

Prevalence and severe outcomes from COVID-19 among immigrant and minority ethnic groups and among groups of different socio-economic status

Protocol for a systematic review

Summary

The current COVID-19 pandemic is affecting the whole world, including the population of Norway. However, there have been reports about certain groups of the population, like some minority ethnic groups being overrepresented on some of the statistics on prevalence of COVID-19 and severe outcomes.

We will summarise available research from Norway and countries with similar welfare system on prevalence of COVID-19 infection, rate of admission to hospital and poor prognosis during the COVID-19 pandemic. We will assess the reported outcomes for minority ethnic groups and we will assess the reported outcomes for people with different socio-economic status.

We will conduct a systematic review according to the standards of the Norwegian Institute of Public Health handbook for systematic reviews.

Title: Prevalence and severe outcomes from COVID-19 among immigrant and minority ethnic groups and among groups of different socio-economic status

Protocol for a systematic review

Commissioner:

Thor Indseth, Health Services Research, NIPH

Ellen Furuseth, Vaccine preventable diseases, NIPH

Start date: 26102020

End date: 15012021

Team:

Gunn Elisabeth Vist (team leader)

Eva Helene Arentz-Hansen

Liv Giske

Ragnhild Anne Caroline Storstein Spilker

Tord Finne Vedøy

Elisabet Vivianne Hafstad (information specialist)

Peer reviewers:

Kjetil Gundro Brurberg, NIPH

Liv Merete Reinart, NIPH

Else Karin Grøholt, NIPH

Allan Krasnik, UiCopenhagen, Denmark

Approved by:

"[Name, Department Director, NIPH]"

"[Name, Specialist Director, NIPH]"

Objectives

The objectives of this systematic review are to identify studies from Scandinavia and other countries with similar welfare system, assess and systematically summarize evidence about minority ethnic groups and populations with different socio-economic status on the

- Prevalence of COVID-19 in these populations
- Severity of the disease (COVID-19) in these populations

Background

Background on immigrant and minority ethnic groups and socio-economic status relating to the current COVID-19 pandemic

Consecutively published data from national registers in Norway show a higher prevalence of detected cases of COVID-19 infection among several/ some immigrant groups and there is also an overrepresentation of immigrants among patients hospitalized due to this disease. Similar data has been reported from several European countries including our neighboring countries Sweden and Denmark as well as from the UK (Lager et al 2020, Slot et al 2020, Public Health England 2020)

In Norway nearly 800.000 persons or 14.7% of the population are immigrants and 3.8% are Norwegian born to immigrant parents. 238 281 or more than 25% of immigrants in Norway are refugees (Statistics Norway 2020).

Refugee families often live in difficult conditions with poor economy, crowded housing, labour uncertainty and lack of social networks which could increase their susceptibility to infection exposure and in general make them more vulnerable to the consequences of the pandemic (NKVTS 2020). Labor-immigrants are exposed to similar difficulties (Vrålstad & Wiggen 2017, SSB 2020a, SSB 2020b).

There is different use of concepts in different countries when referring to immigrant or minority ethnic groups. In Norway the most common terms are immigrants and Norwegian born to immigrant parents which is the terminology used by Statistics Norway and defined as “Persons born abroad of two foreign-born parents and four foreign-born grandparents”(Statistics Norway 2020b). This is the most commonly used term in both academic and public discourse and also indicates that we are not referring to our indigenous population, the Saami people, or the Kvens a minority ethnic group that started to migrate to Norway (Finish origin) as early as the 15th century.

In other countries the term minority ethnic groups are more commonly used as a concept in research and data collection. The term BAME (Black and Asian minority groups) is for example used by Public Health England and encompasses both recently arrived immigrants and English born persons of African, Caribbean or Asian background). Whereas in the USA, the term race is commonly used.

Some countries use country of birth (and country of birth of parents) as proxy for ethnic minority, others use self-identified ethnicity or race.

Socio-economic status (SES), or socio-economic position (SEP), is related to many different health outcomes, including non-communicable diseases, chronic diseases, infectious diseases, and mortality (Dalstra et al 2005, Folkehelseinstituttet 2018, Gallo et al 2012, Kivimäki et al 2020; Mackenbach et al 2016). Structural factors associated with social inequality may enable or hamper a society's response to an epidemic. For example, in a study by Elgar et al., social trust, a mark of societies with low(er) social inequality, was related to lower COVID-19 mortality. "The results indicate that societies that are more economically unequal and lack capacity in some dimensions of social capital experienced more COVID-19 deaths" (Elgar et al 2020). Another example may be the role sick leave can have on the spread of COVID-19 as sick leave is more common and more accessible in countries with lower income/wealth inequality.

Most often, socio-economic position is measured by an individual's education, occupation (or labour market participation) or income. However, different measures of socio-economic position affect different health outcomes through different mechanisms. If there is political interest and will to close or minimize the gap in morbidity and mortality between socio-economic groups, the mechanism producing inequality must be described.

Education is the most common measure of SES in health research and, if other measures are omitted, function as a proxy for SES. In itself, education is a measure of knowledge and information processing ability, the idea is that education is not only a set of facts and procedures, but also a set of behaviours and social relations that may affect health related actions and behaviours later in life. For example, smoking is less common among people with university education, even after controlling for work and income, and even among students of subjects that do not concern themselves with the biological or chemical causes of disease (e.g. sociology). One explanation is that by taking part in an institution of higher learning, students acquire certain ideas about whether smoking is an acceptable/desirable behaviour or not. To some degree, education also measure family background and other forms of social capital

In contrast, income measure material resources that may both promote and hinder healthy life choices, for example access to health care or products and services that increase health or help avoid loss of health. Lastly, occupation measure exposure to working conditions that may affect health, but may, in certain contexts, also provide access to (affordable) health care and social resources that promote health.

It is likely that both likelihood of becoming infected by COVID-19 and the severity of the infection is related to SES. However, to effectively address a possible SES gap in COVID-19, it is necessary to assess to what degree differences are related to individual factors such as knowledge and risk perception related to COVID-19 or structural factors such as social and economic resources or work situation.

An earlier rapid review from the Norwegian Institute of Public Health (NIPH) reported on associations between increased severity of COVID-19 disease, and infection rates in populations postulated to be socially or economic vulnerable (Lauvrak & Juvet 2020).

The literature search of Lauvrak & Juvet 2020 was from May 2020 and they included 32 primary studies from where only one Swedish study represented Scandinavia.

Another recently published rapid review from NIPH reported on which patient groups are most at risk of severe outcomes due to COVID-19 infection (Himmels et 2020). Himmels et al 2020 concluded that the elderly are the main group at risk of hospital admission, severe illness, and death if infected by COVID-19. Further, that most comorbidities appeared to increase the risk, and that an increasing number and severity of comorbidities contributed to further increase in the overall risk. Himmels et al 2020 note that male sex, obesity, non-white ethnicity and deprivation were associated with increased risk. One of those studies were Danish.

Inclusion of studies from countries that may have transferable results

Our immediate goal with this systematic review is to inform health care decision makers of Norway, hence our primary analysis will include studies conducted in Norway and other similar Nordic welfare states: Denmark, Finland, Iceland and Sweden (Esping-Andersen 1990).

Acknowledging that this strategy may result in very little information, we plan to expand the scope to also include additional studies from countries with welfare systems closely resembling the Nordic model: Austria, Belgium, the Netherlands and New Zealand (Eikemo & Bamba 2008).

The third layer will be further expanded to also include presentation of studies from countries with welfare systems with some features resembling the Nordic model: Australia, Germany, Great Britain and Ireland (Scruggs & Allen 2008).

Why is it important to do this systematic review?

This systematic review will systematically present information on the prevalence of COVID-19 and severity of the disease in populations of immigrant and minority ethnic status and populations with different socio-economic status. Hence this systematic review may provide:

- A better evidence base for targeted and reinforced measures to fight COVID-19 based on knowledge from comparable settings/ countries
- Knowledge/ information to better identify vulnerable socio-economic and minority ethnic groups
- A better understanding of independent social factors influencing prevalence, morbidity and mortality of COVID-19
- Important information when designing a strategy for vaccination against COVID-19
- Useful information when designing communication strategies and other interventions to help fight the COVID-19 pandemic

Aims

The aims of this systematic review are twofold. We will select studies including minority ethnic groups and populations of different socio-economic status. We will assess and systematically summarize evidence on

- Prevalence of COVID-19 in these populations
- Severity of the disease (COVID-19) in these populations

Methods

This protocol is for a systematic review with planned meta-analysis if appropriate, i.e. enough similar studies and outcomes are available. Our scope is primarily studies with relevance for the Norwegian context. We plan to conduct analysis by geographic origin, and will only pool results from countries where we consider results may be applicable and transferable to a Norwegian setting. Hence, in this systematic review we will primarily include and analyse studies conducted in Norway, Denmark, Finland, Iceland and Sweden. Studies conducted in Austria, Belgium, the Netherlands and New Zealand will be included in secondary analysis. We will restrict risk of bias assessment and meta-analysis to the above mentioned studies.

Study results from the following countries will be briefly presented: Australia, Germany, Great Britain and Ireland. Studies from other countries and continents will be excluded.

If more than 15 studies qualify for analysis, we will consider only including studies with 100 participants or more.

The problem, condition or issue

The aims of this systematic review are to identify studies from Scandinavia and other countries with similar welfare system, assess and systematically summarize evidence about minority ethnic groups and populations with different socio-economic status on the

- Prevalence of COVID-19 in these populations
- Severity of the disease (COVID-19) in these populations

Inclusion criteria

Population:	Minority ethnic groups Populations with different socio-economic status People living in deprived areas
Exposure:	The COVID-19 pandemic
Comparison:	No limitations

Outcome:	Prevalence of COVID-19 Admission to hospital for COVID-19 Admission to intensive care unit for COVID-19 Need for use of ventilator for COVID-19 Mortality for COVID-19
Study design	Systematic reviews (reviews including literature search, clear inclusion criteria and risk of bias assessment of included studies) Primary studies that assess the prevalence and/ or severity of illness of COVID-19 in minority ethnic populations and populations with different socio-economic status
Setting	Our primary analysis will include studies conducted in Norway and other similar Nordic welfare states: Denmark, Finland, Iceland and Sweden Secondary analysis will also include studies from countries with welfare systems closely resembling the Nordic model: Austria, Belgium, the Netherlands and New Zealand Additionally, we will very briefly present studies from countries with welfare systems with some features resembling the Nordic model: Australia, Germany, Great Britain and Ireland
Publication year	2020
Language	Danish, English, Norwegian and Swedish

Exclusion criteria

- We will not include rapid reviews, but will screen their reference lists for potential relevant studies.
- Groups other than those specifically mentioned above
- First nations and indigenous populations

Search strategy

We will search the EndNote database used to populate the NIPH systematic and living map on COVID-19 evidence to identify relevant research on immigrant- and socio-economic status in relation to prevalence and severe outcomes of COVID-19. The search strategy for the NIPH research map on COVID-19 related publications is described in the protocol for the COVID-19 map (Vist et al 2020).

To search the EndNote database, we will use a range of words and expressions that describe the population of interest, such as: socio-demographic, socio-economic, inequalities, social vulnerability, social stratification, income, disadvantaged, low education, out of work, immigrants, minority groups, ethnicity, and more. The EndNote database covers research on COVID-19 published between December 2019 and October 25 2020.

As a supplement to the database search, we will visit websites of relevant Scandinavian research institutions to identify reports and other non-journal publications. We will also check the reference lists of included studies.

A complete list of keywords used to search the EndNote database for the NIPH systematic and living map on COVID-19 evidence, as well as an overview of visited web pages, will be published as an appendix to the final report.

Study selection

Two persons will, independent of each other, assess title and abstract for all the search results according to our inclusion criteria. We will use Rayyan (Ouzzan et al 2016) for this process. References considered relevant at this stage will be read in full text. Similarly, the full text publications will be assessed for relevance by two review authors independent of each other according to our inclusion criteria.

If we identify systematic reviews, we will look at them first. Systematic reviews will be evaluated using the AMSTAR checklist. If we find a systematic review that are both up-to-date, of high quality and that answers our questions, we will stop our review process and communicate the results of existing reviews to the commissioners.

Data collection

From each included study we will note the full reference, the study design and method of analysis, including adjustments for age and comorbidities that has been conducted in the studies.

Related to the population, we will extract information, as presented in the publications, about specifically mentioned exposure to COVID-19, and other information about the population according to the PROGRESS equity lens (O'Neil et al 2014) and record the available information in data extraction tables on

Place of residence, including country, setting and if reported also the infection rate at the time of the study

Race, ethnicity, culture and language, note country of birth if recorded

Occupation

Gender/sex

Religion

Education

Socio-economic status

Social capital

We aim to note if and which of these components that were adjusted for in analysis.

The reported health related outcomes will be recorded and results pertaining to prevalence of COVID-19 infection, COVID-19 related admission to hospital, COVID-19 related admission to intensive care unit, COVID-19 related use of ventilator and COVID-19 related mortality will be recorded.

One review author will perform the data extraction and another person will check that the extraction is correct and complete.

Assessment of risk of bias

Two review authors will independently assess the risk of bias of included studies and systematic reviews. Any disagreement will be solved by discussion or involvement of a third review author. Systematic reviews will be assessed using the AMSTAR checklist (Shea et al 2017). Cohort studies, cross-sectional studies, and prevalence studies will be assessed using the JBI cohort checklist, the JBI cross-sectional checklist and the JBI prevalence checklist respectively (JBI 2018).

Data synthesis

Dichotomous outcomes will be presented as risk ratios (RRs) with 95% confidence intervals (CIs). We plan to use Review Manager (RevMan 5.4) software to generate forest plots and conduct meta-analysis if relevant. Attrition will be handled using intention-to-treat analysis. We will use random effects model and assess statistical heterogeneity using the Q test and I^2 statistic.

Analysis plan:

Population: If sufficient similar information is available we plan to conduct meta-analysis; first including studies from Norway, Denmark, Finland, Iceland and Sweden. As a secondary analysis, we will also include studies from Austria, Belgium, the Netherlands and New Zealand. We will look at

- Prevalence of COVID-19 in these population
- Severity of the disease (COVID-19) in these populations represented by the two outcomes admission to hospital and mortality

Finally, if relevant, we plan to look at subgroups separately according to selected items in the PROGRESS framework: Ethnic groups, Socio-economic status, Place of residence, Level of education, Occupation.

Assessment of confidence in the findings

We plan to use the Grading of Recommendations Assessment, Development and Evaluation method (Balsheim et al 2011) to assess our confidence in the evidence for each outcome in this systematic review.

Peer review of the protocol and report

This protocol and the resulting systematic review will be peer reviewed by two NIPH employees experienced on the methodology of systematic reviews and two content experts.

Timeframe

Start date: 26102020 **End date:** 15012021

Deliverables and publication

This systematic review will be published on the webpages of the Norwegian Institute of Public Health, fhi.no.

We may consider writing an article for an international journal.

Keyword: Emigrants and Immigrants; Health Status Disparities; Minority Health; Social Conditions; Socioeconomic Factors; Vulnerable Populations; COVID-19.

Related NIPH projects/publications/studies

Lauvrak V, Juvet L. Social and economic vulnerable groups during the COVID-19 pandemic, Rapid review 2020. Oslo: Norwegian Institute of Public Health, 2020.

<https://www.fhi.no/publ/2020/sosialt-og-okonomisk-sarbare-eller-utsatte-grupper-under-covid-19-pandemien/>

Flodgren GM, Vestrheim DF, Brurberg KG. COVID-19: Risk factors associated with disease severity – a rapid review, 2nd update. [Covid-19 og risikofaktorer for alvorlig sykdom - en hurtigoversikt, andre oppdatering. Hurtigoversikt 2020] Oslo: Norwegian Institute of Public Health, 2020.

Himmels JPW, Borge TC, Brurberg KG, Gravningen KM, Feruglio SL, Berild JD. COVID-19: COVID-19 and risk factors for hospital admission, severe disease and death [Covid-19 og risikofaktorer for sykehusinnleggelse, alvorlig sykdom og død - en hurtigoversikt, tredje oppdatering. Hurtigoversikt 2020] Oslo: Norwegian Institute of Public Health, 2020. <https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2020/covid-19-and-risk-factors-for-hospital-admission-severe-disease-and-death-3rd-update-memo-2020.pdf>

References

Lager A, Tynelius P, Walander A, Nederby Öhd J, Ponce de Leon A, Zhou M, Burström B, Yacamán Méndez D, Fischer M, Hergens MP, Bartelink V. Covid-19 i Stockholms län till och med mitten av juni 2020. Förloppet och den geodemografiska spridningen. Stockholm: Centrum för epidemiologi och samhällsmedicin, Region Stockholm; 2020. Rapport 2020:6. <https://ces.sll.se/globalassets/verksamheter/forskning-och-utveckling/centrum-for-epidemiologi-och-samhallsmedicin/folkhalsoguiden/rapporter-och-faktablad/rapport-2020.6-covid-19-i-stockholms-lan-till-och-med-mitten-av-juni-2020-uppdaterad-2020-07-13.pdf>

Slot LV, Søndergaard JK, Zaken S. Corona rammer skævt – etnicitet og smitte. Institut for Menneskerettigheder, Denmark 2020. https://menneskeret.dk/sites/menneskeret.dk/files/media/billeder/udgivelser/ligebehandling_2020/rapport_corona_rammer_skaevt.pdf

Public Health England, Disparities in the risk and outcomes of COVID-19. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf

Statistics Norway, 2020. <https://www.ssb.no/innvandring-og-innvandrere/faktaside/innvandring>

NKVTS. Flyktninger og asylsøkere – familier, barn og enslige under koronapandemien: Hva er risikofaktorer og hvem kan fange opp sårbare personer? 2020. <https://www.nkvts.no/content/uploads/2020/04/Koronapandemien-Flyktninger-og-asyls%C3%B8kere-familier-barn-enslige.pdf>

Vrålstad S og Wiggen KS (red.) 2017. Levekår blant innvandrere i Norge 2016, SSB rapport 2017/13. <https://www.ssb.no/sosiale-forhold-og-kriminalitet/artikler-og-publikasjoner/attachment/309211>

SSB 2020a, Statistikkbanken 11607: Sysselsatte innvandrere etter alder. 4. kvartal, etter alder, kjønn, landbakgrunn, statistikkvariabel og år [lastet ned 29.11.2020] <https://www.ssb.no/statbank/table/11607>

SSB 2020b, Statistikkbanken 09430: Utdanningsnivå, etter innvandringskategori, fagfelt, alder og kjønn 1980 - 2019 [lastet ned 29.11.2020] <https://www.ssb.no/stat-bank/table/09430>

Statistics Norway 2020b. <https://www.ssb.no/en/innvbef>

Dalstra JA, Kunst AE, Borrell C, et al. 2005. Socioeconomic differences in the prevalence of common chronic diseases: an overview of eight European countries. *Int J Epidemiol* 34(2):316-26. <https://doi.org/10.1093/ije/dyh386>

Folkehelseinstituttet. Helsetilstanden i Norge 2018. [Public Health in Norway 2018] Rapport 2018. Oslo: Folkehelseinstituttet, 2018. <https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2018/helsetilstanden-i-norge-20182.pdf>

Gallo V, Mackenbach JP, Ezzati M, et al. 2012. Social inequalities and mortality in Europe--results from a large multi-national cohort. *PLoS ONE* 7(7):e39013. <https://doi.org/10.1371/journal.pone.0039013>

Kivimäki M, Batty GD, Pentti J, et al. 2020. Association between socioeconomic status and the development of mental and physical health conditions in adulthood: a multi-cohort study. *The Lancet Public Health* 5(3):e140-e49. [https://doi.org/10.1016/S2468-2667\(19\)30248-8](https://doi.org/10.1016/S2468-2667(19)30248-8)

Mackenbach JP, Kulhánová I, Artnik B, et al. 2016. Changes in mortality inequalities over two decades: register based study of European countries. *BMJ (Clinical research ed)* 353:i1732-i32. <https://doi.org/10.1136/bmj.i1732>

Elgar FJ, Stefaniak A, Wohl MJA. 2020. The trouble with trust: Time-series analysis of social capital, income inequality, and COVID-19 deaths in 84 countries. *Social science & medicine* 1982; 263:113365-65. <https://doi.org/10.1016/j.socscimed.2020.113365>

Lauvrak V, Juvet L. Social and economic vulnerable groups during the COVID-19 pandemic, Rapid review 2020. Oslo: Norwegian Institute of Public Health, 2020. <https://www.fhi.no/publ/2020/sosialt-og-okonomisk-sarbare-eller-utsatte-grupper-under-covid-19-pandemien/>

Himmels JPW, Borge TC, Brurberg KG, Gravningen KM, Feruglio SL, Berild JD. COVID-19: COVID-19 and risk factors for hospital admission, severe disease and death [Covid-19 og risikofaktorer for sykehusinnleggelse, alvorlig sykdom og død - en hurtigoversikt, tredje oppdatering. Hurtigoversikt 2020] Oslo: Norwegian Institute of Public Health, 2020. <https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2020/covid-19-and-risk-factors-for-hospital-admission-severe-disease-and-death-3rd-update-memo-2020.pdf>

Eikemo, T. A., & Bambra, C. (2008). The welfare state: a glossary for public health. *Journal of Epidemiology & Community Health*, 62(1), 3-6.

Esping-Andersen G. The three worlds of welfare capitalism. London: Polity, 1990.

Scruggs, L. A., & Allan, J. P. (2008). Social stratification and welfare regimes for the twenty-first century: Revisiting the three worlds of welfare capitalism. *World Politics*, 60(4), 642-664.

Nasjonalt kunnskapscenter for helsetjenesten. Slik oppsummerer vi forskning. Håndbok for Nasjonalt kunnskapscenter for helsetjenesten. Oslo: Nasjonalt kunnskapscenter for helsetjenesten; 2015. Tilgjengelig fra: https://www.fhi.no/globalassets/dokumenterfiler/tema/bruker erfaring/2015_handbok_slik_oppsummerer_vi_forskning.pdf.

Vist GE, Muller AE, Flottorp S, Himmels J, Van de Velde S, Smedslund G, Hafstad EV, Nylenna M, Holtermann MK, von Mehren Sæterdal I, Forland F, Juvet L, Laake I, Vestrheim DF, Schünemann H, Ottersen T. A systematic and living evidence map on COVID-19: a protocol. Norwegian Institute of Public Health. 2020. <https://www.fhi.no/contentassets/e64790be5d3b4c4abe1f1be25fc862ce/covid-19-evidence-map-protocol-20200403.pdf> the systematic and living evidence map on COVID-19 is here: <https://www.fhi.no/en/qk/systematic-reviews-hta/map/>

Ouzzan M H, H, Fedorowicz, Z, Elmagarmid, A Rayyan — a web and mobile app for systematic reviews. *Systematic Reviews*. 2016;5:210.

O'Neill J, Tabish H, Welch V, Petticrew M, Pottie K, Clarke M, Evans T, Pardo JP, Waters E, White H, Tugwell P. Applying an equity lens to interventions: using PROGRESS ensures consideration of socially stratifying factors to illuminate inequities in health. *Journal of Clinical Epidemiology* 2014; 67: 56e64. <http://dx.doi.org/10.1016/j.jclinepi.2013.08.005>

Shea, B.J., Reeves, B.C., Wells, G., et al., 2017. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ* 358, j4008. <https://doi.org/10.1136/bmj.j4008>.

Johanna Briggs Institute. Critical Appraisal Tools 2018 [Available from: <http://joannabriggs-webdev.org/research/critical-appraisal-tools.html>

Balshem H HM, Schünemann H, Oxman A, Kunze R, Brozek J, et al. . GRADE guidelines: 3. Rating the quality of evidence. *J Clinl Epidemiol* 2011;64:401-6.