuk et al.	Pfizer-BioNTech Vaccine Effectiveness Against SARS-CoV-2 Infection: Findings From a Large Observational Study in Israel	Preprint - SSRN	wrong intervention
Sacks	The single-dose J&J vaccine had 67% efficacy against moderate to severe-critical COVID-19 at >=14 d	Annals of Internal Medicine	wrong publication type
Sagiraju et al.	The effectiveness of SARS-CoV-2 vaccination in preventing severe illness and death—real-world data from a cohort of patients hospitalized with COVID-19	Preprint - medRxiv	wrong intervention
Sansone et al.	Effectiveness of BNT162b2 vaccine against SARS-CoV-2 among healthcare workers	La Medicina del Lavoro	wrong intervention
Sarkar et al.	Seroprevalence and Dynamics of anti-SARS-CoV-2 antibody among healthcare workers following ChAdOx1 nCoV-19 vaccination	Preprint - medRxiv	wrong intervention
Saul et al.	Reanalysis of the Pfizer mRNA BNT162b2 SARS-CoV-2 vaccine data fails to find any increased efficacy following the boost: Implications for vaccination policy and our understanding of the mode of action	Preprint - medRxiv	wrong intervention
Selby et al.	Effect of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) mRNA vaccination in healthcare workers with high-risk coronavirus disease 2019 (COVID-19) exposure	Infection Control and Hospital Epidemiology	wrong intervention
Shah et al.	Effect of vaccination on transmission of COVID-19: an observational study in healthcare workers and their households	Preprint - medRxiv	wrong intervention
Sheikh et al.	SARS-CoV-2 Delta VOC in Scotland: demographics, risk of hospital admission, and vaccine effectiveness	The Lancet	wrong intervention
Shinde et al.	Efficacy of NVX-CoV2373 Covid-19 Vaccine against the B.1.351 Variant	Hand search; New England Journal of Medicine	wrong intervention

Shostak et al.	Early humoral response among lung transplant recipients vaccinated with BNT162b2 vaccine	The Lancet Respiratory Medicine	wrong intervention
Singer et al.	Effectiveness of BNT162b2 mRNA COVID-19 Vaccine Against SARS-CoV-2 Variant Beta (B.1.351) Among Persons Identified Through Contact Tracing in Israel	Preprint - SSRN	wrong intervention
Singh et al.	Antibody Response after First-dose of ChAdOx1-nCOV (Covishield) and BBV-152 (Covaxin) amongst Health Care Workers in India: Preliminary Results of Cross-sectional Coronavirus Vaccine-induced Antibody Titre (COVAT) study	Preprint - medRxiv	wrong intervention
Skowronski & de Serres	Safety and efficacy of the BNT162B2 mRNA covid-19 vaccine	New England Journal of Medicine	wrong intervention
Stowe et al.	Effectiveness of COVID-19 vaccines against hospital admission with the Delta (B.1.617.2) variant	Hand search; Public Health England pre-prints	wrong intervention
Swift et al.	Effectiveness of mRNA COVID-19 vaccines against SARS-CoV-2 infection in a cohort of healthcare personnel	Clinical Infectious Diseases	wrong intervention
Tahor et al.	Evidence for increased breakthrough rates of SARS-CoV-2 variants of concern in BNT162b2-mRNA-vaccinated individuals	Nature Medicine	duplicated
Tande et al.	Impact of the COVID-19 Vaccine on Asymptomatic Infection Among Patients Undergoing Pre-Procedural COVID-19 Molecular Screening	Clinical Infectious Diseases	wrong intervention
Tande et al.	mRNA Vaccine Effectiveness Against Asymptomatic SARS-CoV-2 Infection Over a Seven-Month Period	Infection Control and Hospital Epidemiology	wrong study design
Tang et al.	Asymptomatic and Symptomatic SARS-CoV-2 Infections after BNT162b2 Vaccination in a Routinely Screened Workforce	JAMA - Journal of the American Medical Association	wrong intervention
Tang et al.	BNT162b2 and mRNA-1273 COVID-19 vaccine effectiveness against the Delta (B.1.617.2) variant in Qatar	Preprint - medRxiv	wrong study design
Tanislav et al.	Effect of SARS-CoV-2 vaccination among health care workers in a geriatric care unit after a B.1.1.7-variant outbreak	Public Health	wrong intervention

Taubel et al.	Can a second booster dose be delayed in patients who have had COVID-19?	Preprint - medRxiv	wrong outcome
Tene et al.	Assessment of effectiveness of 1 dose of BNT162B2 vaccine for SARS-CoV-2 infection 13 to 24 days after immunization	JAMA network open	wrong intervention
Tene et al.	The effectiveness of the TWO-DOSE BNT162b2 vaccine: analysis of real-world data	Clinical Infectious Diseases	wrong intervention
Tenforde et al	Effectiveness of SARS-CoV-2 mRNA Vaccines for Preventing Covid-19 Hospitalizations in the United States	Clinical Infectious Diseases	wrong study design
Tenforde et al.	Effectiveness of Pfizer-BioNTech and Moderna Vaccines Against COVID-19 Among Hospitalized Adults Aged >=65 Years - United States, January-March 2021	Morbidity and Mortality Weekly Report	wrong intervention
Thangaraj et al.	Predominance of delta variant among the COVID-19 vaccinated and unvaccinated individuals, India, May 2021	The Journal of Infection	wrong outcome
Thiruvengadam et al.	Cellular Immune Responses are Preserved and May Contribute to Chadox1 ChAdOx1 nCoV-19 Vaccine Effectiveness Against Infection Due to SARS-CoV-2 B.1.617.2 Delta Variant Despite Reduced Virus Neutralisation	Preprint - SSRN	wrong intervention
Thompson et al.	Interim Estimates of Vaccine Effectiveness of BNT162b2 and mRNA-1273 COVID-19 Vaccines in Preventing SARS-CoV-2 Infection Among Health Care Personnel, First Responders, and Other Essential and Frontline Workers - Eight U.S. Locations, December 2020-March 2021	Morbidity and Mortality Weekly Report	wrong intervention
Thompson et al.	Prevention and Attenuation of Covid-19 with the BNT162b2 and mRNA-1273 Vaccines	New England Journal of Medicine	wrong intervention
Toback et al.	Safety, Immunogenicity, and Efficacy of a COVID-19 Vaccine (NVX-CoV2373) Co-administered With Seasonal Influenza Vaccines	Preprint - medRxiv	wrong intervention
Toniasso et al.	Reduction in COVID-19 prevalence in healthcare workers in a university hospital in southern Brazil after the start of vaccination	International Journal of Infectious Diseases: IJID	wrong intervention
Trapani et al.	COVID-19 vaccines in patients with cancer	The Lancet Oncology	wrong publication type

Tré-Hardy et al.	Waning antibodies in SARS-CoV-2 naïve vaccines: Results of a three-month interim analysis of ongoing immunogenicity and efficacy surveillance of the mRNA-1273 vaccine in healthcare workers	The Journal of Infection	wrong intervention
Tsapepas et al.	Clinically Significant COVID-19 Following SARS-CoV-2 Vaccination in Kidney Transplant Recipients	American Journal of Kidney Diseases	wrong outcome
Tsiatis et al.	Estimating vaccine efficacy over time after a randomized study is unblinded	Biometrics	wrong study design
Tyagi et al.	Breakthrough COVID19 infections after vaccinations in healthcare and other workers in a chronic care medical facility in New Delhi, India	Diabetes & Metabolic Syndrome	wrong outcome
Vahidy et al.	Real World Effectiveness of COVID-19 mRNA Vaccines against Hospitalizations and Deaths in the United States	Preprint - medRxiv	article withdrawn
Vaishya et al.	SARS-CoV-2 infection after COVID-19 immunization in healthcare workers: A retrospective, pilot study	The Indian Journal of Medical Research	NO PDF
Vasileiou et al.	Interim findings from first-dose mass COVID-19 vaccination roll-out and COVID-19 hospital admissions in Scotland: a national prospective cohort study	The Lancet	wrong intervention
Vasileiou et al.	Effectiveness of First Dose of COVID-19 Vaccines Against Hospital Admissions in Scotland: National Prospective Cohort Study of 5.4 Million People	Hand search; Preprint - SSRN	wrong intervention
Vergnes	Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine	The New England Journal of Medicine	wrong intervention
Victor et al.	Protective Effect of COVID-19 Vaccine Among Health Care Workers During the Second Wave of the Pandemic in India	Mayo Clinic proceedings	wrong intervention
Victora et al.	Estimating the early impact of vaccination against COVID-19 on deaths among elderly people in Brazil: Analyses of routinely-collected data on vaccine coverage and mortality	EClinicalMedicine	wrong study design
Vijayasingham et al.	Sex-disaggregated data in COVID-19 vaccine trials	The Lancet	wrong study design
Voysey et al.	Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK	The Lancet	wrong intervention

Voysey et al.	Single-dose administration and the influence of the timing of the booster dose on immunogenicity and efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine: a pooled analysis of four randomised trials	The Lancet	wrong intervention
Wadei et al.	COVID-19 infection in solid organ transplant recipients after SARS-CoV-2 vaccination	American Journal of Transplantation	wrong intervention
Wagner et al.	COVID-19 vaccine: mRNA-1273 is effective and safe	Pneumologie	foreign language
Wang	Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine	The New England Journal of Medicine	wrong intervention
Wang et al.	The impacts of COVID-19 vaccine timing, number of doses, and risk prioritization on mortality in the US	Preprint - medRxiv	wrong study design
Westholter & Taube	SARS-CoV-2 outbreak in a long-term care facility after vaccination with BNT162b2	Clinical Infectious Diseases	wrong intervention
Whitaker et al.	Pfizer-BioNTech and Oxford AstraZeneca COVID-19 vaccine effectiveness and immune response among individuals in clinical risk groups	Hand search - Public Health England preprints	wrong intervention
White et al.	Incident SARS-CoV-2 Infection among mRNA-Vaccinated and Unvaccinated Nursing Home Residents	The New England Journal of Medicine	wrong intervention
Wickert et al.	Estimates of Single Dose and Full Dose BNT162b2 Vaccine Effectiveness among USAF Academy cadets, 1 Mar - 1 May 2021	Preprint - medRxiv	wrong intervention
Williams et al.	Measuring vaccine efficacy against infection and disease in clinical trials: sources and magnitude of bias in COVID-19 vaccine efficacy estimates	Preprint - medRxiv	wrong intervention
Williams et al.	COVID-19 Outbreak Associated with a SARS-CoV-2 P.1 Lineage in a Long-Term Care Home after Implementation of a Vaccination Program – Ontario, April-May 2021	Hand search; Clinical Infectious Diseases	wrong intervention
Wise	Covid-19: New data on Oxford AstraZeneca vaccine backs 12 week dosing interval	BMJ (Clinical Research Ed.)	wrong publication type
Wise	Covid-19: People who have had infection might only need one dose of mRNA vaccine	BMJ (Clinical Research Ed.)	wrong publication type
Wise	Covid-19: People who have had infection might only need one dose of mRNA vaccine	BMJ (Clinical Research Ed.)	duplicated

Wise	Covid-19: Pfizer BioNTech vaccine reduced cases by 94% in Israel, shows peer reviewed study	BMJ (Clinical Research Ed.)	wrong publication type
Xiong et al.	Age and Gender Disparities in Adverse Events Following COVID-19 Vaccination: Real-World Evidence Based on Big Data for Risk Management	Frontiers in Medicine	wrong intervention
Yadav et al.	The high mortality and impact of vaccination on COVID-19 in hemodialysis population in India during the second wave	Kidney International Reports	wrong intervention
Yan et al.	Rate and risk factors for breakthrough SARS-CoV-2 infection after vaccination	Journal of Infection	wrong intervention
Yassi et al.	Infection control, occupational and public health measures including mRNA-based vaccination against SARS-CoV-2 infections to protect healthcare workers from variants of concern: a 14-month observational study using surveillance data	Preprint - medRxiv	wrong intervention
Yelin et al.	Associations of the BNT162b2 COVID-19 vaccine effectiveness with patient age and comorbidities	Preprint - medRxiv	wrong intervention
Young Xu et al.	Coverage and Effectiveness of mRNA COVID-19 Vaccines among Veterans	Preprint - medRxiv	wrong intervention
Zacay et al.	BNT162b2 Vaccine Effectiveness in Preventing Asymptomatic Infection With SARS-CoV-2 Virus: A Nationwide Historical Cohort Study	Open Forum Infectious Diseases	wrong intervention
Zaqout et al.	The initial impact of a national BNT162b2 mRNA COVID-19 vaccine rollout	International Journal of Infectious Diseases: IJID	wrong intervention

Team members' individual reflections on intersectionality and positionality

1. **What are elements about our background that influence how we go about interacting with research? What perspectives do we have and what perspectives are we missing?**

"I have training in epidemiology and public health, and a clinical background in pharmacy. I believe my background may lead me to favour statistical/quantitative evidence and weigh heavily quantitative reviews that focus on clinical outcomes like deaths, cases, and hospitalizations."

"I have spent about 8 years living in high-income countries, and my experience as an immigrant has certainly created a 'path' for me to be particularly sensitive and cognisant of the representation of disadvantaged communities in research. In this specific project for instance, I believe that I was more motivated to identify where the data is coming from (i.e., evidence from which context is lacking), and that I had questions around implementation issues at the back of my mind (e.g., what happens in rich countries vs. poorer countries; infrastructure issues in various settings and their ability to effectively track pandemic cases/deaths, and adopt additional preventive measures that might have economic and other implications for citizens)."

"Having participated in research projects in university with several scientists in different fields, I believe most people working in research are trying their best to produce good studies. As I live with several chronic diseases, however, I have seen little research done on most of those chronic diseases found primarily in women, and this made me wary of the willingness of the general research system to address important health issues as is needed."

"A background in physics and in social sciences, where I studied science as an object of research, led me to focus on the human aspect of the conduct of research and on the difficulties encountered by several individuals with data literacy, even with educated people. My other background in information science and the position I occupy as a research support librarian for several years push me to favor the importance of a good methodology in knowledge synthesis."

"As a person working in research for more than 20 years (in training + professional experience), I have a strong drive to analyze the quality of evidence, since my expertise is evidence analysis and synthesis. I am confident that methodologically we developed a strong report, which doesn't mean we answered all questions – we presented some that cannot be answered at this point as well."

"I have university-level education and regularly work on editing/reviewing research-related texts. This has made my interaction with research very analytical in terms of its language (e.g., lexical, structural) which makes my perspective at once very detail oriented (e.g., word choice, grammar) and overarching (e.g., messaging, clarity, implications)."

"My training and personality lead me to a more quantitative approach when developing research. Numbers seem to provide me with a better sense of results that are easier for me to interpret. My background (mainly training and learning opportunities) and the privileges provided by my positionality also lead me to a perspective of questioning information and reality. It also gave me resources and chances to learn and argue. As a latin woman, the distrust is part of who I am, although my life experiences give me an optimistic point of view."

“Growing up in a community and family with little or no university experience allows me to understand the extent to which the work of health research is exclusive and restricted to a relatively small (and generally, though not always, privileged) population. Health research has historically struggled to build bridges to and from patient populations and has also struggled to effectively share its processes, objectives, and findings (including their implications and limitations) with the public at large, from individuals to decision-makers not directly invested/involved with health research.”

“As a recent university undergraduate, surrounded by a younger generation with generally liberal worldviews, a visible minority, and having had training in Equity, Diversity and Inclusion (EDI), I am always curious about the practical implications of our research for marginalised population (e.g., how our messaging about vaccines can affect populations historically skeptical of vaccines). Being a relatively blank slate to how research is traditionally done at our lab also made me open to integrating intersectionality to our processes.”

“As a Brazilian, my country has been facing challenges in accessing vaccines, so part of the missing piece is to realize that our results reflect the scenario in high-income countries, and maybe that the efficacy results do not reflect the reality where VOCs are not well managed/contained and spread more rapidly. The available data did not allow us to explore these different perspectives.”

“I have been trained across multiple disciplines (ranging from Chemistry through to behavioural science, with stops at physiology, biochemistry, biomechanics, psychophysiology, cardiology, pneumology, nuclear medicine, etc.), which gives me a broad perspective on research and research methodology. However, this has always been in the context of high-income countries and in universities that are generally considered to have high standings and better-quality facilities and capacity. Collectively, the team has a broad range of skills and backgrounds which cover varied fields (e.g., epidemiology, social psychology, physiotherapy) and jobs (e.g., academics, students, librarian, food science specialist) which brings research training that spans the spectrum of research studies.”

“I am a first-generation scholar that grew up in an impoverished and unstable family environment. When I went to university, I was often aware of how my background contrasted with that of others around me, and it often seemed like people were living in different realities from one another. Throughout my career, I have often gravitated towards interacting more with others who have less traditional/represented backgrounds in their work environments, and this has given me an appreciation for the degree to which people’s personal experiences and backgrounds influence their views and their work”

“My unusually rare neurological condition has brought me to become more familiar with the field of health research as a patient and as someone seeking insight from an extremely limited pool of data. My condition also often renders many of my healthcare experiences, questions and care needs as ‘statistically insignificant’ or ‘idiosyncratic’ which raises questions for me about inclusivity and the applicability of generalizing findings across all types of populations, notably in a context where healthcare professionals do not have time for personalized medicine or care.”

“Throughout my life, I have had access to higher education and have had an ‘average’ positioning in society (i.e., I would perceive myself somewhere in the middle in terms of socioeconomic status). However, I come from a middle-income country and most of my teenage years I have lived in an environment with a challenging political situation, including sanctions and war.”

“I am a social psychologist, with a dominant orientation towards theory and quantitative methodology, but have also received education/exposure to several other disciplines (e.g., sociology, communications, health, philosophy, history). I have had long-standing interests in methods, metascience (the study of how scientists go about doing and thinking about research), intergroup relations, and cross-cultural research, and these explorations have led me to be weary of ‘gold standards’ and ‘agreed upon rules’ in science; I believe dominant methodologies (and theories) always come with important biases and assumptions that lead to (often unrecognized) trade-offs, and can often risk reinforcing social inequities when applied without care.”

2. **What are elements about our background that influence how we interact with the topic of vaccines, and policies for vaccination more generally? What perspectives do we have and what perspectives are we missing?**

“I am politically quite liberal and believe that policy-based changes are an essential part of improving society. My research training has also led me to take a very ‘interventionist-centric’ viewpoint.”

“I generally operate in a consequentialist but also collectivist mindset. Part of this comes from growing up in an environment where individual welfare is expected to be set aside in favour of the collective.”

“My study background makes me sceptical of the autonomy of research conduct in vaccines considering all the money interests of the pharmaceutical business, but I still believe in the integrity of the academic researchers. When I was young I remember having reacted adversely to the whooping cough vaccine. Throughout my youth until 21 years old, I had several allergies to elements of my environment that left me without energy and with symptoms of discomfort to the point of wishing I were dead. Fifteen years ago, I had a bad experience with a medication that took me a year to recover from. In short, I'm hesitant with anything that bypasses my immune system, like the vaccination for myself. Because of my susceptibility, I did not vaccinate my children when they were babies (but I did follow other recommendations of Santé Canada that few families do, like breastfeeding their children for at least two years).”

“I think most social and health policies, although frequently well-intentioned, come with side effects and biases that can disadvantage some groups over others. I also think the values, experiences, and needs of different groups can leave them to define ‘success’ very differently. Consequently, my default is to adopt a more skeptical stance on policies.”

“I am a behaviouralist, so my perspective on vaccines and vaccine policies is predominantly from the angle of are people getting them or not, why, and if not, how do we go about creating the environment where they are more likely to get the vaccine. This is based on the assumption that the evidence supports the use of vaccines, for which there is strong evidence for in the current pandemic. The two aspects that we are potentially missing are those of a 'front-line' policy maker and an immunologist, though given the topic area the immunologist is less critical, but they may be able to provide some perspective on the potential immunological aspects of waning.”

“Regarding recent discussions on policy-related recommendations, I would say that I tend to be in favour of mandates, which upon reflection might in part be related to the socio-political contexts I grew up in.”

“I come from a pro-science family with several doctors and nurses. My brother had mumps as a kid before the vaccine was available and this resulted in permanent damage to his ears. That made me generally favorably inclined toward vaccination.”

“The missing point here is clearly the perspective of access, and how the vaccines would perform in scenarios where vaccination does not advance as fast.”

“I am pro vaccination – I would say that my beliefs were shaped by my family background (3 out of my 4 closest family members are physicians), my personal educational training and both my current and previous work environments (engaged in promoting vaccination).”

“The neurological condition I live with is immune-mediated and, owing to its onset being associated with vaccination (in some cases, but not all), my approach to understanding, parsing, and making informed decisions about vaccination are complicated by the inevitable lack of specific health-population data relevant to my condition. Though I am able to make the distinctions between what is well-advised for the greater good and for policymakers, I am also keenly aware of the far-from-abstract realities of wrestling with being that ‘1 in 100,000’ exceptional case.”

“On the topic of vaccines, I have previously done research and advocacy on vaccination that has led me to develop a generally positive attitude. However, I also think individuals and groups need to be given a fair chance to make informed and self-determined decisions for themselves.”

“As a physiotherapist, really interested in physiological aspects and little training in immunogenicity, but also as a behavioural scientist, I see vaccines with the complexity it requires. I am concerned about safety aspects, efficacy, and long-term impact in health. Accessibility and the impact across different population profiles are also important aspects. However, regarding specifically the vaccines against COVID-19, I honestly have the tendency to be very optimistic. The pandemic itself, from the health protective measures to vaccines, started to be a political discussion in several countries. So, because of my political position and beliefs, I have the tendency to argue in favour of vaccines and in favour of health measures. The fact that I am part of a COVID-19 project also impacts my perspective, having the opportunity to discuss its impacts in society and people’s behaviours and attitudes. I strongly believe and defend scientific/evidence-based decisions.”

“Growing up, having a mom that is an immunologist among a family of health-related scientists, I always trusted vaccines and followed governmental mandates on that. Also, Brazil has one of the most extensive vaccination public programs and a population that presents very little hesitancy. I can easily place myself as a pro-vax person but did not miss the opportunity to really go deep in the evidence before accepting my doses. I think hesitancy and policies were not directly related to our report topic but probably had some impact on the efficacy results, especially the ones based on Israel – high efficacy in a low hesitant population.”

3. **What are elements about our background that influence how we communicate with others? What perspectives do we have and what perspectives are we missing?**

“I work directly with people with different levels of training and familiarity in pretty diverse content. I think as in general research practices we want to get a different perspective and approach the topic as best as we are able to. That said, I believe the team tried their best to incorporate perspectives and hear from all members throughout the process.”

“I have a background doing advocacy work for minority groups and for those without citizenship rights. I also have a background doing tutoring for struggling students, and have spent a good amount of time creating educational materials for teens. Consequently, I greatly value accessibility in writing and trying to take the perspective of one’s audience into account.”

“Considering I have training in academic writing and have also read some materials about it, I tend to write in the easiest way. I mostly use active voice and try to be impartial while reporting results. I try to avoid including any personal perspectives when writing reports or manuscripts. Also, following a logical organisation is also important to me, that is to have the different sections in the same order of topics and in agreement. Synthesis, however, is not a skill that I have developed much; I usually tend to over-write. As a non-native English speaker, writing and communication in this language might be impacted, e.g., not choosing the best words for each context. Despite this, the fact that I was raised surrounded by people with non-academic training, gave me skills on how we communicate outside academia. Overall, I have been learning a lot about communication skills, e.g., nonviolent communication and academic communication, such as expressing my perspectives only when it is appropriate and non-judgmental.”

“I hold more collectivistic values, which may lead me to emphasize implications for collective groups of individuals.”

“I am an immigrant twice over, so I have some understanding of how, as you transition from one culture to another, that not everything you say 'translates' well, so I try to be as clear and jargon free as possible (though a lot of times I don't succeed). That being said, I have immigrated into countries that are more alike than different culturally. I am also generally optimistic about research and collaborations in research, which normally translates to a more upbeat communication style. More broadly, we have a diverse team, in terms of country of birth. However, all of us are from generally higher income countries and we all currently live in a high-income country and in a particular setting within that country. Given that we included global data, none which came from Canada or Quebec, we were missing a broader international perspective in the interpretation of the data.”

“When I was a stay-at-home mother, I had a past experience with community work and some activism. I think that it led me to emphasize that any kind of citizen has access to uncensored information.”

“I am a big proponent of methods to make science more open and accessible. Whenever I lead a new project, I always try to incorporate components that are publicly available (e.g., public access data) and wish I could spend more time developing accessible knowledge translation materials.”

“Having grown up and lived most of my life within a generally undereducated community, I learned how education can be isolating and that this can cut both ways. I became isolated from my community the more I pursued my education, and the community was isolated from what I was learning, both structurally and culturally. By this I mean that there is pushback in relation to what is perceived as opaque knowledge-generation, knowledge access and sharing, and how knowledge is communicated, and even made relevant. Plain language became the bridge between me and my community and has also become an asset professionally. ‘Why does this matter?’ and ‘What does that mean?’ and ‘Explain it so I can understand’ are important anchors to keep front of mind. Demonstrating mastery of any common or emerging knowledge must inevitably be filtered into plain language in order to raise its credibility and shareability.”

“I grew up in a country with a very vertical type of communication in all aspects of society. Living in Quebec now has allowed me to get used to a more horizontal form of communication but probably not as much as most Canadians. Working with people with very different backgrounds (including immigrants, people of all ages, people that can barely read/write…) has shown me that a message should be adapted to the intended public to be understood.”

“My educational training may have led me to have constraints and avoid in particular framing messages in such a way that the final audience can perceive as ‘vaccines are bad’ or ‘we are not sure of the value of vaccines’.”

“I often have an intervention mindset in my communication. This can lead me to interpret knowledge translation as being intervention work and ask myself, ‘how can this sentence and image be altered to positively influence people’s beliefs and behaviours?’. This can have benefits to encourage healthier decision making, but if my values/beliefs are misguided, it could also be detrimental. This is something I try to be aware of, and I sometimes take a step back to instead ask ‘how can I create this message to help people understand the topic and make a decision for themselves?’”

4. **How have the dynamic within the team and the context of this project influenced the above themes?**

“Only interacted directly with the team on one occasion, but could see the formidable challenge of bridging the gap between hard findings and what can be derived from (and credibly said about) them.”

“I felt the team had good communication and dynamics, which had a positive effect on the development of this project. The time available to discuss, however, might have limited the amount of contributions each member was able to give, but the focus on the important aspects was important and when further discussion was needed, we had an open channel to do it. From a learning perspective, I feel that the time restriction has also impacted the opportunity to expand knowledge. Each member was able to cover only what they were trained on, which I understand in the context of an urgent request and the necessity to keep a high quality of work.”

“I think that even with the lack of time, when working through this report, the team has had numerous opportunities to touch base on specific tasks/doubts. I was more or less engaged throughout the entire process. Everyone had their say and after thorough discussion a consensus approach was adopted on the research side of things.”

“The team was very inclusive and comments were accepted from everyone. This allowed us to overcome differences in opinion during discussions.”

“I do believe that time constraints the team was working under may have precluded us from being able to consider/explore as many perspectives as we would have liked.”

“I think the dynamic of the team was very good in allowing for people to speak their mind and be active participants in discussions. I appreciated efforts going into knowledge translation and the team’s open-mindedness towards engaging in discussions on intersectionality. However, for myself, I also occasionally worried about being a ‘trespasser’ in this space (i.e., not having expertise on vaccine effectiveness research), which occasionally made me more reluctant to contribute certain thoughts/concerns.”

“I think the time constraints—deadlines and COVID-related—were something that greatly limited the way we structured our work. Incorporating different perspectives and interpreting these results with more time would probably allow us to incorporate different elements that are not there yet, such as perspectives of ethnicity, access, sex, gender, etc.”

“I am concerned about how time pressures made it so that we cut certain discussions short, and worry about the impacts of ‘rushing’ through certain elements. This felt necessary given the time constraints on this rapid review, but I can’t help but wonder about what we could have done differently if we had more time to complete the review.”

“I think we have had a good dynamic; it has felt as if everyone has contributed to the process and helped shape the final products. I think the short timeline for turnaround has not enabled us to be able to fully exploit the data and the surrounding influences, e.g., the variant situation in the countries at the time of data capture. It also feels like this is the start of the data capture and that over the coming 6-12 months we are going to get a much clearer picture of how VE evolves with the publication of more studies.”

“My relative inexperience in the team and to the process of rapid reviews led me to spend more time trying to keep up with the scientific processes rather than thinking more broadly about intersectionality. I think if I had more experience in the group, I would be more enthusiastic to combat those time constraints that ultimately prevented us from weaving intersectionality reflections into every part of our research.”

“I am a trainee in the team, but my general perception is that I am always given the opportunity to express my opinions and thoughts within this research team.”

“The team was very inclusive in its communication and open-minded so several points of view could be expressed; I didn't feel any ideological rigidity from anybody. We had a common understanding of the constraints to deal with and of the goal to achieve. These dynamics helped us pool our strengths and not split on our differences.”