Evidence to support safe return to clinical practice by oral health professionals in Canada during the COVID-19 pandemic: A report prepared for the Office of the Chief Dental Officer of Canada.

November 2020 update

This evidence synthesis was prepared for the Office of the Chief Dental Officer, based on a comprehensive review under contract by the following:

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Introduction

During May and June 2020, a research team completed a rapid review of the literature to support the safe practice of Canadian dental professionals during the COVID-19 pandemic. Following input from stakeholders on the draft report in mid-July, the report was finalized and submitted July 31st and then published on the Canada.ca website in both official languages in September 2020. The review covered literature published from January 1st 2000 to June 30th 2020. With the rapid pace of new publications linked to the COVID-19 pandemic, the Chief Dental Officer of Canada determined that updates to the report are needed three times during the year following the first report. These updates are to cover scientific literature published between July 1st and October 31st 2020, between November 1st 2020 and February 28th 2021 and finally between March 1st and June 30th 2021. This is the first of those update reports adding relevant literature published during the period covering July 1st to October 31st 2020.

This first update will use the same structure as the original report, addressing the same nine questions. In response to each question, we include: the rationale for the question (the same as the previous report); the summary response provided in the previous report; and then a summary of the new literature. The references are only those identified for the relevant update period (July 1st to October 31st 2020) and appended tables contain only material from newly identified references. Readers should return to the previous report for original lists of references and other relevant material. The original report can be found at: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/evidence-safe-return-clinical-practice-oral-health.html?utm_source=Emailblast&utm_medium=Email&utm_campaign=McGill_report_covid_ENG

Project goal

To create a knowledge product around which the Office of the Chief Dental Officer of Canada can convene a representative knowledge-based group of the national oral health professional domain, in order to generate a single high-level national expert document which Canada's oral health regulatory authorities may then choose to consult in developing consistent guidance for their respective registrants at the Provincial/Territorial level. Further, educators, program officials and policy makers may also choose to consult this document as they carry out their respective responsibilities.

When reading this report it is important to recognize three essential points:

- With the exception of the first two topics, which are related to the disease COVID-19 itself, the remaining topic concerning interventions in oral health care and the literature searches reflect reference to oral health care. The report therefore focuses on evidence directly related to oral health care. However, where relevant, we also refer the reader to Health Canada websites for pertinent information.
- This document does not provide guidelines or recommendations. This is the role of the relevant federal, provincial, and territorial authorities. The role of this document is to highlight high quality evidence that such authorities and others in leadership roles can use as they decide what guidance to give oral health professionals in Canada.

This document focuses on evidence that is categorized as high quality using internationally recognized hierarchies of evidence [1] [2] [3]. These are in descending order:

1. Systematic reviews and meta-analyses
2. Randomised controlled trials with definitive results (confidence intervals that do not overlap the threshold clinically significant effect)
3. Randomised controlled trials with non-definitive results (a point estimate that suggests a clinically significant effect but with confidence intervals overlapping the threshold for this effect)
4. Cohort studies
5. Case-control studies
6. Cross sectional surveys
7. Case reports
8. Expert opinion

Specific objectives

1. To update the previously published comprehensive review of the literature concerning key issues that inform the provision of oral health care by relevant providers in Canada during the COVID-19 pandemic. Those key areas are:

a) Which patients are at greater risk of the consequences of COVID-19 and so consideration should be given to delaying elective in-person oral health care?
b) What are the signs and symptoms of COVID-19 that oral heal professionals should screen for prior to providing in-person health care?
c) What evidence exists to support patient scheduling, waiting and other non-treatment management measures for in-person oral health care?
d) What evidence exists to support the use of various forms of personal protective equipment (PPE) while providing in-person oral health care?
e) What evidence exists to support the decontamination and re-use of PPE?
f) What evidence exists concerning the provision of aerosol-generating procedures (AGP) as part of in-person oral health care?
g) What evidence exists to support transmission mitigation strategies during the provision of in-person oral health care?
h) What evidence exists to support space ventilation strategies that reduce the risk of transmission?
i) What evidence exists to support the disinfection of surfaces in spaces in which oral health care is provided?

2. To prepare a written report documenting the updated findings of the aforementioned literature searches. The report is prepared in a manner that provides clear and concise information to decision-makers (individuals providers or organizational) highlighting where strong to no levels of scientific evidence exist to support different approaches.

Methods used to identify and include relevant literature

The same methodological approach was used for this update as was used in the original report. A more detailed methodological description is available in Appendix J. In summary, search words and phrases were identified for each of the above topic areas a) to i), and searches were performed for English language articles, in standard scientific literature databases for the period July 1st to October 31st 2020. Two steps were then used to include publications in this report/process: i) step 1 was a review of abstracts to decide on the relevance of publication content for the topic areas; and ii) step 2 was to include only those publications reporting the results of prospective cohort studies, randomized controlled trials, systematic reviews and/or meta-analyses. Steps 1 and 2 were done by one author and a random number of publications were reviewed in the same way by a second author so as to ensure reliability of the findings. An additional, separate search was performed of the bibliography supporting relevant national, provincial and state guidelines concerning oral health care provision during the COVID-19 pandemic in Canada and the USA. Any publications identified in this bibliography that were not in our aforementioned search, but which fulfilled the quality criteria in step 2 and were published during the relevant period were also included in this update report.

With respect to step 1, concerning relevant subject areas, as well as searching for COVID-19 and SARS-CoV-2, we also searched for similar respiratory tract viruses such as SARS, MERS, H1N1 and influenza. In reporting the results of our work, we have made clear whether the evidence concerns COVID-19, SARS-CoV-2, SARS, MERS, H1N1, influenza and sometimes other pathogens. In reality, much of the work reported is in the form of systematic reviews that cover a range of relevant pathogens and diseases.

With respect to step 2, concerning the inclusion of only that evidence fulfilling certain levels of quality, this was taken to enable this review to focus only on strong evidence in support of various approaches and concepts. This means that any evidence we highlight is of high quality. However, where we state that there is no evidence using our quality criteria, it does not mean there is no evidence at all, rather it means that evidence that exists is not of high enough quality to be included in our review. This is particularly important to note in the context of the current pandemic wherein there are a very high number of publications emerging from rapidly performed research, which for good reasons, may not be of the quality ideally desired. There are also many documents containing the opinions of experts, which are valuable in the circumstances, but which are recognized to be low in the hierarchy of quality of evidence.

Report structure

This report will address each of topics a) to i) in turn. For each topic, we provide the rationale for the question (the same as the previous report); the summary response provided in the previous report; and then a summary of the new literature, stating how strong the evidence is. The main body of the report contains only these summaries; however, each topic has an appendix containing a tabular summary of included papers, with summary data where appropriate. Readers of this report who are interested in more detailed information will need to access the relevant papers themselves. We also make clear where evidence is related to COVID-19/SARS-CoV-2 or related to similar respiratory tract viruses such as SARS, MERS, H1N1 and influenza. Finally, where pertinent, we refer readers to relevant Health Canada websites.

Summary of update report

This section provides an overview of the findings reported in the different sections. For more detailed information and for the references, see the relevant sections.

We identified a large number of new systematic reviews and meta-analyses concerning the symptoms of people diagnosed with COVID-19 and the risk factors for serious consequences such as hospitalization, ventilation and death among those patients. Many of these reviews and analyses confirmed data presented in the previous report. The evidence is strong that the most common signs and symptoms experienced by people diagnosed with COVID-19 are fever, cough, fatigue and muscle aches, shortness of breath, sputum, headache, sore throat and gastrointestinal symptoms, including diarrhea. New strong evidence has emerged reporting loss of sense of smell and altered sense of taste as common symptoms. With respect to risk factors for serious consequences of COVID-19, the evidence is strong for increased risk among people with cardiovascular diseases, hypertension, diabetes, chronic respiratory diseases, liver and kidney diseases, obesity and smokers. Newly added risk factors are people with cancer and cerebrovascular conditions. In terms of sociodemographic factors, the evidence is strong that increased age augments the risk of serious consequences, with this increased risk beginning to emerge particularly for those 60 years and older. There is now good evidence in the international literature indicating men being at increased risk for COVID-19 and its consequences, although it is not clear why – is it biological or because of their work, socializing habits and/or smoking and alcohol consumption? However, it is important to note that in Canada, the incidence of COVID-19 is higher in women. There is also some evidence to indicate that when studies control for socioeconomic factors, there are no racial differences in serious consequences for COVID-19.

While the evidence concerning the disease itself is increasingly strong, the evidence supporting different interventions pertinent to oral health care remains minimal and weak and relatively little work has been published in the period since the first report. In terms of clarifying guidance for oral health professionals, one systematic review highlights the categories of actions in pre-treatment, during treatment and post-treatment phases of care that organizations around the world have concentrated on, although this does not mean the relevant actions are based on evidence, rather that these are common areas to consider. Another review of guidelines for dental care during the pandemic noticed an increasing focus on preventive and non-Aerosol Generating Procedures (AGPs) and another highlighted the need to develop an evidence-based classification of AGPs and non-AGPs in dentistry rather than the theoretical approaches used thus far.

In terms of PPE, the picture remains unclear in terms of evidence directly related to oral health care, although the evidence does suggest using combined forms of facial covering (e.g. face visor and N95 mask) is better than just one, as no single interventions are fully effective in preventing transmission. There is emerging evidence that N95 masks can be microwaved and re-used at least once without loss of function but there remains no evidence supporting various mitigating approaches such as use of pre-treatment mouthwash, rubber dam and high-volume evacuation. There is evidence that chlorhexidine mouthwash reduces bacterial colony-forming units but none on this or other mouthwashes concerning viruses or disease transmission.

There is emerging evidence concerning the risk factors for Health Care Workers (HCWs) being infected with COVID-19, plus the impacts of the disease on them, which are both relevant in terms of considering how to mitigate risks and impacts. Suggestions have been made for HCWs concerning reducing hours and increasing mental support services.

Report results

a. **WHICH PATIENTS ARE AT GREATER RISK OF THE CONSEQUENCES OF COVID-19 SO CONSIDERATION SHOULD BE GIVEN TO DELAYING ELECTIVE IN-PERSON ORAL HEALTH CARE?**

Why is this question important?
Many forms of oral health care are elective and can reasonably be delayed if the provision of that care increases the risk of serious consequences for the patient. For instance, under normal, non-pandemic circumstances, many forms of non-urgent oral health care are delayed among patients undergoing cancer therapy, immunosuppressive therapy or treatment for mental health issues. In the pandemic, it is important for dental professionals to consider which patients of theirs are at risk for serious consequences (e.g. hospitalization, serious comorbidities and even death) should they become COVID-19 positive. Depending on the local community prevalence of COVID-19, the act of traveling to a dental office and then undergoing treatment may increase the risk of that patient becoming COVID-19 positive. It is therefore important to consider which patients are at risk of serious consequences should they become infected.

Summary of findings from original report (with references removed)
Several systematic reviews have consistently provided strong evidence that hypertension, diabetes, cardiovascular and coronary artery disease, plus chronic respiratory diseases are associated with increased risk for severe COVID-19 disease, including hospitalisation, admission to intensive care, the need for ventilation and mortality. Furthermore, two systematic reviews provided strong evidence that current smokers compared to previous and non-smokers were at greater risk of severe disease and mortality. Two more systematic reviews provided strong evidence that people with chronic kidney disease are at increased risk of severe COVID-19, with one of these reviews noting that the SARS-CoV-2 virus can directly affect the kidneys leading to acute renal injury and mortality. One of these systematic reviews also noted that people with chronic liver disease are at increased risk for severe COVID-19 and mortality due to the disease, while another reported weaker evidence of liver damage through COVID-19. A scoping review reported some evidence that people with pre-existing cerebrovascular problems are at increased risk for severe COVID-19, including admission to intensive care. Finally, in terms of systemic conditions that can affect prognosis in those diagnosed with COVID-19, another systematic review of adults and children who are immunosuppressed, through cancer therapy, transplantation or immunodeficiency, found limited evidence that they had improved outcomes compared to the general population.

Several systematic and scoping reviews have been performed to document information concerning the relationship between COVID-19 and pregnancy, maternal and infant health. All the studies included in the reviews involved relatively low numbers so the available evidence emerging from these reviews is limited. That said, authors observed that the majority of mothers had no complications, that vertical transmission from mother to foetus appears not to occur but remains possible, but that viral transmission from mother to child can occur during or shortly after birth. However, all reviews stated that they were unable to draw firm conclusions given the numbers and study designs.

Among demographic factors, strong evidence was found for older age (defined as 65 years and older) to predict severe COVID-19 in two systematic reviews but the evidence for sex was more equivocal with one systematic review concluding that males were at greater risk for severe disease while another found no difference between sexes. Finally, one systematic review noted that children are often asymptomatic but can transmit COVID-19.

July to October update summary

We identified multiple systematic reviews, meta-analyses and a few cohort studies adding to the knowledge and understanding of which patient groups are at greater risk of severe consequences of having COVID-19. The large majority of these studies confirmed findings we described in the previous report. Nevertheless, there have been some important additional findings with strong evidence supporting them. Recently published reviews and meta-analyses confirmed the increased risk for serious consequences of COVID-19 including hospitalization, ventilation and death for people with cardiovascular diseases [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17], hypertension [4] [5] [6] [7] [8] [9] [10] [11] [12] [17] [18] [19] [20], respiratory diseases [5] [7] [10] [11] [12] [18] [21] [22] [23], diabetes [4] [5] [7] [8] [10] [11] [19] [20] [24] [25] [26] [21] [27] [28], liver [12] [29] [30] [31] and kidney diseases [5] [8] [11] [12] [14] [32] [33] [34] [22] [35] [36] [37] [38] [39] plus for smokers [18]. New information adds to the list of at-risk people who are obese [20] [40] [41] [42] [43], have cancer [11] [44] [45] [46] [47] and cerebrovascular conditions [10] [11] [12] [13] [17] [48] [49] [50] [51].

In terms of sociodemographic and cultural factors, again there has been additional high-quality evidence published. It is clear that increased age increases the risk of serious consequences [20] [49] [52] [53] with one review clarifying that the peak increase in risk is for serious consequences starts to occur for those 50-59 years of age but the largest risk increase is for the 60-69 year olds compared to those in their 50s, although the risk keeps increasing with older age [52]. With respect to sex, it is now clear from the international literature that the incidence of COVID-19 is greater in men than women [10] [19] [54] [55]. However, it is important to note that in Canada, the incidence of COVID-19 is higher in females compared to males, although this varies by age group (see https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19/epidemiological-economic-research-data.html). In terms of disease outcomes, again the international literature shows men are at increased risk for serious consequences of COVID-19 including death [20] [54] [56] [57] [58] However, these studies also pointed out that it is not clear why men are at greater risk for worse outcomes. They could be at increased risk because of the nature of their work, their socializing habits, their smoking, alcohol consumption and/or levels of comorbidities [20] [58]. In Canada, there have been more hospitalizations and deaths among women but more men admitted to intensive care units (again see https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19/epidemiological-economic-research-data.html). Further research needs to be performed to better understand this phenomenon.

With respect to COVID-19 in pregnancy, the evidence remains relatively limited because the numbers are considerably smaller than in the broader population studies. Nevertheless, there is limited, emerging evidence that pregnant women with COVID-19 are at increased risk for complications with their pregnancy [59] [60] [61] [62]. There is also emerging limited evidence concerning the problems suffered by neonates who are COVID-19 positive [59] [60] [63] [64] [65].

With respect to the possibility of vertical transmission from mother to foetus, one systematic review reported zero such cases [64] while two others reported rates of 2-3.2% of neonates testing positive for SARS-Cov-2 among babies born to mothers who were also SARS-Cov-2 positive [61] [66].

A good evidence-supported document concerning the risk factors for severe COVID-19 disease can be found at: https://www.canada.ca/en/public-health/services/publications/diseases-conditions/people-high-risk-for-severe-illness-covid-19.html

b. WHAT ARE THE SIGNS AND SYMPTOMS OF COVID-19 THAT ORAL HEALTH PROFESSIONALS SHOULD SCREEN FOR PRIOR TO PROVIDING IN-PERSON HEALTH CARE?

Why is this question important?
While it is recognized that many people infected with SARS-CoV-2 are asymptomatic for varied periods of time, many do have symptoms and oral health care professionals may consider it prudent for the health and safety of patients, staff and themselves to delay care for a patient who has symptoms suggesting they may have COVID-19, who has been recently diagnosed with the disease or who lives with someone who has symptoms and or who has been diagnosed with COVID-19. Knowing the signs and symptoms associated with the disease is therefore important to enable screening of patients prior to in person oral health care.

Summary of findings from original report (with references removed)
Several systematic reviews involving collectively many thousands of patients have consistently provided strong evidence reporting that the most common symptoms experienced by adults with COVID-19 are fever (approximately 80-90% of those diagnosed with the disease), cough (60-67%), fatigue and muscle aches (30-50%) and shortness of breath (21-45%). One other systematic review providing strong evidence and a scoping review providing weaker evidence also reported patients with sputum (28%) headache (8-12%), sore throat (10%) and gastrointestinal symptoms (9%), including diarrhea (6-7%). Two other systematic reviews focusing on neurological signs and symptoms associated with COVID-19 noted that headache and altered sense of smell and taste were relatively common, although the prevalence ranged significantly due to the often-small size of the studies, all of which were hospital rather than community based.

In relation to symptoms of COVID-19 experienced by pregnant women and new-born babies, some of the same reviews referred to in section a) in relation to maternal and new-born health reported that pregnant mothers with COVID-19 experienced the same symptoms as other adults. However, another systematic review of COVID-19 in children reported that a higher proportion of new-born babies with the disease were severely ill compared to children and younger adults, with most of them suffering difficulty breathing. The same review, however, reported that 0-18-year-old children and adolescents tend to have mild or moderate disease only and they concluded that SARS-CoV-2 affects this age group less than adults. Interestingly, a systematic review concerning MERS-CoV reported that children were more likely to be asymptomatic.

A good evidence-supported document concerning risk of severe consequences of COVID-19 can be found at https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/signs-symptoms-severity.html

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We identified multiple systematic reviews and meta-analyses plus prospective cohort studies adding to the now strong literature on the signs and symptoms of COVID-19. The additional literature we identified largely confirmed the summary and list of symptoms provided in the earlier report (fever, cough, shortness of breath, fatigue and muscle weakness and aches, headache and digestive symptoms such as diarrhea [5] [9] [10] [19] [67] [68] [69] [70] [71] [72]), although notable new information has been added. This includes new signs and symptoms now recognized as among those often shown by people with COVID-19, including anosmia (lost sense of smell; 39-88%) [69] [70] [73] [74] and dysgesia (altered sense of taste; 81%) [74]. There were also important additions to the previous list of signs and symptoms, including loss of appetite (34%) [5], myocardial injury (16%) [75], dizziness (6%) [19] and confusion/agitation (5%) [70]. On top of this, there has been additional literature concerning symptoms experienced by children with COVID-19, including fever (53%), cough (39%) and sore throat (14%) [76]. The evidence concerning the symptoms experienced by pregnant women with COIVD-19 remains relatively limited compared to the general population but new information now available includes estimates of the proportion of pregnant women with viral pneumonia (71-89%) [60], fever (44-63%) [60] [65] [77], cough (36-71%) [60] [65] [77], dyspnea (13-34%) [65] [77] and myalgia or fatigue (11%) [60].

A good evidence-supported document concerning signs and symptoms of COVID-19 can be found at https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/signs-symptoms-severity.html

c. WHAT EVIDENCE EXISTS TO SUPPORT PATIENT SCHEDULING, WAITING AND OTHER NON-TREATMENT MANAGEMENT MEASURES FOR IN-PERSON ORAL HEALTH CARE?

Why is this question important?

While much of the focus in the provision of oral health care during the pandemic focuses on in-person health care itself, other elements of the appointment are also potentially important sources of COVID-19 transmission. Strategies to reduce the risk of transmission prior to and following the health care intervention are therefore also very important.

Summary of findings from original report (with references removed)

We identified limited evidence fulfilling our quality criteria supporting any patient scheduling, patient waiting, patient follow-up and other non-treatment protocols or approaches. Most of the evidence we identified was related indirectly to the topic but is nevertheless potentially useful.

In 2010, following the H1N1 pandemic, a systematic review investigated the evidence to support the wearing of face masks in health care settings and in the community to prevent transmission of influenza viruses. They concluded that there is some evidence to support the wearing of masks or respirators to prevent infection of others (i.e. to wear a mask when an individual has influenza) but less evidence to support a mask protecting an individual from being infected.

A systematic review published in 2011 investigated physical interventions in preventing respiratory virus transmission. It included screening at entry ports, isolation, quarantine, social distancing, barriers, personal protection and hand hygiene, although these interventions were not focused on health care settings. They concluded that simple, low cost measures including physical barriers, isolation, hand hygiene and N95 and surgical masks are useful for reducing transmission of respiratory viruses. They stated that N95 masks appear as effective in transmission reduction as surgical masks but are more expensive, uncomfortable and irritating to skin.

Recently, a non-systematic review was published concerning evidence to support the 1-2 metre spatial distancing guidelines of multiple international, national and regional agencies. They found that there is sparse evidence to support such guidelines and indeed reported 8 studies of droplets traveling more than 2 metres, with several reporting droplets traveling up to 8 metres. They reported that SARS-CoV-2 virus can be detected in the air 3 hours after aerosolization and raise questions over the dichotomization of droplet versus aerosol transmission routes.

However, another systematic review and meta-analysis investigating the optimum distance for avoiding person-to-person virus transmission and the use of face masks and eye protection to prevent transmission of viruses was recently published providing strong observational evidence supporting all these measures. The review noted that there were no randomized trials testing these measures but they identified 172 observational studies and 44 non-randomized comparative studies in health care and non-health care settings. They reported an 82% reduction in transmission with one metre distancing compared to less and additional risk reduction per added meter distancing. They also reported an 85% reduction in risk with mask or respirator wearing, with respirators providing increased risk reduction compared to masks. Eye protection also provided approximately 78% reduction in risk of transmission.

A systematic review of the causes and contributing factors for infection transmission in long-term care facilities reviewed literature published during the period 2007-18. It concluded that the most commonly transmitted pathogen is influenza virus and that inadequate infection control procedures in those institutions, particularly hand hygiene and decontamination of surfaces, were the most frequent contributors to transmission.

One source of evidence directly related to dental care was a systematic review of cross-infection control in dental laboratories (i.e. the site of fabrication of prostheses and other intra-oral devices, which receive material and devices that have often been in people's mouths and so are contaminated). This paper reported that flaws in several procedures and protocols in this environment were very common. These included vaccination policies, biological safety of the work environment, use of protective equipment, organisation of cross-infection control procedures and disinfection strategies. They stated that the literature focuses on the need for improving the organization of cross-infection control procedures and training in disinfection in dental laboratory settings.

Finally, our search identified two systematic reviews concerning the use of "teledentistry". Clearly this is only indirectly related to the topic c) but nevertheless is a potential means to reduce disease transmission, while at the same time managing patient care. Teledentisrtry is a branch of "telehealth" that "uses communications networks for delivery of health care services and medical education from one geographical location to another". These two reviews were published prior to the pandemic and both observed that there has been limited research investigating teledentistry and the work that has been done has mainly been in specialty fields such as pediatric dentistry, orthodontics and oral medicine. However, they concluded that there is evidence to support the efficacy of teledentistry in screening for some conditions and that the approach is accepted well by dentists and patients alike. They did, however, note that more research is required to support effectiveness for a variety of roles in different settings to aid the development of guidelines and protocols, and that cost-effectiveness studies are required to establish if teledentistry is really an effective means of providing some forms of care at less cost to all concerned.

None of these studies refer directly to the non-treatment management of patients in dental clinics but they do provide important background information to consider. Also, it is important to note that in the absence of strong evidence to support certain measures, there are clear guidelines concerning these elements of health care provision provided by Health Canada (https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/interim-guidance-outpatient-ambulatory-care-settings.html).

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Again, several relevant systematic reviews were identified. One relevant publication reviewed COVID-19 transmission risk and protection protocols published by organizations in countries throughout the world and in academic journals [78]. They categorized the approaches they found common to all protocols in these publications into pre-, during and post-dental treatment measures as per Table 1 below. It is important to note that this summary of factors common to all reviewed dental COVID-19 protocols does not necessarily reflect any evidence to support their inclusion, or exactly what the advice for each factor is, rather it is a list of factors in dental COVID-19 dental protocols that were common to all review publications.

Table 1. Measures recommended in dental protocols identified in systematic review by Banakar et al [78]**.**

Stage of care	Measures recommended
Pre-dental treatment	
Before entering a dental office	Patient triage, identification potential COVID-19 cases, delay of non-urgent dental care, management of dental appointments, active screening of dental staff.
At the dental office	Active screening of patients, physical distancing in the dental office, cleaning and disinfection measures for patients, use of facemasks by everyone entering the dental office, patient

	education, use of personal protective equipment (PPE) by the dental team and management of the dental operatory room.
During dental treatment	Maintaining hand hygiene, offering preoperative anti-microbial mouth rinse to patients, using rubber dams, high-volume saliva ejectors, and extraoral dental radiographs, using 4-handed dentistry, avoiding aerosol-generating procedures, one-visit treatment and environmental cleaning and disinfection procedures.
Post-dental treatment	Cleaning and disinfecting reusable facial protective equipment, as well as management of laundry and medical waste.

This list of factors to consider and the categorization of the stages of pre-, during and post-dental treatment was very similar to those documented in two other systematic reviews on the subject [79] [80]. A review of guidelines for pediatric dentistry during the COVID-19 pandemic published throughout the world made similar observations but in addition, focused on the need for preventive and non-AGPs [81]. The authors mentioned focusing on using approaches including telehealth, using fluoride varnish and resin or sealing non-cavitated caries, using atraumatic restorative technique (ART), interim therapeutic restorations, indirect pulp capping, the Hall technique and silver diamine fluoride [81].

d. **WHAT EVIDENCE EXISTS TO SUPPORT THE USE OF VARIOUS FORMS OF PERSONAL PROTECTIVE EQUIPMENT (PPE) WHILE PROVIDING IN-PERSON ORAL HEALTH CARE?**

Why is this question important?
The available evidence suggests strongly that aerosol, droplet and transmission via fomites (e.g. clothes, furniture or other surfaces) are the routes of SARS-CoV-2 transmission. Given this, it is important to provide health care workers with the best available evidence concerning personal protective equipment (PPE) that is effective in reducing such transmission.

Summary of findings from <u>original report</u> (with references removed)
Most of the evidence fulfilling our quality criteria in this topic area concerned influenza or other coronaviruses. Nevertheless, the evidence reported is important to consider in the current pandemic.

A recently published Cochrane review that was an update of previous versions of a systematic review concerning what types of full body PPE and donning and doffing (putting on and taking off) procedures result in the least contamination among health care workers. This review reported finding low certainty evidence to support several important concepts: more body coverage results in less contamination but also less comfort and greater difficulty donning and doffing; more breathable PPE results in the same levels of contamination but more comfort for users; certain design elements of PPE that facilitate donning and doffing can reduce contamination; CDC guidance on donning and doffing, spoken instructions during doffing, one-step gown and glove removal, double-gloving and glove disinfection may reduce contamination; and face-to-face training concerning PPE use is better than written material.

A systematic review published in 2020 included a meta-analysis of 9,171 participants enrolled in randomized trials comparing N95 respirators with surgical masks in the prevention of influenza and similar viral diseases in mainly hospital but also household settings concluded that N95 respirators do not reduce the risk of contamination any more than surgical masks. They made the observation that N95 respirators are designed to protect the wearer but are less comfortable to wear and this may be the reason for their not being superior to surgical masks, which are more comfortable and are designed to protect the environment, not the user. Another systematic review and meta-analysis of N95 respirators compared to medical masks, came to the same conclusion: that there is low certainty evidence that N95 respirators and medical masks offer similar protection against viral respiratory infections when used by health care workers for non-aerosol-generating procedures. As referred to in discussing topic c), a systematic review of physical barriers to reduce the spread of respiratory viruses also concluded that N95 respirators were not superior to surgical masks and that the former are uncomfortable, often causing skin irritation. However, the systematic review and meta-analysis reported in section c) above, reported an 85% reduction in risk of transmission with mask or respirator wearing among health care providers, with respirators providing increased risk reduction compared to masks. This review, however, did not report a clear effect with aerosol versus non-aerosol generating procedures. They did however report that eye protection is associated with approximately 78% reduction in risk of transmission.

July to October update summary
We identified several systematic reviews with relevant information. One investigated the use of powered air-purifying respirators (PAPR) compared to N95 masks and other devices in the prevention of viral infection of health care workers, focusing on SARS-Cov-2, SARS-Cov-1, MERS and Ebola viruses. This review reported no difference in HCW infection rates using PAPR versus other respirator devices. They did note however, increased heat tolerance for HCWs using PARP but more difficulty communicating and with mobility [82]. Another review investigated the benefits for oral and maxillofacial surgeons of using N95 versus surgical masks when performing AGPs [83]. They concluded that most studies comparing the two showed no difference in infection rates of HCWs but there was some evidence suggesting that N95 masks may be better when performing an AGP with a patient known to be COVID-19 positive or whose status is unknown [83]. Another review of N95 and surgical masks and eyewear use in dental care reported that combined use of two or more measures (e.g. mask and facial visor) is effective as a barrier to aerolized microbes, although this can be affected by multiple factors such as airflow dynamics, aerolized particle size, prolonged wearing and wetness of masks and poor fit. Importantly, they noted that no intervention on its own has been demonstrated effective at preventing infection [84]. We identified no research evidence that referred specifically to KN95 masks.

Another review investigated the physical and mental health impacts of COVID-19 on HCWs during the pandemic [85] and reported that working in a high-risk setting, having a COVID-19-diagnosed family member, inadequate hand hygiene, improper PPE use, close contact with patients ≥ 12 times daily, extended contact hours (≥15 daily) and unprotected exposure are associated with increased risk of COVID-19-related impacts for HCWs [85]. They also noted that prolonged PPE usage led to cutaneous manifestations and skin damage, that HCWs experienced high levels of depression, anxiety, insomnia and distress, and that female HCWs and nurses are disproportionately affected [85]. All this suggests the need for vigilance with infection control procedures, shorter work hours and mental health support for HCWs [85].

The Health Canada website also has information concerning PPE: https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/medical-devices/personal-protective-equipment/overview.html

e. **WHAT EVIDENCE EXISTS TO SUPPORT THE DECONTAMINATION AND RE-USE OF PPE?**

Why is this question important?
In the global pandemic, throughout the world, including in Canada, there are shortages of and difficulties obtaining certain forms of PPE in a timely manner. Furthermore, given the massively increased demand throughout the world for such PPE, the cost of such items has increased. This has resulted in health care providers and organisations asking to what extent certain forms of PPE can be decontaminated and re-used?

Summary of findings from original report (with references removed)
We identified two recently published systematic reviews and one scoping review concerning the decontamination and re-use N95 respirators plus a systematic review investigating the same for surgical masks. All were published in 2020. With respect to N95 respirators, the scoping review concluded that the evidence supporting N95 respirator decontamination is sparse but that vaporized hydrogen peroxide and ultra-violet light are the most commonly cited means in the literature. One of the systematic reviews investigated decontamination of N95 respirators using ultra-violet germicidal irradiation (UVGI) using *in vitro* studies only and concluded that UVGI was able to decontaminate N95 respirators in laboratory settings without damaging them. The other systematic review concluded that a single cycle of vaporized hydrogen peroxide successfully removes pathogens without creating a safety problem for the user. They also observed that more than one such cycle may be feasible and effective, but that remains to be tested. Furthermore, they concluded that sodium hypochlorite, ethanol, isopropyl alcohol and ethylene oxide are not recommended for decontaminating N95 respirators.

The systematic review concerning the decontamination of surgical masks concluded that there is limited evidence and that they were unable to draw definitive conclusions on this subject.

July to October update summary
We identified one additional systematic review on this subject [86]. The review investigated the use of microwave and heat-based decontamination of N95 masks and found that microwave irradiation may provide safe and effective viral decontamination for N95 masks while conserving function but that autoclaving did not do the latter so is not supported. The authors did however note that more research needs to be performed in “real world settings” to confirm their conclusions [87].

f. WHAT EVIDENCE EXISTS CONCERNING THE PROVISION OF AEROSOL-GENERATING PROCEDURES (AGP) AS PART OF IN-PERSON ORAL HEALTH CARE?

Why is this an important question?
Oral health care commonly involves aerosol-generating and droplet-generating procedures due to the use of high and slow-speed handpieces (drills) and procedures such as ultrasonic scaling and tooth extraction. As stated above, there is good reason to believe that aerosol- and droplet-generating procedures are potential sources of transmission.

Summary of findings from original report (with references removed)
We identified little evidence on this subject and the evidence we identified was weak. One scoping review of aerosol generation in health care settings including dental offices concluded that dental hand pieces do generate aerosols and that a wide range of bacteria, fungi and viruses are contained in the aerosols. However, they noted only a few studies documenting infectious disease transmission as a result of aerosol generation. Also, a cohort study investigated levels of atmospheric microbial contamination before, during and after dental procedures and observed that contaminated aerosol levels increased four-fold during treatments compared to before treatments and remained elevated after work ceased, although less than during treatments.

We identified two other studies with indirectly related evidence that could further inform the subject of AGPs in dentistry. A systematic review investigating infection of health care workers when performing different tracheal manipulation treatments on patients with acute respiratory diseases such as SARS reported that tracheal intubation, ventilation techniques and tracheotomy all resulted in increased risk of infection for such workers. Also, a scoping review to summarize research concerning SARS-CoV-2 in water provided limited evidence but observed that the virus appears unstable in water, sensitive to higher water temperatures (23-25^{0}C and above) and does not appear to be transmitted through drinking water.

July to October update summary
We identified two systematic reviews with relevant subject matter published during the period July to October inclusive. One systematic review confirmed that SARS-Cov-2 is present in saliva and as well as sputum and the nasopharynx and concluded that saliva could be used to test for COVID-19 [88]. Another rapid systematic review was performed with the aim of classifying aerosol generating procedures (AGPs) [89]. They identified a list of procedures with strong agreement in the literature that they were AGPs. This list did not include dental procedures and the authors hypothesized that this non-inclusion of dental procedures is because they comprise a wide range of acts some of which are AGP and others are not [89]. This raises the important point that the dental professions need to identify AGPs versus non-AGPs within dental procedures and this needs to be based on sound principles and science. This is important because it has implications for the use of PPE and other interventions while performing dental procedures.

g. WHAT EVIDENCE EXISTS TO SUPPORT TRANSMISSION MITIGATION STRATEGIES DURING THE PROVISION OF IN-PERSON ORAL HEALTH CARE?

Why is this an important question?
Given the essential, physical closeness of oral health care professionals to their patients and sometimes to each other during the provision of oral health care, and the necessary generation of aerosols during some procedures, it is important to investigate alternative mitigation strategies that could be employed during treatment episodes. Particular focus has been on the use of pre-treatment mouth rinses, the use of rubber dam and the use of high-volume evacuation (HVE).

Summary of findings from original report (with references removed)
Several recently published systematic reviews on directly related subjects (i.e. dental care) were identified, although it is important to note that the research has focused more on bacteria or mixed microbes rather than viruses and in particular coronaviruses. We also identified several systematic reviews concerning the use of intra-oral chlorhexidine prior to other medical procedures. Clearly these are less directly relevant but nevertheless provide good supporting information.

Oral health-related research we identified focused on pre-treatment mouth rinses only. One systematic review showed that mouth rinses with chlorhexidine, essential oils, and cetylpyridinium chloride significantly reduced the number of colony-forming units. They concluded that there was moderate evidence that pre-treatment mouth rinses significantly reduce the number of micro-organisms in dental bioaerosols. And a second systematic review was performed to identify interventions used in dental treatment to reduce microbial load in aerosols. They concluded that 0.2% tempered chlorhexidine was most likely to be most effective in reducing postprocedural bacterial load.

Beyond the field of dentistry, one systematic review investigated the effect of oral antiseptic use on the risk of pneumonia in ventilated patients. They reported that oral chlorhexidine was effective in reducing the risk of ventilation-related pneumonia, while the effect of povidone iodine was not clear. Another systematic review of the effect of oral antiseptics on ventilation-related pneumonia in ventilated patients, also noted that they reduced the risk of pneumonia. Another systematic review investigated the effect of oral antiseptic on pneumonia and other nosocomial infections in patients undergoing cardiac surgery and reported the beneficial effect of oral chlorhexidine in reducing significantly the risk of pneumonia and other nosocomial infections in this patient group.

Finally, we note a Cochrane review protocol recently published concerning work that is highly relevant to this topic. The results of this work have not yet been published, nevertheless, the protocol describes a framework for considering infection control steps in dental clinics which is useful.

July to October update summary
As previously mentioned, we identified a systematic review confirming that SARS-Cov-2 is present in saliva and as well as in sputum and the nasopharynx [88]. This is important to consider in the context of this topic concerning mitigating strategies. We also identified several systematic reviews

published in the relevant period investigating a number of mitigating strategies during the provision of dental care and other health care procedures. A Cochrane review looked at a range of mitigating strategies including high volume evacuation, dental isolation combination systems, rubber dam and disinfectants, including disinfectant coolants [90]. The authors observed that all the studies included in their review investigated interventions' effects on colony forming units of bacteria, not viruses or respiratory disease transmission. They nevertheless concluded that there was probably benefit in using all the tested interventions but that the evidence to support them was weak [90]. Another Cochrane review investigated the potential protective effect against COVID-19 transmission of health care workers using antimicrobial mouthwashes and/or nasal sprays and identified no studies, although they did note a few relevant on-going randomized trials [91]. Another systematic review investigated the specific question "Does hydrogen peroxide mouthwash (at any concentration) have a virucidal effect?" and identified no research fulfilling their quality criteria addressing this question, thereby concluding that there is no evidence to support the use of hydrogen peroxide mouthwash to control viral load [92]. A rapid systematic review noted the possible beneficial effect of hypertonic saline nasal washes and mouth washes to mechanically reduce viral load and so potentially reduce risk of transmission from patients with COVID-19 to others [93]. Finally, another systematic review investigated the potential benefits of anti-microbial mouthwashes in managing COVID and found no clinical studies, only in vitro evaluations of chlorhexidine, povidone-iodine and C31G. The review noted that all these mouthwashes demonstrated reduced viral load in in vitro studies but recognized the lack of clinical evidence [94].

In summary, there remains no evidence concerning interventions to mitigate viral or COVID-19 transmission during dental treatments but there is good evidence supporting Chlorhexidine mouthwash reducing bacterial load (this was identified in the previous version of this report). Evidence for other interventions is weak and equivocal.

h. WHAT EVIDENCE EXISTS TO SUPPORT SPACE VENTILATION STRATEGIES THAT REDUCE THE RISK OF TRANSMISSION?

Why is this question important?

As previously mentioned, the potential transmission of COVID-19 by aerosols is an important question being investigated in this pandemic. Among potential approaches to address aerosol transmission is the use of ventilation strategies. This section summarizes the available evidence fulfilling our quality and subject area criteria, recognizing that this is a very broad area affecting the ventilation of all sorts of spaces that humans live and work in.

Summary of findings from original report (with references removed)

We identified one systematic review and one report of a combination of literature review and expert panel interpretation of the review results. Both papers were published prior to the current pandemic. The systematic review covered the period 2003-2017 investigated the concentration and composition of bioaerosols in hospitals with different ventilation systems. They reported that bioaerosol concentration levels were significantly higher in in-patient settings compared to restricted (e.g. operating rooms) and public areas. They also observed that hospital areas with natural ventilation had the highest concentration compared to areas with conventional mechanical ventilation or more sophisticated ventilation systems (including areas with increased air changes per hour, directional flow and filtration systems). They concluded that using sophisticated air ventilation systems in hospitals contributes to improved air quality and reduced risk of airborne transmission of diseases. The second review and expert panel group concluded that there is strong evidence for the association between building ventilation and the transmission of diseases such as influenza, SARS and others. However, there is insufficient data to specify ventilation requirements to reduce airborne spread of such diseases in hospitals, offices, homes and other sites.

July to October update summary

We identified one systematic review published in the relevant period and with pertinent information [90]. This Cochrane systematic review of multiple interventions to reduce aerosols during dental procedures reported one study with only two participants suggesting a stand-alone ventilation system may reduce aerosols during cavity preparation and ultrasonic scaler use [90]. It also reported another study with 50 participants suggesting laminar flow with a HEPA filter may reduce aerosols at 76cm from the floor and 20-30cm from a patient's mouth. However, they stated that no studies reported on viral contamination or disease transmission, rather they concerned bacterial contamination and the evidence was of low certainty [90].

i. WHAT EVIDENCE EXISTS TO SUPPORT THE DISINFECTION OF SURFACES IN SPACES IN WHICH ORAL HEALTH CARE IS PROVIDED?

Why is this question important?

While disinfection of the multiple fixed and mobile surfaces in dental offices and other dental professional settings is currently routine practice, it is important to review the available literature concerning such practices to ensure they are effective against all potential pathogens, including newly emerging ones such as SARS-CoV-2.

Summary of findings from original report (with references removed)

A 2006 systematic review summarized data concerning the persistence of nosocomial pathogens on inanimate surfaces. They concluded that most viruses that infect the respiratory tract, including SARS, influenza and coronaviruses can persist on surfaces for a few days and that several nosocomial pathogens including bacteria and fungi can remain viable for months if surface disinfection is not performed. Another, more recent systematic review of literature until March 2016 investigated the role of pathogens on hospital floors in human infections. They found that virtually all human pathogenic organisms could be found on floors and that aerosolization from the floor and direct contact could be responsible for transmission to humans. They concluded that effective cleaning of floors and vectors such as shoe soles is important.

In terms of the effectiveness of disinfection approaches for inanimate surfaces we identified a recent systematic review of the efficacy of disinfectant agents on a range of surface types in laboratory settings (i.e. *in vitro* testing) was published in 2020. The authors concluded that the effectiveness of chlorine and other forms of disinfectant varies according to the agent's concentration and the surface type being cleaned but also concluded that it is important for "field" studies (i.e. *in vivo* studies in health care settings) be performed to test the effectiveness of different agents on different surfaces.

Another systematic review investigated the factors that can affect the efficacy of disinfectant-impregnated wipes. The authors observed that these wipes are seeing increasing use in health care settings due to their convenience but that in such settings there are questions concerning their effectiveness. They concluded that the interaction between the disinfectant agent and the wipe material is an important factor in affecting the effectiveness of such wipes and that they should not be used in hospitals.

A systematic review was published in 2000 concerning of the knowledge, attitude and behaviour of oral health care workers regarding infection control procedures over the period of the 1980s and 1990s. They concluded that there had been substantial improvements in compliance with some areas of infection control procedures (e.g. glove use) but not in others (e.g. needle-stick injury). While not directly relevant to the COVID-19 pandemic and indeed pertains to a range of infection control procedures beyond surface disinfection, this review raises the issues of training in new infection-control measures among dental professionals and compliance with new protocols.

July to October update summary

We identified one additional systematic review covering surface disinfection published during this period [95]. This review investigated the use of surface decontamination against SARS-Cov-2 and against airborne pathogens and directly transmitted viral pathogens in dental settings. They found no evidence that fulfilled their quality criteria concerning SARS-Cov-2. However, they reported finding good quality evidence that 70% ethanol and 0.5% sodium hypochlorite used as surface disinfectants reduce the possibility of surface transmission of respiratory viruses. They recommended applying these disinfectants on surfaces for 1 minute to reduce the risk of contamination with SARS-Cov-2 [95].

It is important to note that Health Canada has lists of surface disinfectants and hand sanitizers that it states are supported by evidence and likely to be effective against SARS-CoV-2 (https://www.canada.ca/en/health-canada/services/drugs-health-products/disinfectants/covid-19/list.html#tbl1).

Glossary of abbreviations

Abbreviation	*Explanation*
AGP	Aerosol-generating procedures
CDC	Centers for Disease Control and Prevention
CFU	Colony-Forming Unit
CHX	Chlorhexidine
COVID-19	Coronavirus disease 2019
HVE	High-Volume Evacuation
H1N1	Influenza A
ICU	Intensive Care Unit
IgM	Immunoglobulin M
MERS	Middle East Respiratory Syndrome
PPE	Personal Protective Equipment
RCT	Randomized Controlled Trials
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus-2
SR	Systematic Review
TMD	Temporomandibular disorders
UVGI	Ultra-violet Germicidal Irradiation

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APPENDIX A: Key findings for topic a) patients at greater risk of the consequences of COVID-19.

Condition	Main findings	Source*
Strong evidence		
Cardiovascular disease	Higher risk for: (i) COVID-19 admitted in ICU (55% of 896 participants); odds: 3.11x greater Higher risk for: (i) severe COVID-19 (9.7% to 17.9%); odds: 3.0 to 4.6 x greater	SR and meta-analysis: *Abate SM et al.* [4]; *SR: Bennett et al.* [5]; SR and meta-analysis: *Hessami et al.* [6]; SR and meta-analysis: *Liu et al.* [7]; SR and meta-analysis: *N et al.* [8] ; SR and meta-analysis: *Meena et al.* [9]; SR and meta-analysis: *Qiu et al.* [10]; SR and meta-analysis: *Singh et al.* [11] ; SR and meta-analysis: *Wu et al.* [12]; SR and meta-analysis: *Yu et al.* [13]
	Higher chance of death: 19%; odds: 2.25 - 5.58 x greater	SR and meta-analysis: *Hessami et al.* [6]; SR and meta-analysis: *Yu et al.* [13];SR and meta-analysis: *Figliozzi et al.* [14]; SR and meta-analysis: *Pranata et al.* [15]; SR: *Shafi et al.* [17]
	Cardiac arrythmias: 16.6% to 19% patients with COVID-19.	SR and meta-analysis:2- *Pranata et al.* [16];
Hypertension	Higher risk for: (i) COVID-19 admitted in ICU (38% of 896 participants); odds:1.95- 2.40x greater	SR and meta-analysis: *Abate SM et al.* [4] SR and meta-analysis: *Hessami et al.* [6]; SR and meta-analysis: *Li et al.* [18];
	Higher risk for: (i) severe COVID-19 (17.4%- 43%); odds: 2.40 to 2.95x greater	SR: *Bennett et al.* [5]; SR and meta-analysis: *Di Carlo et al.* [19]; SR and meta-analysis: *Liu et al.* [7]; SR and meta-analysis: *N et al.* [8]; SR and meta-analysis: *Meena et al.* [9]; SR and meta-analysis: *Qiu et al.* [10]; SR: *Shafi et al.* [17]; SR and meta-analysis: *Singh et*

	Higher chance of death (odds: 2.60x greater) Cohort Study: 1150 adults were admitted to both hospitals with laboratory-confirmed COVID-19, 257 were critically ill: 162 presented hypertension (63%).	*al.* [11]; SR and meta-analysis: *Wu et al.* [12]; SR and meta-analysis: *Hessami et al.* [6]; Cohort Study: *Cummings et al.* [20]
Acute cardiac Injury	Higher chance of death (odds: 10.58 - 13.48x greater) Higher risk for admitted in ICU: odds 15.58 x greater Higher chance of death 15% Incidence 24.4% (542 of 2224 patients with COVID-19)	SR and meta-analysis: *Figliozzi et al.* [14]; SR and meta-analysis: *Hessami et al.* [6]; SR and meta-analysis: *Huang et al.* [21]; SR and meta-analysis: *Li et al.* [18]; SR and meta-analysis: *Potere et al.* [35]
Coronary heart disease	Higher chance of death (odds: 3.78x greater) Higher risk for: admitted in ICU: odds 2.61- 2.66x greater; Higher risk for: severe COVID-19 (3.8%)	SR and meta-analysis: *Hessami et al.* [6]; SR and meta-analysis: *Li et al.* [18]
Chronic obstructive pulmonary disease	Higher risk for: (i) severe COVID-19 (risk: less 4%; 1.9x- 5.8x) (ii) COVID-19 mortality (60% more)	SR: *Bennett et al.* [5]; SR and meta-analysis: *Li et al.* [18]; SR and meta-analysis: *Liu et al.* [7]; SR and meta-analysis: *Singh et al.* [11]; SR and meta-analysis: *Wu et al.* [12]
Acute Respiratory Syndrome	Higher risk for: (i) severe COVID-19: 33.15% to 34%; risk: 26.12x greater	SR and meta-analysis: *Huang et al.* [21]; SR and meta-analysis: *Khateri et al.* [22]; SR and meta-analysis: *Qiu et al.* [10]
Respiratory disease, general	Asthma: Higher chance of COVID-19 mortality (odds:0.96x greater)	SR and meta-analysis: *Wang et al.* [23]
Cancer	Higher chance of severe COVID-19: less 4%; odds: 2.17 to 2.2x greater for malignancies;	SR and meta-analysis: *Singh et al.* [11]; SR and meta-analysis: *Tian et al.* [44]

	Higher chance of mortality COVID-19: 20.83 to 25.6% (odds: 2.25 - 2.97x greater for malignancies) Higher chance for admitted in ICU: odds 2.88x greater Cohort Study: 319 (30·6%) of 1044 patients died, 295 (92·5%) of whom had a cause of death recorded as due to COVID-19. The all-cause case–fatality rate in patients with cancer after SARS-CoV-2 infection was significantly associated with increasing age (odds 0·10x greater 40–49 years; 0·48x greater 80 years and older). Cohort Study: 800 patients with a diagnosis of cancer and symptomatic COVID-19. 226 (28%) patients died and risk of death was significantly associated with: (I) advancing patient age (odds 9·42x) (ii) male (odds 1·67x) (iii) presence of comorbidities such as hypertension (odds: 1·95x) and cardiovascular disease (odds:2·32x)	SR and meta-analysis: *Cheruiyot et al.* [45]; SR and meta-analysis: *Salunke et al.* [46]; SR and meta-analysis: *Tian et al.* [44] SR and meta-analysis: *Salunke et al.* [46]; Cohort Study: *Lee et al.* [47] Cohort Study: *2. Lee et al.* [96]
Smoking, current	Association to severe (ICU): P =.003.	SR and meta-analysis: *Li et al.* [18];
Obesity	Cohort Study: 1150 adults were admitted to both hospitals with laboratory-confirmed COVID-19, 257 were critically ill: 119 presented obesity (46%). Higher chance of mortality COVID-19: 85.3%; odds: 0.17 - 3.93 x greater for obesity and age > 60 years; Odds: 1.84x greater for obesity and associate comorbidities.	Cohort Study: *Cummings et al.* [20]; SR and meta-analysis: *Du et al.* [40]; SR and meta-analysis: *Hussain et al.* [41]

	Higher risk for: (i) severe COVID-19 (odds: 3.11 x greater for obesity and age > 60 years); (ii) severe COVID-19: 56.2%; odds: 0.09 - 1.88 x greater for obesity.	SR and meta-analysis: *Du et al* [40]; SR and meta-analysis: *Malik et al.* [42]; SR and meta-analysis: *Sales-Peres et al.* [43]
Diabetes mellitus	The cumulative prevalence of diabetes in COVID-19 patients was 14.5%. As for diseases similar to COVID-19, the overall prevalence of diabetes was 54.4% in MERS, and for H1N1 influenza it was 14.6%. The mortality rate: 36% for MERS-Cov,, 6% SARS-Cov-1, 10% SARS-Cov-2. Higher risk for: (i) COVID-19 admitted in ICU (31% of 896 participants); odds: 3.17x Higher risk for: (i) severe COVID-19 (3.8%- 22.2%); odds: 1.32- 3.07x greater Higher chance of mortality COVID-19: 18%; odds: 2.12- 2.96 x greater Meta-analysis: severe COVID-19 was associated with higher blood glucose (odds: 2.10- 2.21 greater). Cohort Study: 1150 adults were admitted to both hospitals with laboratory-confirmed COVID-19, 257 were critically ill: 92 presented diabetes (36%).	SR and meta-analysis: *Abdi et al.* [24]; SR and meta-analysis: *Pinedo-Torres et al.* [25] SR and meta-analysis: *Abate SM et al.* [4]; SR and meta-analysis: *Li et al.* [18]; SR: *Bennett et al.* [5]; SR and meta-analysis: *Di Carlo et al.* [19]; SR and meta-analysis: *Liu et al.* [7]; SR and meta-analysis: *N et al.* [8]; SR and meta-analysis: *Qiu et al.* [10]; SR and meta-analysis: *Singh et al.* [11]; SR and meta-analysis: *Guo et al.* [26], SR and meta-analysis: *Huang I et al.* [21], SR: *Shafi et al.* [17] SR and meta-analysis: *Chen J et al.* [27]; SR and meta-analysis: *Mantovani et al.* [28]; Cohort Study: *Cummings et al.* [20]

Cerebro-vascular diseases	Higher risk for mortality (odds: 1.42 to 2.78x greater). 4% to 48.8% Higher COVID-19 severity (odds: 3.004x greater)	SR and meta-analysis: *Flores-Perdomo et al.* [48]; SR: *Ghannam et al.* [49]; SR and meta-analysis: *Li et al.* [18]; SR and meta-analysis: *MadaniNeishaboori, et al.* [50]; SR and meta-analysis: *Patel et al.* [51]; SR and meta-analysis: *Qiu et al.* [10]; SR: *Shafi et al.* [17]; SR and meta-analysis: *Singh et al.* [11]; SR and meta-analysis: *Wu et al.* [12]; SR and meta-analysis: *Yu et al.* [13]
Chronic kidney diseases	Higher COVID-19 severity 4% to 5.2%; odds 5.32x greater; Higher risk for mortality (odds: 1.84x greater).	SR and meta-analysis: *Kunutsor et al.* [32]; SR and meta-analysis: *N et al.* [8]; SR and meta-analysis: *Singh et al.* [11] SR and meta-analysis: *Wu et al.* [12]
Acute kidney injury	Higher risk for: (i) severe COVID-19 (6%- 11%); (ii) severe COVID-19 (odds: 8.11 to 18.5 x greater); (iii) mortality COVID-19 (odds: 14.63 to 23.9 x greater); Higher risk for mortality: (i) SARS : 86.6%; (ii) COVID-19: 67% - 94%; (iii)MERS: 68.5%. Higher chance of death (odds: 5.13 x greater)	SR: *Bennett et al.* [5]; SR and meta-analysis: *Cheruiyot et al.* [33]; SR and meta-analysis: *Huang et al.* [34] SR and meta-analysis: *Khateri et al.* [22]; SR and meta-analysis: *Kunutsor et al.* [32]; SR and meta-analysis: *Potere et al.* [35]; SR and meta-analysis: Robbins-Juarez *et al.* [36]; SR and meta-analysis: Shao *et al.* [37] SR and meta-analysis: *Oliveira et al.* [38]; SR and meta-analysis: *Ouyang et al.* [39]; SR and meta-analysis: *Figliozzi et al.* [14].
Liver diseases	Higher COVID-19 severity: odds 0.81x greater.	SR and meta-analysis: *Kulkarni et al.* [29]

	Higher chance of death: odds 1.78 to 3.46 x greater; Odds 1.48x greater for Chronic liver injuries Odds 1.68x greater for Acute liver injuries	SR and meta-analysis: *Kovalic et al.* [30] SR and meta-analysis: *Wu et al.* [12]; SR and meta-analysis: *Sharma et al.* [31]
Effect of age in COVID-19	Higher chance of death in patients aged 60 to 69 years compared with those aged 50 to 59 years (odds: 3.13x greater). Cohort Study: 1150 adults were admitted to both hospitals with laboratory-confirmed COVID-19: median age 62 years (IQR 51–72). 71.4% of the hospitalized older adults require supplementary oxygen.	Systematic Review and Meta-analysis: *Bonanad et al.* [52]; SR: *Ghannam et al.* [49] Cohort Study: *Cummings et al.* [20] SR: *Neumann-Podczaska et al.* [53]
Effect of sex difference in COVID-19	Higher COVID-19 incidence in men (meta-analysis: 50-66% of the studies); Higher COVID-19 severity: odds 1.46x greater for male; Higher chance of death: odds 1.32 - 1.81x greater; odds 1.69x greater pre-existing comorbidities. Meta-analysis factors which have an effect on sex difference in COVID-19: (I) Smoking: 75% male x 25% female (ii) Hypertension: 59.7% male x 40.3% female (iii)Diabetes: 71.1% male x 28.9% female (iv) Chronic respiratory disease: 79% male x 21% female (v) Cardiovascular disease: 81.7% male x 18.3% female	SR and meta-analysis: *Abate BB et al.* [54]; SR and meta-analysis: *Di Carlo et al.* [19]; SR and meta-analysis: *Qiu et al.* [10]; *SR and meta-analysis: Nasiri et al.* [55] SR and meta-analysis: *Ortolan et al.* [56] SR and meta-analysis: *Jutzeler et al.* [57]; SR and meta-analysis: *Ortolan et al.* [56] SR and meta-analysis: *Abate BB et al.* [54]

	(vi) Death: 78.8% male x 21.2% female Cohort Study: 1150 adults were admitted to both hospitals with laboratory-confirmed COVID-19: 171 (67%) male. Cohort study:1564 patients with COVID-19: 903 (57.7%) male vs 661 (42.3%) female.	 Cohort Study: *Cummings et al.* [20] Cohort study: *Hewitt et al.* [58]
Endocrine disorder	Higher risk for: (i) severe COVID-19 (9.3%)	SR: *Bennett et al. (* [5]
Vitamin D insufficiency	Cohort study: association with mortality from respiratory diseases during 15 years of 9548 adults aged 50–75 years: (I) 41% of respiratory disease mortality was statistically attributable to vitamin D insufficiency or deficiency.	Cohort Study: *Brenner et al.* [97] SR: *Galmes et al* [98]
Anaemia/iron metabolism/Ferritin level	(I) Increased ferritin rates in severe patients compared with the level in non-severe patients (odds: 397.77 to 563.98); (ii) Non-survivors had a significantly higher ferritin level compared with the one in survivors (odds: WMD 677.17). (iii) Patients with one or more comorbidities (Severe acute liver injury, diabetes, thrombotic complication, and cancer): significantly higher levels of ferritin than those without (*P* < .01).	SR and meta-analysis: *Cheng et al.* [99]; SR and meta-analysis: *Taneri et al.* [100]
Arterial Thrombosis/ Coagulopathy	Higher risk for mortality: (i) 20% of 52 patients; (ii) occurs in approximately 4% of critically ill COVID-19 patients. (iii) 6% of 999 patients	SR and meta-analysis: *Potere et al.* [35]
Acute cardiac Injury	Higher chance of death: 15.68%; odds: 10.58 x greater	SR and meta-analysis: *Figliozzi et al.* [14]
Limited evidence		

Nutrients deficiency	omega-3 fatty acids, vitamin A, vitamin D, vitamin E, vitamin B1, vitamin B6, vitamin B12, vitamin C, iron, zinc, and selenium: supplementation with these nutrients may be effective in improving the health status of patients with viral infections	SR: *BourBour et al.* [101]
Pregnancy: Women's and perinatal/neonatal health	Common complications maternal /foetal (156 patients): (i) intrauterine/foetal distress (14%); (ii) premature rupture of membranes (8-14.3%; (iii) 2.9% high risk for pregnant with COVID-19.	SR: *Akhtar et al.* [59]; SR and meta-analysis: *Diriba et al.* [60]; SR and meta-analysis: *Kotlyar et al.* [61] Cohort Study: *Tanacan et al.* [62]
	The neonatal clinical manifestations of COVID-19 (108 patients): (I) shortness of breath (6%) (ii) gastrointestinal symptoms (4%), (iii) fever (3%). Among 91 neonates who were tested, 8 (8.8%) were positive for nucleic acids or antibodies for SARS-CoV-2. Additionally, 28 (26.7%) of the neonates were symptomatic.	SR: *Akhtar et al.* [59] SR and meta-analysis: *Chi et al.* [63]
	~1%- 2.7% maternal death and 3 - 31.3% admissions to ICU; with intubation 3.4%; Neonatal and intrauterine deaths: 0.3%- 2.2%	SR and meta-analysis: *Diriba et al.* [60]; SR: *Huntley et al.* [64]; SR and meta-analysis: *Khalil et al.* [65]
	Vertical Transmission rate: 0% of 310; Meta-analysis: 936 neonates from mothers with coronavirus disease 2019, 27 neonates had a positive (2 to 3.2%) for vertical transmission.	SR: *Huntley et al.* [64] SR and meta-analysis: *Kotlyar et al.* [61]; SR: *Turan et al.* [66]
HIV	It is not clear if there is an increased risk of worse outcomes of COVID-19 for AIDS patients. Cohort Study: 63% with COVID-19 had at least one comorbidity (mostly	SR: *Cooper et al.* [102] Cohort Study: *Viscarra et al.* [103]

	hypertension and diabetes); 4% died.	

APPENDIX B – Key findings for topic b) clinical signs and symptoms of COVID-19

Sign/symptom	Frequency	Source
Strong evidence		
Fever	78 to 98%	SR and meta-analysis: *Meena et al. (9); Nasiri et al.* [55]; *Qiu et al.* [10]; SR: *Bennett et al.* [5];
Cough	22.4 to 78%	SR and meta-analysis: *Meena et al.* [9] ; *Nasiri et al.* [55]; *Qiu et al.* [10];
Dyspnea/shortness of breath	38.8% to 85.7%	SR and meta-analysis: *Qiu et al.* [10]
Myalgia or fatigue	22 to 65%	SR: *Almqvist et al.* [69]; SR and meta-analysis: *Di Carlo et al.* [19]; SR and meta-analysis: *Qiu et al.* [10];
Headache	8 to 14%	SR: *Almqvist et al.* [69]; SR: *Chen et al.* [70]; SR and meta-analysis: *Di Carlo et al.* [19]
Gastrointestinal symptoms	Higher chance of mortality COVID-19: 15%; odds: 0.91 x greater Abdominal pain: 6.2%	SR and meta-analysis: *Gul et al.* [71]; SR and meta-analysis: *Mao et al.* [72]; SR: *Meena et al.* [9]; SR and meta-analysis: *Tariq et al.* [68]
Diarrhea	12.4%	SR and meta-analysis: *Tariq et al.* [68]
Anosmia	39-88%	SR: *Almqvist et al.* [69]; SR: *Chen et al.* [70]; SR and meta-analysis: *Chua et al.* [73]; SR and meta-analysis: *Di Carlo et al.* [19]; *SR: Samaranayake et al.* [74]
Dysgesia	81.34%	SR: *Samaranayake et al.* [74]
Anorexia /loss of appetite	33.7%	SR: *Bennett et al.* [5]
Impairment of consciousness (also termed "confusion" or "agitation")	4.5 to 5.1% more frequently in severe or critical COVID-19 (11.9%) vs non-critical COVID-19 patients (3.2%)	SR: *Chen et al.* [70]
Others: seizures, stroke, Guillain-Barré syndrome	From 70 patients: (I) Stroke: 39 (53.4%) (ii) Guillain-Barre syndrome and variants: 18 (24.7%);	SR and meta-analysis: *Chua et al.* [73]

	(iii) meningitis, encephalitis, encephalopathy, or myelitis:11 (15.1%); (iv) seizures: 5 (6.8%).	
Dizziness	6.1%	SR and meta-analysis: *Di Carlo et al.* [19]
Myocardial Injury	16%	SR and meta-analysis: *De Lorenzo et al.* [75], *Li et al.* [67]
Children		
Fever	Common (53%)	SR and meta-analysis: *Zhang et al.* [76]
Cough	Common (39%)	SR and meta-analysis: *Zhang et al.* [76]
Sore throat/pharyngeal erythema	Common (14%)	SR and meta-analysis: *Zhang et al.* [76]
General considerations	18% of 551 cases were asymptomatic.	SR and meta-analysis: *Zhang et al.* [76]
Limited evidence		
Pregnant women		
Fever	Common (44%- 63.3%)	SR: Ashraf et al. [77]; SR and meta-analysis: *Diriba et al.* [60]; SR and meta-analysis: *Khalil et al.* [65];
Cough	Common (36.3%- 71.4%)	SR: Ashraf et al. [77]; SR and meta-analysis: *Diriba et al.* [60]; SR and meta-analysis: *Khalil et al.* [65]
Dyspnea	Common (12.7%- 34.4%)	SR: Ashraf et al. [77]; SR and meta-analysis: *Khalil et al.* [65]
Myalgia or fatigue	Common (11.4%)	SR and meta-analysis: *Diriba et al.* [60]
Severe pneumonia	Common (71-89%)	SR and meta-analysis: *Diriba et al.* [60]

APPENDIX C: Key findings for topic c) non disease-specific approaches to assist with non-treatment patient management measures for in-person oral health care.

Approach	Main findings	Source*
Limited evidence		
Dental office		
Before entering a Dental office	(I) Patient triage (identification of possible suspects); (ii) delay of non-urgent dental care; (iii) management of dental appointments; (iv) active screening of dental staff.	*SR: Banakar et al.* [78]; *Cabrera-Tasayco et al.* [79]; *Siles-Garcia et al.* [80] *Al-Halabi et al.* [81];
At the Dental office	(I) Active screening of patients (the temperature of the patient should be taken); (ii) management of social distancing in the dental office; (iii) offering sanitation measures to the patients; (iv) use of facemasks by everyone entering the dental office, patient education, use of PPE by the dental team; (v) management of dental operatory room are among the procedures required to be carried out in dental offices;	*SR: Banakar et al.* [78]; *Cabrera-Tasayco et al.* [79]; *Al-Halabi et al.* [81]; *Siles-Garcia et al.* [80];
Post dental treatment	(I) Cleaning and disinfecting reusable facial protective equipment, Non-disposable equipment (e.g., handpieces) and surfaces; (ii) management of laundry and waste according the type.	*SR: Banakar et al.* [78]; *Cabrera-Tasayco et al.* [79]; *Al-Halabi et al.* [81]; *Siles-Garcia et al.* [80]
Frequent handwashing	break the transmission cycle of respiratory diseases and reduce the risk of transmission by 6 to 14%	SR: *Siles-Garcia et al.* [80]
Level of PPE		
Masks or respirators worn by health care professionals	Little evidence supporting a use of masks with pores of less	*SR: Banakar et al.* [78]

	than 50 µm is necessary for dental professionals. Little evidence supporting a use of different garments to enhance biosecurity: disposable surgical cap, breathing mask (N95 or FFP2), disposable long-sleeved gown with elasticized wrist cuffs, lenses, facial visor, disposable gloves, and boots.	 *SR: Cabrera-Tasayco et al.* [79]
Specific settings, general precautions		
Long-term care settings	Little evidence supports that Disinfectants such as 0.1-0.5% sodium hypochlorite, 62-71% ethanol, or 2% glutaraldehyde can be used for surface decontamination, as well as 62% ethanol or 2% glutaraldehyde in freshly prepared solutions and adequate concentrations.	*SR: Cabrera-Tasayco et al.* [79]
Dental laboratories	Little evidence supports a disinfection method should be used for any material extracted from the mouth and sent to the laboratory to prevent cross-contamination.	*SR: Cabrera-Tasayco et al.* [79]

APPENDIX D: Key findings for topic d) PPE for providing in-person healthcare.

Approach	Main findings	Source*
Limited evidence for COVID-19 (including strong evidence for other diseases)		
Risk factors for HCW	Associated with transmission of SARS-CoV-2: (I) Scarcity of PPE: 42.5% (ii) Inadequate PPE and hand hygiene: 14.2% (iii) Improper PPE: odd 2.82 greater for risk of contamination. Prolonged PPE usage (more than 6 h of continuous PPE use and more than 10 times/day hand hygiene): (I) cutaneous manifestations and skin damage (97%): -nasal bridge (N95 face mask and/or goggle (83%); -dryness/tightness (70.3%); -desquamation (62.2%). Use prolonged of respirators by dental professionals was associated: (I) headaches (47.5%); (ii) severe exertion and discomfort (50.8%); (iii) moderate concentration problems (54.3%); (iv) moderate breathing difficulties (63.5%); (v) impaired work ability (85.5%).	SR: *Sant'Ana et al.* [104]; Scoping Review: *Shaukat et al.* [85] Scoping Review: *Shaukat et al.* [85] Scoping Review*: Farronato et al.* [105]
Face shields and eye protection	Could effectively reduce the risk of inhalation of over 90% expelled particulate matter following aerosol generation; transmission of SARS-CoV-2 through the conjunctive in an	SR: *Samaranayke et al.* [84]

	HCW who was wearing only a protective N95 respirator.	
Respirators	Among 256 dentists the prolonged use was associated with: (I) headaches (47.5%) (ii) severe exertion and discomfort (50.8%) (iii) moderate concentration problems (54.3%) (iv) moderate breathing difficulties (63.5%) (v) impaired work ability (85.5%)	Scoping Review: *Farronato et al.* [105]
Cloth masks	Presence of filtration in evaluated fabrics: (i) Hybrid of cotton/chiffon: 95.2 to 98.8% of efficiency; (ii) hybrid of cotton/silk: 92.2 to 95.8% of efficiency; (iii) cotton quilt: 94.2 to 97.8% of efficiency. Not recommended for HCW.	SR: *Santos et al.* [87]
N95 masks vs surgical masks	N95 respirators were the favorite in all scenarios, except: (I) when performing non-AGP medical procedures on symptomatic patients: favored surgical masks; (ii) when performing AGP medical procedures on COVID positive patients: favored N99 respirators. N95 respirators offered better protection compared with the surgical masks, for (bacterial) particles 20 lm in diameter where efficiency estimates ranged from 2% to 92%	SR: *Zhang et al* [83] SR: *Samaranayke et al.* [84]
Powered air-purifying respirator (PAPR)	Limited literature supporting the PAPR use during epidemics/pandemics of SARS-CoV-1, SARS-CoV-2, MERS, and Ebola.	SR: *Licina et al.* [82]

APPENDIX E: Key findings for topic e) decontamination and re-use of PPE.

Approach	**Main findings**	**Source***
Limited evidence		
N95 respirators		
Microwave	*Microwave-generated steam*: (I) 90 seconds, 3 cycles: 65% of aerosol penetration reduction through N95; (ii) 120 seconds, 1 cycle: 65%of aerosol penetration reduction through N95; (iii) 45- 90 seconds, 1 cycle: log10 viral reduction factor for Escherichia virus MS2; (iv) 120 seconds, 1 cycle: log10 viral reduction factor for H1N1. (v) 120 seconds, 3 cycles: ≥ 90% fit pass rate for all models. (vi) Physical traits: slight separation of nose cushion from model 3M1870 (N=4); Melting of strap on models KCPFR 174 and KCPFR 95-270. *Dry Microwave*: (I) 120-240 seconds, 1 cycle: 25% of aerosol penetration reduction through N95; (ii)120 seconds, 1 cycle: 85% of aerosol penetration reduction through N95; (iii) Physical traits: Melting of model 3M 8000 after 240 seconds and 3M1870 after 120seconds.	SR: *Gertsman et al.* [86]
Moist Heat Incubation	(I) 30min, 60C, 3cycles: 74% of aerosol penetration reduction through N95; (ii) 20 min, 65C, 1 cycle: 72% of aerosol penetration reduction through N95; (iii) ≥ 90% fit pass rate for all models. (iv) Physical traits: slight separation of nose cushion from model 3M1870 (N=3);	SR: *Gertsman et al.* [86]

Dry Heat	(I) 60 min, 80C, 1 cycle: 86% of aerosol penetration reduction through N95; (ii) 60 min, 80-120C, 1 cycle: 34% of aerosol penetration reduction through N95; (iii) 60 min or more , 70C, 1 cycle: log10 viral reduction factor for SARS-Cov-2; (iv) Fit factor > 100 for all models, after 2 heat cycles; (v) Physical traits: Melting of some models at temperature ≥ 100C (KCPFR 95-270 and 3M 8000) but no changes at lower temperature.	SR: *Gertsman et al.* [86]
Autoclave	(I) 15-30min,121C, 1 cycle: odd: 25.85 of aerosol penetration reduction through N95; (ii) Fit factor > 100 for most models, after 10 cycles. (iii) Physical traits: Masks deformed, shrunken and stiff (models 3M 8000 and 3M 8210).	SR: *Gertsman et al.* [86]

APPENDIX F: Key findings for topic f) the provision of aerosol-generating procedures (AGP)

Condition	Main findings	Source*
Limited evidence in relation to COVID-19/SARS-CoV-2		
Saliva contamination	SARS-CoV-2 was detected in saliva specimens in aproximatelly 90-95% of patients.	SR: *Fakheran et al.* [88]
Limited evidence for SARS, MERS, H1N1, Influenza and bacteria		
Consensus of AGP procedures generating	(i) intubation and extubation procedures: 100% (ii) bronchoscophy: 94% (iii)oral and dental procedures: 78%	SR: *Jackson et al.* [89]

APPENDIX G: Key findings for topic g) mitigation strategies (e.g. rubber dam, mouth rinses etc.) during the provision of in-person oral health care.

Intervention	Main findings*	Source*
Limited evidence in Dental Procedures		
High-volume evacuator	(i) The use reduces bacterial contamination in aerosols: less than one foot (~ 30 cm) from a patient's mouth (odds 2.06 greater); but not in longer distances (44% of reduction). (ii) The use may not be more effective than conventional dental suction (saliva ejector or low-volume evacuator) at 40 cm (28% of reduction of bacteria).	SR: *Kumbargere et a*l. [90]
Dental isolation combination system (Isolite) and a saliva ejector low-volume evacuator)	(i) During AGPs procedures: 80% of CFU reduction; (ii) After AGPs procedures: 71% of CFU reduction;	SR: *Kumbargere et a*l. [90]
Rubber dam of rubber dam may make no difference in CFU at the) and occipital region of the operator (MD 0.77, 95% CI −0.46 to 2.00).	During dental treatment: (i) With Rubber Dam at one-metre (odd: 13.04 reduction in CFU); (ii) With Rubber Dam at the forehead (odd: 2.70 reduction in CFU); (iii) With rubber dam + HVE may reduce CFU more than cotton roll plus HVE on the patient's chest (odd: 234.05 reduction in CFU) and dental unit light (odd: 12.55 reduction in CFU).	SR: *Kumbargere et a*l. [90]
Mouth Rinse solutions		
Hydrogen Peroxide	***In Medical Procedures:***	SR: *Ortega et al.* [92]

	Little scientific evidence to support any virucidal activity, including against SARS-CoV-2, because of the lack of substantivity.	
Hypertonic Saline	***In Medical Procedures:*** Nasal irrigation: 35% of viral shedding in ICU; positive effects in acute sinusites.	SR: *Singh et al.* [93]
Oral Rinse Chlorhexidine (CHX)	***In Dental Procedures:*** Before dental procedures: lesse effective than Polvidine in eliminating COVID-19. During ultrasonic scaling: odd 122.22 of CFU reduction. ***In Medical Procedures:*** Before gargling undergoing ventilation to prevent pneumonia (29% bio-aerosol reductions).	SR: *Moosavi et al.* [94] SR: *Kumbargere et al.* [90] SR: *Singh et al.* [93]
Herbal rinse	**In medical procedures:** Before gargling presented 85% less incidence of Influenza in elderly people.	SR: *Singh et al.* [93]
Povidine-Iodine	***In Dental Procedures:*** During ultrasonic scaling: odd 640.16 of CFU reduction. ***In Medical Procedures:*** No studies for COVID-19 Before gargling presented 36% positive effect in ICU. Before gargling presented reduction of viral load against enveloped viruses; MERS-CoV, SARS-CoV and Influenza H1N1 presented reduction of viral tires (4.40-6.00 log10 TCID\50ml).	SR: *Kumbargere et al.* [90] SR: *Burton et al.* [91] SR: *Singh et al.* [93] SR: *Moosavi et al.* [94]

APPENDIX H: Key findings for topic h) space ventilation strategies to reduce the risk of transmission

Ventilation setting	Main findings	Source*
Limited evidence in relation to SARS-CoV and MERS-CoV and microorganisms		
Air cleaning systems in Dental office	Using a local stand-alone air cleaning system (ACS):(i) during cavity preparation (odd: 13.25 of reduction of AGP per cubic metre); (ii) using ultrasonic scaling (odd: 13.25 of reduction of AGP per cubic metre). Using a laminar flow in the dental clinic combined with a HEPA filter: (i) reduce contamination approximately 76 cm from the floor (odd: 417.10 of reduction of CFU per cubic feet per minute per patient); (ii) reduce contamination approximately 20 cm to 30 cm from the patient's mouth (odd: 252.68 of reduction of CFU per cubic feet per minute per patient).	SR: *Kumbargere et al.* [90]

APPENDIX I: Key findings for topic i) disinfection of surfaces in spaces in which oral health care is provided

Approaching/Intervention	**Main findings**	**Source***
Limited evidence in relation to different virus		
Disinfectants	**Chlorine** Viral disinfection on different surfaces: (i) Plastics: >2.78 log TCID 50/ml reduction of Influenza A \ H1N1 (ii) Stainless Steel: >3 log TCID 50/ml reduction of HCov 229E; >3 log TCID 50/ml reduction of parainfluenza virus; >3 log TCID 50/ml reduction of Type 5 Adenovirus.	SR: *Barbato et al.* [95]
	Alcohols Viral disinfection of different surfaces: (i) Plastics: >2.78 log TCID 50/ml reduction of Influenza A \ H1N1 (ii) Stainless Steel: >4log TCID 50/ml reduction of Adenovirus; >3 log TCID 50/ml reduction of HCov 229E; >3 log TCID 50/ml reduction of parainfluenza virus; >3 log TCID 50/ml reduction of Type 5 Adenovirus.	SR: *Barbato et al.* [95]
	Peracetic Acid Viral disinfection of different surfaces: (i) Stainless Steel: >4log TCID 50/ml reduction of Adenovirus (ii) Glass: >4log TCID 50/ml reduction of Adenovirus	SR: *Barbato et al.* [95]
	Glutaraldehyde Viral disinfection of different surfaces:	SR: *Barbato et al.* [95]

	(i) Stainless Steel: >4log TCID 50/ml reduction of Adenovirus and >3 log TCID 50/ml reduction of HCov 229E; >3 log TCID 50/ml reduction of parainfluenza virus; >3 log TCID 50/ml reduction of Type 5 Adenovirus.	
	Povidone- Iodine Viral disinfection of different surfaces: (i) Stainless Steel: >4log TCID 50/ml reduction of Adenovirus and <3 log TCID 50/ml reduction of HCov 229E; >3 log TCID 50/ml reduction of parainfluenza virus; <3 log TCID 50/ml reduction of Type 5 Adenovirus.	SR: *Barbato et al.* [95]

APPENDIX J: Methods used to identify and include relevant literature

This report was structured as a rapid review of the evidence to support safe provision of oral health care during the COVID-19 pandemic. Different search strategies were tailored for nine key areas ("a" to "i"); available evidence was divided according to those key areas.

J.1. Eligibility criteria

J.1.1. Study types and design

Besides studies in the field of COVID-19/SARS-CoV-2, we also included studies on closely related respiratory viruses, comprising SARS, MERS, H1N1, influenza and common cold. Eligible study designs were: systematic reviews (SR), scoping reviews, randomized controlled trials (RCT) and prospective cohort studies. We considered only manuscripts written in English as potential sources of study data.

The paucity of literature on SARS-CoV-2 infection control has led us to extend inclusion criteria for key areas "f", "g", "h" and "i". Therefore, studies related to airborne bacterial contamination were also included for those areas.

J.1.2. Types of conditions and interventions

Each key review area approached a distinct set of conditions and/or interventions of relevance for oral health care. In brief, those were conditions leading to higher risk of morbidity or mortality by COVID-19, approaches to protect healthcare professionals and patients from infection in different moments (i.e. physical distancing, aerosol-generating procedures, asepsis/disinfection and PPE). We expect conditions and interventions of relevance for the viruses mentioned above to be potentially relevant for COVID-19/SARS-CoV-2, even if as with poorer generalizability – studies reporting them would be considered as weaker sources of evidence.

Specific conditions and interventions were:

a. Comorbidities and other health conditions able to increase the risk of COVID-19-related complications, including death;
b. Clinical signs and symptoms expected with COVID-19 and observable by dental professionals before rendering in-person care;
c. Non-treatment approaches to provide in-person dental care, including patient scheduling, waiting and others (e.g., teledentistry-based interventions);
d. Different PPE for in-person dental care, based on studies from different areas of health (not restricted to dental professions);
e. Decontamination of PPE, aiming at their possible reuse;
f. Aerosols generated by dental procedures, and their relevance for the transmission of COVID-19;
g. Methods to mitigate cross-infection by aerosols during in-person provision of oral health care, including rubber dam and pre-operatory mouthwashes;
h. Spatial ventilation strategies to reduce the risk of transmission;
i. Disinfection of surfaces where oral health care is provided.

Since, at the time of preparing this review, there is no available vaccine for COVID-19, we have not considered that kind of intervention. We did not include prophylactic antiviral regimens for the same reason, for either patients or health care professionals. Since there is potential for vaccines and antivirals to become parts of dental professionals' routine after their development, we may consider including them in future updates.

J.1.2. Outcomes

This review considered any outcome related to the severity of COVID-19 as relevant, including signs/symptoms, complications and incident comorbidities, disease-specific severity indexes, and survival/death. Whenever relevant, measures of contamination (e.g., % contaminated per group, or microbial counts on disinfected surfaces) and adverse effects (e.g., rash caused by prolonged mask wearing) were considered.

Whenever relevant for each study key area, a brief description of patient and professional perception was provided. This would be done quantitatively (by numbers, e.g., % of dentists who disinfect impressions before sending to the laboratory) or qualitatively (by a concise narrative of key perceptions).

J.2. Search strategy

J.2.1. Electronic searches

We performed systematic literature searches separated by key areas in the following databases: CINAHL, Embase (Ovid), MEDLINE (Ovid) and SCOPUS, restricting our search to a period of 4 months (July 1st 2020 to October 31st 2020). Different search strategies were prepared for key areas "a" to "i" and adapted for each database. Given their similar nature, some pairs of key areas employed a single search (i.e, "a"+"b"; "c"; "d"+"e"; "f"+"g"; "h" and "I"), totalling six searches.

Please refer to Table J1 at the end of this Appendix for the terms used in the electronic searches.

J.2.2. Researching other resources

We reviewed the list of references of all papers included in the report to identify other potentially relevant studies ("reference mining").

J.3. Data collection and analysis

J.3.1. Selection of studies

Two researchers (L.A. and R.S.) examined the titles and abstracts from each search to decide on their exclusion. A third researcher (P.A.) tackled any disagreement between the two reviewers during the selection of titles and abstracts.

Potential inclusion (including cases of insufficient information for exclusion) led to the revision of full text versions by two researchers (R.S. and P.A.). For full text selection, any disagreement was decided by a consensus meeting with a third researcher (L.A.). Although we always reached consensus, the third researcher would have the final decision in cases of persisting disagreement.

In the case of having two or more manuscripts describing the same study, those references would count as a single included study.

J.3.2 Data extraction/management, and quality of studies

Studies were classified according to the level of evidence provided: SR>RCT>prospective cohort. Scoping reviews were considered due to the breadth of information rather than strength of evidence. Since this is a rapid review on a vast amount of key areas, no in-depth quality assessment was performed – instead, we classified sources of evidence as "strong", "limited" or "none" for each specific condition/intervention.

J.3.2.1 Eligibility Criteria for Key areas A and B

Our search yielded several redundant studies for key areas A and B. That led us to restrict our eligibility criteria, by including only systematic reviews. As decision criteria for inclusion, this report considered as a systematic review just those studies with:

(a) a well-defined goal and/or research question, based on participant/patient type, exposure and outcome variables;

(b) systematic study selection, by using reproducible methods (including clear search strategy and eligibility criteria);

(c) quality assessment of reviewed literature (e.g., application of standard quality assessment questionnaires for clinical studies);

(d) any strategy to synthetize obtained data (including meta-analysis) or at least a critical description primary study data, if studies cannot be pooled.

Primary studies for key area A were restricted to prospective ones. This enabled us to focus on high-level evidence. The latter restriction was not applied to key area B, given the non-analytical nature of the question.

Scoping reviews and other primary studies, including retrospective cohort, were still eligible for key areas C to I. Thus, broader information was reviewed for those areas with more scarce evidence.

J.2. Description of studies

J.2.1. Results of the search

The search strategy retrieved 6,263 study titles and abstracts. After examining those references, 6,054 clearly did not meet the inclusion criteria and were excluded. Two hundred and nine full text reports of potentially relevant studies were obtained for further evaluation. After excluding 100 full reports, our sample totaled 102 study reports.

According to each section, articles were included. Appendix Table J2 shows the selection of the publication for inclusion in the systematic review.

Appendix Table J2. Yield of the six electronic search strategies, in terms of the number of reports.

Key areas	**Total**	**Excluded**	**Included**
A + B	690	608	*82 (11.8%)*
C	3,558	3,554	4 *(0.1%)*
D + E	618	610	*8 (1.3%)*
F + G	829	822	*7 (0.8%)*
H	73	72	1 *(1.4%)*
I	488	487	*1 (0.2%)*
			Total = 103

* There were several articles identified for more than one topic (for instance, 7 articles were identified for topics A and B) hence the total in the table (103 included articles) is slightly greater than the 102 articles in the reference list.

J.2.2. Included Studies

Most included studies were published in the last 10 years. All the reports were published between August and October 2020. Regarding study design, the majority of our inclusions were SR (n=100, 92%). We have also included seven scoping reviews (n=2, 2%), as well seven prospective cohort study (6%).

J.2.3. Measures of treatment effect and Unit of analysis issues

Included studies underwent qualitative analysis and separate data extraction, without further efforts for quantitative synthesis. Please refer to the main document and Appendices A to I for the description and results of included studies.

Appendix Table J1. Search strategies used for each key area of the present report.

Key areas A and B

1. exp Severe Acute Respiratory Syndrome/
2. "severe acute respiratory syndrome coronavirus 2".mp.
3. (2019 ncov or 2019nCoV or "covid 19" or "sars cov 2" or covid-19).mp.
4. coronavirus/ or exp betacoronavirus/
5. or/1-4
6. exp Risk Factors/
7. exp Risk Assessment/
8. (risk? adj3 (at or assess* or factor?)).tw,kf.
9. (complication? or mortality or sequela? or comorbid* or consequence?).tw,kf.
10. or/6-9
11. 5 and 10
12. meta-analysis.pt.
13. meta-analysis/ or systematic review/ or meta-analysis as topic/ or "meta analysis (topic)"/ or "systematic review (topic)"/ or exp technology assessment, biomedical/
14. ((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab,kw.
15. ((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab,kw.
16. ((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab,kf,kw.
17. (data synthes* or data extraction* or data abstraction*).ti,ab,kf,kw.
18. (handsearch* or hand search*).ti,ab,kf,kw.
19. (mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab,kf,kw.
20. (met analy* or metanaly* or technology assessment* or HTA or HTAs or technology overview* or technology appraisal*).ti,ab,kf,kw. 21. (meta regression* or metaregression*).ti,ab,kf,kw.
22. (meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.
23. (medline or cochrane or pubmed or medlars or embase or cinahl).ti,ab,hw.
24. (cochrane or (health adj2 technology assessment) or evidence report).jw.
25. (comparative adj3 (efficacy or effectiveness)).ti,ab,kf,kw.
26. (outcomes research or relative effectiveness).ti,ab,kf,kw.
27. ((indirect or indirect treatment or mixed-treatment) adj comparison*).ti,ab,kf,kw.
28. or/12-27
29. Epidemiologic Studies/ or exp Case Control Studies/ or exp Cohort Studies/
30. (case control or (cohort adj (study or studies)) or cohort analy$ or (follow up adj (study or studies)) or longitudinal or retrospective or cross sectional).tw.
31. Cross-Sectional Studies/
32. or/29-31
33. 28 or 32
34. 11 and 33
35. limit 62 to last 25 years

Key area C

1. exp Stomatognathic Diseases/
2. exp Dentistry/
3. exp Oral Health/
4. exp Dental Facilities/
5. (dentist* or endodont* or orthodo
nti* or periodont* or prosthodont* or apicoectom* or gingivectom* or gingivoplast* or glossectom* or "mandibular advancement" or alveolectom* or alveoloplast* or vestibuloplast* or "root canal" or oral or oropharyng* or temporomandibular or TMJ or jaw or jaws or mandibular or maxillofacial or mandible* or maxilla* or "alveolar ridge" or dental or orthognathic or tooth or teeth or occlusion or malocclusion or mal-occlusion or odontolog* or tongue* or glossal or buccal or palatal or palate or palates or labial or lip or lips or gingiva* or gingiviti*).tw,kw.
6. or/1-5
7. exp Viruses/
8. exp Virus Diseases/
9. (viridae or COVID-19 or AIDS or HIV or ebola or zika or "west nile" or shingles or SARS or MERS or chickenpox or smallpox or Chikungunya or epstein-barr or erythema or exanthum or influenza? or flu or HFMD or "heartland virus" or HFRS or hepatitis or herpes or cmeasles or mumps or "nipah virus" or Poliomyelitis or yersiniosis or rubella or salmonellosis or rabies).tw,kw.
10. (aalivirus* or ab18virus* or abouovirus* or abyssovirus* or acadianvirus* or ag3virus* or agatevirus* or agrican357virus* or aichivirus* or albetovirus* or alefpapillomavirus* or alfamovirus* or allexivirus* or allolevivirus* or almendravirus* or alpha3microvirus* or alphaabyssovirus* or alphaarterivirus* or alphabaculovirus* or alphacarmotetravirus* or alphacarmovirus* or alphacoronavirus* or alphaendornavirus* or alphaentomopoxvirus* or alphafusellovirus* or alphaguttavirus* or alphaherpesvirus* or alphainfluenzavirus* or alphaletovirus* or alphamesonivirus* or alphamononivirus* or alphanecrovirus* or alphanodavirus* or alphanudivirus* or alphapapillomavirus* or alphapartitivirus* or alphapermutotetravirus* or alphapleolipovirus* or alphapolyomavirus* or alphaportoglobovirus* or alpharetrovirus* or alphasphaerolipovirus* or alphaspiravirus* or alphatectivirus* or alphatorquevirus* or alphatristromavirus* or alphaturrivirus* or alphavirus* or amalgavirus* or ambidensovirus* or amdoparvovirus* or amigovirus* or ampelovirus* or ampivirus* or ampobartevirus* or ampullavirus* or anatolevirus* or andecovirus* or andromedavirus* or anphevirus* or anulavirus* or ap22virus* or aparavirus* or aphthovirus* or aplyccavirus* or aquabirnavirus* or aquamavirus* or aquaparamyxovirus* or aquareovirus* or arlivirus* or arv1virus* or ascovirus* or asfivirus* or atadenovirus* or attisvirus* or aumaivirus* or aureusvirus* or aurivirus* or avastrovirus* or avenavirus* or aveparvovirus* or aviadenovirus* or avibirnavirus* or avihepadnavirus* or avihepatovirus* or avipoxvirus* or avisivirus* or avulavirus* or b4virus* or

babuvirus* or bacillarnavirus* or badnavirus* or bafinivirus* or balbicanovirus* or banyangvirus* or barnavirus* or barnyardvirus* or bastillevirus* or batrachovirus* or baxtervirus* or bc431virus* or bcep22virus* or bcep78virus* or bcepmuvirus* or bdellomicrovirus* or becurtovirus* or begomovirus* or behecravirus* or beidivirus* or benyvirus* or berhavirus* or bernal13virus* or betaarterivirus* or betabaculovirus* or betacarmovirus* or betacoronavirus* or betaendornavirus* or betaentomopoxvirus* or betafusellovirus* or betaguttavirus* or betaherpesvirus* or betainfluenzavirus* or betalipothrixvirus* or betanecrovirus* or betanodavirus* or betanudivirus* or betapapillomavirus* or betapartitivirus* or betapleolipovirus* or betapolyomavirus* or betaretrovirus* or betasphaerolipovirus* or betatectivirus* or betatetravirus* or betatorquevirus* or beturrivirus* or bevemovirus* or bicaudavirus* or bidensovirus* or bignuzvirus* or biquartavirus* or biseptimavirus* or blosnavirus* or blunervirus* or bocaparvovirus* or bolenivirus* or bongovirus* or bopivirus* or bostovirus* or botrexvirus* or botybirnavirus* or bovismacovirus* or bovispumavirus* or bpp1virus* or bracovirus* or brambyvirus* or brevidensovirus* or bromovirus* or bronvirus* or brujitavirus* or buldecovirus* or buttersvirus* or bxz1virus* or bymovirus* or c2virus* or c5virus* or cadicivirus* or cafeteriavirus* or calicivirus* or camvirus* or capillovirus* or capripoxvirus* or capulavirus* or carbovirus* or cardiovirus* or cardoreovirus* or carlavirus* or casualivirus* or caulimovirus* or cavemovirus* or cba120virus* or cba181virus* or cba41virus* or cbastvirus* or cc31virus* or cd119virus* or cecivirus* or cegacovirus* or centapoxvirus* or cervidpoxvirus* or charlievirus* or charybnivirus* or che8virus* or che9cvirus* or cheravirus* or chibartevirus* or chipapillomavirus* or chipolycivirus* or chivirus* or chlamydiamicrovirus* or chloriridovirus* or chlorovirus* or chordovirus* or chrysovirus* or cilevirus* or circovirus* or citrivirus* or cjw1virus* or clavavirus* or closterovirus* or coccolithovirus* or colacovirus* or coltivirus* or comovirus* or coopervirus* or copiparvovirus* or corndogvirus* or coronavirus* or corticovirus* or cosavirus* or cosmacovirus* or cp1virus* or cp220virus* or cp51virus* or cp8virus* or cr3virus* or cradenivirus* or crinivirus* or cripavirus* or crocodylidpoxvirus* or crohivirus* or cronusvirus* or crustavirus* or cryspovirus* or cucumovirus* or cuevavirus* or curiovirus* or curtovirus* or cvm10virus* or cyclovirus* or cypovirus* or cyprinivirus* or cystovirus* or cytomegalovirus* or cytorhabdovirus* or d3112virus* or d3virus* or debiartevirus* or decacovirus* or decronivirus* or decurrovirus* or deltaarterivirus* or deltabaculovirus* or deltacoronavirus* or deltaflexivirus* or deltainfluenzavirus* or deltalipothrixvirus* or deltapapillomavirus* or deltapartitivirus* or deltapolyomavirus* or deltaretrovirus* or deltatorquevirus* or deltavirus* or 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gammatorquevirus* or gemycircularvirus* or gemyduguivirus* or gemygorvirus* or gemykibivirus* or gemykolovirus* or gemykrogvirus* or gemykroznavirus* or gemytondvirus* or gemyvongvirus* or giardiavirus* or gilesvirus* or globulovirus* or glossinavirus* or goravirus* or gordonvirus* or gordtnkvirus* or goukovirus* or grablovirus* or granulovirus* or gyrovirus* or habenivirus* or hanalivirus* or hapavirus* or hapunavirus* or harkavirus* or harrisonvirus* or hartmanivirus* or hawkeyevirus* or hedartevirus* or hemivirus* or henipavirus* or hepacivirus* or hepandensovirus* or hepatovirus* or herbevirus* or herdecovirus* or herpesvirus* or hibecovirus* or higrevirus* or hk578virus* or hk97virus* or hordeivirus* or horwuvirus* or hp1virus* or hubavirus* or huchismacovirus* or hudivirus* or hudovirus* or hunnivirus* or hupolycivirus* or hypovirus* or hytrovirus* or ichnovirus* or ichtadenovirus* or ictalurivirus* or idaeovirus* or idnoreovirus* or iflavirus* or igacovirus* or ilarvirus* or iltovirus* or infratovirus* or inovirus* or inshuvirus* or invictavirus* or iotaarterivirus* or iotapapillomavirus* or iotatorquevirus* or ipomovirus* or iridovirus* or isavirus* or iteradensovirus* or jd18virus* or jenstvirus* or jerseyvirus* or jimmervirus* or jonvirus* or js98virus* or jwalphavirus* or jwxvirus* or k1gvirus* or kadilivirus* or kaftartevirus* or kappaarterivirus* or kappapapillomavirus* or kappatorquevirus* or karsalivirus* or kayvirus* or kelleziovirus* or kf1virus* or kieseladnavirus* or kigiartevirus* or kobuvirus* or korravirus* or kp15virus* or kp32virus* or kp34virus* or kp36virus* or kpp10virus* or kpp25virus* or kunsagivirus* or l5virus* or labyrnavirus* or lagovirus* or lambdaarterivirus* or lambdapapillomavirus* or lambdatorquevirus* or lambdavirus* or laroyevirus* or lausannevirus* or ledantevirus* or leishmaniavirus* or lentivirus* or leporipoxvirus* or letovirus* or levivirus* or liefievirus* or likavirus* or limestonevirus* or limnipivirus* or lincruvirus* or lineavirus* or lit1virus* or lmd1virus* or loanvirus* or lolavirus* or luchacovirus* or luteovirus* or luz24virus* or luz7virus* or lymphocryptovirus* or lymphocystivirus* or lyssavirus* or m12virus* or macanavirus* or macavirus* or machinavirus* or machlomovirus* or macluravirus* or macronovirus* or maculavirus* or mamastrovirus* or mammarenavirus* or mandarivirus* or marafivirus* or marburgvirus* or mardivirus* or marnavirus* or marseillevirus* or marthavirus* or marvinvirus* or mastadenovirus* or mastrevirus* or mavirus* or megabirnavirus* or megalocytivirus* or megrivirus* or menolivirus* or merbecovirus* or metapneumovirus* or metavirus* or milecovirus* or mimivirus* or mimoreovirus* or minacovirus* or minunacovirus* or mischivirus* or mitartevirus* or mitovirus* or mivirus* or mobatvirus* or mobuvirus* or molluscipoxvirus* or mooglevirus* or moonvirus* or moordecovirus* or morbillivirus* or mosavirus* or msw3virus* or muarterivirus* or mudcatvirus* or 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p100virus* or p12002virus* or p12024virus* or p1virus* or p22virus* or p23virus* or p2virus* or p68virus* or p70virus* or pa6virus* or pagevirus* or paguronivirus* or pakpunavirus* or pamx74virus* or panicovirus* or papanivirus* or parapoxvirus* or parechovirus* or partitivirus* or pasivirus* or passerivirus* or patiencevirus* or pbi1virus* or pbunavirus* or pecluvirus* or pedacovirus* or pedartevirus* or pegivirus* or pelarspovirus* or penstyldensovirus* or pepy6virus* or percavirus* or perhabdovirus* or peropuvirus* or pestivirus* or petuvirus* or pfr1virus* or pg1virus* or phaeovirus* or phasivirus* or phayoncevirus* or phi29virus* or phic31virus* or phicbkvirus* or phieco32virus* or phietavirus* or phifelvirus* or phijl1virus* or phikmvvirus* or phikzvirus* or phipapillomavirus* or phix174microvirus* or phlebovirus* or phytoreovirus* or picobirnavirus* or pidchovirus* or pipapillomavirus* or pipefishvirus* or pis4avirus* or piscihepevirus* or planidovirus* or plasmavirus* or platypuvirus* or plectrovirus* or plotvirus* or poacevirus* or pocjvirus* or polemovirus* or polerovirus* or polyomavirus* or pomovirus* or porprismacovirus* or

potamipivirus* or potexvirus* or potyvirus* or pradovirus* or prasinovirus* or pregotovirus* or proboscivirus* or prosimiispumavirus* or protobacilladnavirus* or protoparvovirus* or prtbvirus* or prunevirus* or prymnesiovirus* or psavirus* or pseudovirus* or psimunavirus* or psipapillomavirus* or quadrivirus* or quaranjavirus* or r4virus* or rabovirus* or ranavirus* or raphidovirus* or rb49virus* or rb69virus* or rdjlvirus* or redivirus* or renitovirus* or reovirus* or reptarenavirus* or rer2virus* or respirovirus* or retrovirus* or reyvirus* or rhadinovirus* or rheph4virus* or rhinacovirus* or rhinovirus* or rhizidiovirus* or rhopapillomavirus* or robigovirus* or rogue1virus* or rosadnavirus* or rosavirus* or rosebushvirus* or roseolovirus* or rotavirus* or roymovirus* or rsl2virus* or rslunavirus* or rtpvirus* or rubivirus* or rubulavirus* or rudivirus* or rymovirus* or s16virus* or sadwavirus* or saetivirus* or sakobuvirus* or salivirus* or salmonivirus* or salterprovirus* or sap6virus* or sapelovirus* or sapovirus* or sarbecovirus* or schizot4virus* or sclerodarnavirus* or sclerotimonavirus* or scutavirus* or se1virus* or seadornavirus* or sectovirus* or secunda5virus* or semotivirus* or send513virus* or senecavirus* or senegalvirus* or sep1virus* or septima3virus* or sequivirus* or setracovirus* or seuratvirus* or sextaecvirus* or sfi11virus* or sfi21dt1virus* or shanbavirus* or shangavirus* or shaspivirus* or sheartevirus* or siadenovirus* or sicinivirus* or sigmapapillomavirus* or sigmavirus* or silviavirus* or simiispumavirus* or simplexvirus* or sinaivirus* or sirevirus* or sitaravirus* or sk1virus* or slashvirus* or smoothievirus* or sobemovirus* or socyvirus* or solendovirus* or sopolycivirus* or soupsvirus* or soymovirus* or sp18virus* or sp31virus* or sp58virus* or sp6virus* or spbetavirus* or spiromicrovirus* or spn3virus* or spo1virus* or sprivivirus* or sputnikvirus* or sripuvirus* or ssp2virus* or striwavirus* or suipoxvirus* or sunshinevirus* or suspvirus* or svunavirus* or t1virus* or t4virus* or t5virus* or t7virus* or tankvirus* or tapwovirus* or taupapillomavirus* or tegacovirus* or tenuivirus* or tepovirus* or teschovirus* or tetraparvovirus* or tg1virus* or thetaarterivirus* or thetapapillomavirus* or thetatorquevirus* or thogotovirus* or thottimvirus* or tibrovirus* or tilapinevirus* or tin2virus* or tipravirus* or tiruvirus* or titanvirus* or tl2011virus* or tlsvirus* or tm4virus* or tobamovirus* or tobravirus* or tombusvirus* or topocuvirus* or torchivirus* or torovirus* or torradovirus* or tospovirus* or totivirus* or toursvirus* or tp21virus* or tp84virus* or treisdeltapapillomavirus* or treisepsilonpapillomavirus* or treisetapapillomavirus* or treisiotapapillomavirus* or treiskappapapillomavirus* or treisthetapapillomavirus* or treiszetapapillomavirus* or tremovirus* or triatovirus* or triavirus* or trichomonasvirus* or trichovirus* or trigintaduovirus* or tritimovirus* or tsarbombavirus* or tungrovirus* or tunisvirus* or tupavirus* or turncurtovirus* or turrinivirus* or twortvirus* or tymovirus* or umbravirus* or una4virus* or una961virus* or upsilonpapillomavirus* or v5virus* or varicellovirus* or varicosavirus* or vegasvirus* or velarivirus* or vendettavirus* or vesiculovirus* or vesivirus* or vespertiliovirus* or vhmlvirus* or vi1virus* or victorivirus* or virtovirus* or virus* or vitivirus* or vp5virus* or waikavirus* or wbetavirus* or wenilivirus* or whispovirus* or wildcatvirus* or wizardvirus* or woesvirus* or wphvirus* or wubeivirus* or wuhivirus* or wumivirus* or xipapillomavirus* or xp10virus* or yatapoxvirus* or ydn12virus* or yingvirus* or yuavirus* or yuyuevirus* or zeavirus* or zetaarterivirus* or zetapapillomavirus* or zetatorquevirus*).mp.
11. ("2019 ncov" or "2019nCoV" or "covid 19" or "severe acute respiratory syndrome coronavirus 2" or "sars cov 2").mp.
12. or/7-11
13. 6 and 12
14. (schedul* or timetable* or waiting or appointment? or e-mail or telephone? or electronic mail).tw,kw.
15. (triage or triaging or self-triage or screening or telescreening or tele-screen* or remote or telephone*).tw,kw.
16. (pre-arrival or remote* or check-in or checked in).tw,kw.
17. (visitor? or bathroom? or tele-health or telehealth or videoconf* or video-conf*).tw,kw.
18. exp "Appointments and Schedules"/ or exp Triage/ or exp Telephone/ or exp Electronic Mail/ or exp Videoconferencing/ or exp Telemedicine/
19. or/14-18
20. 13 and 19
21. meta-analysis.pt.
22. meta-analysis/ or systematic review/ or meta-analysis as topic/ or "meta analysis (topic)"/ or "systematic review (topic)"/ or exp technology assessment, biomedical/
23. ((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab,kw.
24. ((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab,kw.
25. ((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab,kf,kw.
26. (data synthes* or data extraction* or data abstraction*).ti,ab,kf,kw.
27. (handsearch* or hand search*).ti,ab,kf,kw.
28. (mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab,kf,kw.
29. (met analy* or metanaly* or technology assessment* or HTA or HTAs or technology overview* or technology appraisal*).ti,ab,kf,kw.
30. (meta regression* or metaregression*).ti,ab,kf,kw.
31. (meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.
32. (medline or cochrane or pubmed or medlars or embase or cinahl).ti,ab,hw.
33. (cochrane or (health adj2 technology assessment) or evidence report).jw.
34. (comparative adj3 (efficacy or effectiveness)).ti,ab,kf,kw.
35. (outcomes research or relative effectiveness).ti,ab,kf,kw.
36. ((indirect or indirect treatment or mixed-treatment) adj comparison*).ti,ab,kf,kw.
37. or/21-36
38. (Randomized Controlled Trial or Controlled Clinical Trial or Pragmatic Clinical Trial or Equivalence Trial or Clinical Trial, Phase III).pt.
39. Randomized Controlled Trial/
40. exp Randomized Controlled Trials as Topic/
41. "Randomized Controlled Trial (topic)"/
42. Controlled Clinical Trial/ or exp Controlled Clinical Trials as Topic/ or "Controlled Clinical Trial (topic)"/ or Randomization/ or Random Allocation/ or Double-Blind Method/ or Double Blind Procedure/ or Double-Blind Studies/ or Single-Blind Method/ or Single Blind Procedure/ or Single-Blind Studies/ or Placebos/ or Placebo/ or Control Groups/ or Control Group/
43. (random* or sham or placebo*).ti,ab,hw,kf,kw.
44. ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw. 45. ((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw. 46. (control* adj3 (study or studies or trial* or group*)).ti,ab,kf,kw. 47. (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kw.
48. allocated.ti,ab,hw.
49. ((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kw.
50. ((equivalence or superiority or non-inferiority or noninferiority) adj3 (study or studies or trial*)).ti,ab,hw,kw.
51. (pragmatic study or pragmatic studies).ti,ab,hw,kw.
52. ((pragmatic or practical) adj3 trial*).ti,ab,hw,kw.

53. ((quasiexperimental or quasi-experimental) adj3 (study or studies or trial*)).ti,ab,hw,kw.
54. (phase adj3 (III or "3") adj3 (study or studies or trial*)).ti,hw,kw. 55. or/38-54
56. Epidemiologic Studies/ or exp Case Control Studies/ or exp Cohort Studies/
57. (case control or (cohort adj (study or studies)) or cohort analy$ or (follow up adj (study or studies)) or longitudinal or retrospective or cross sectional).tw.
58. Cross-Sectional Studies/
59. or/56-58
60. 37 or 55 or 59
61. 6 and 12 and 19 and 60
62. 20 not 61
63. limit 62 to last 25 years

Key area D and E

1. exp Personal Protective Equipment/
2. (PPE or ((personal or respiratory) adj1 protective equipment)).tw,kf.
3. ((face or mouth or surgical or membrane) adj3 (mask? or guard? or piece? or protector? or protection or mouthpiece? or shield? or respirator?)).tw,kf.
4. (gas mask? or gasmask? or mouthpiece? or facemask?).tw,kf.
5. ((air-purifying or industrial or protective) adj3 respirator?).tw,kf.
6. ((safety adj1 (glasses or lenses)) or goggles).tw,kf.
7. ((eye or mouth or head or clothing or gear) adj3 protect*).tw,kf.
8. (scrubs or gown? or glove?).tw,kf.
9. (N95 or visor?).tw,kf.
10. space suit?.tw,kf.
11. infection control.tw,kf.
12. pc.fs.
13. or/1-12
14. exp Stomatognathic Diseases/
15. exp Dentistry/
16. exp Oral Health/
17. exp Dental Facilities/
18. (dentist* or endodont* or orthodonti* or periodont* or prosthodont* or apicoectom* or gingivectom* or gingivoplast* or glossectom* or "mandibular advancement" or alveolectom* or alveoloplast* or vestibuloplast* or "root canal" or oral or oropharyng* or temporomandibular or TMJ or jaw or jaws or mandibular or maxillofacial or mandible* or maxilla* or "alveolar ridge" or dental or orthognathic or tooth or teeth or occlusion or malocclusion or mal-occlusion or odontolog* or tongue* or glossal or buccal or palatal or palate or palates or labial or lip or lips or gingiva* or gingiviti*).tw,kf.
19. or/14-18
20. 13 and 19
21. exp Viruses/
22. exp Virus Diseases/
23. (viridae or COVID-19 or AIDS or HIV or ebola or zika or "west nile" or shingles or SARS or MERS or chickenpox or smallpox or Chikungunya or epstein-barr or erythema or exanthum or influenza? or flu or HFMD or "heartland virus" or HFRS or hepatitis or herpes or cmeasles or mumps or "nipah virus" or Poliomyelitis or yersiniosis or rubella or salmonellosis or rabies).tw,kf.
24. (aalivirus* or ab18virus* or abouovirus* or abyssovirus* or acadianvirus* or ag3virus* or agatevirus* or agrican357virus* or aichivirus* or albetovirus* or alefpapillomavirus* or alfamovirus* or allexivirus* or allolevivirus* or almendravirus* or alpha3microvirus* or alphaabyssovirus* or alphaarterivirus* or alphabaculovirus* or alphacarmotetravirus* or alphacarmovirus* or alphacoronavirus* or alphaendornavirus* or alphaentomopoxvirus* or alphafusellovirus* or alphaguttavirus* or alphaherpesvirus* or alphainfluenzavirus* or alphaletovirus* or alphamesonivirus* or alphamononivirus* or alphanecrovirus* or alphanodavirus* or alphanudivirus* or alphapapillomavirus* or alphapartitivirus* or alphapermutotetravirus* or alphapleolipovirus* or alphapolyomavirus* or alphaportoglobovirus* or alpharetrovirus* or alphasphaerolipovirus* or alphaspiravirus* or alphatectivirus* or alphatorquevirus* or alphatristromavirus* or alphaturrivirus* or alphavirus* or amalgavirus* or ambidensovirus* or amdoparvovirus* or amigovirus* or ampelovirus* or ampivirus* or ampobartevirus* or ampullavirus* or anatolevirus* or andecovirus* or andromedavirus* or anphevirus* or anulavirus* or ap22virus* or aparavirus* or aphthovirus* or aplyccavirus* or aquabirnavirus* or aquamavirus* or aquaparamyxovirus* or aquareovirus* or arlivirus* or arv1virus* or ascovirus* or asfivirus* or atadenovirus* or attisvirus* or aumaivirus* or aureusvirus* or aurivirus* or avastrovirus* or avenavirus* or aveparvovirus* or aviadenovirus* or avibirnavirus* or avihepadnavirus* or avihepatovirus* or avipoxvirus* or avisivirus* or avulavirus* or b4virus* or babuvirus* or bacillarnavirus* or badnavirus* or bafinivirus* or balbicanovirus* or banyangvirus* or barnavirus* or barnyardvirus* or bastillevirus* or batrachovirus* or baxtervirus* or bc431virus* or bcep22virus* or bcep78virus* or bcepmuvirus* or bdellomicrovirus* or becurtovirus* or begomovirus* or behecravirus* or beidivirus* or benyvirus* or berhavirus* or bernal13virus* or betaarterivirus* or betabaculovirus* or betacarmovirus* or betacoronavirus* or betaendornavirus* or betaentomopoxvirus* or betafusellovirus* or betaguttavirus* or betaherpesvirus* or betainfluenzavirus* or betalipothrixvirus* or betanecrovirus* or betanodavirus* or betanudivirus* or betapapillomavirus* or betapartitivirus* or betapleolipovirus* or betapolyomavirus* or betaretrovirus* or betasphaerolipovirus* or betatectivirus* or betatetravirus* or betatorquevirus* or beturrivirus* or bevemovirus* or bicaudavirus* or bidensovirus* or bignuzvirus* or biquartavirus* or biseptimavirus* or blosnavirus* or blunervirus* or bocaparvovirus* or bolenivirus* or bongovirus* or bopivirus* or bostovirus* or botrexvirus* or botybirnavirus* or bovismacovirus* or bovispumavirus* or bpp1virus* or bracovirus* or brambyvirus* or brevidensovirus* or bromovirus* or bronvirus* or brujitavirus* or buldecovirus* or buttersvirus* or bxz1virus* or bymovirus* or c2virus* or c5virus* or cadicivirus* or cafeteriavirus* or calicivirus* or camvirus* or capillovirus* or capripoxvirus* or capulavirus* or carbovirus* or cardiovirus* or cardoreovirus* or carlavirus* or casualivirus* or caulimovirus* or cavemovirus* or cba120virus* or cba181virus* or cba41virus* or cbastvirus* or cc31virus* or cd119virus* or cecivirus* or cegacovirus* or centapoxvirus* or cervidpoxvirus* or charlievirus* or charybnivirus* or che8virus* or che9cvirus* or cheravirus* or chibartevirus* or chipapillomavirus* or chipolycivirus* or chivirus* or chlamydiamicrovirus* or chloriridovirus* or chlorovirus* or chordovirus* or chrysovirus* or cilevirus* or circovirus* or citrivirus* or cjw1virus* or clavavirus* or closterovirus* or coccolithovirus* or colacovirus* or coltivirus* or comovirus* or coopervirus* or copiparvovirus* or corndogvirus* or coronavirus* or corticovirus* or cosavirus* or cosmacovirus* or cp1virus* or cp220virus* or cp51virus* or cp8virus* or cr3virus* or cradenivirus* or crinivirus* or cripavirus* or

crocodylidpoxvirus* or crohivirus* or cronusvirus* or crustavirus* or cryspovirus* or cucumovirus* or cuevavirus* or curiovirus* or curtovirus* or cvm10virus* or cyclovirus* or cypovirus* or cyprinivirus* or cystovirus* or cytomegalovirus* or cytorhabdovirus* or d3112virus* or d3virus* or debiartevirus* or decacovirus* or decronivirus* or decurrovirus* or deltaarterivirus* or deltabaculovirus* or deltacoronavirus* or deltaflexivirus* or deltainfluenzavirus* or deltalipothrixvirus* or deltapapillomavirus* or deltapartitivirus* or deltapolyomavirus* or deltaretrovirus* or deltatorquevirus* or deltavirus* or demosthenesvirus* or densovirus* or dependoparvovirus* or dfl12virus* or dianthovirus* or diatodnavirus* or dichorhavirus* or dicipivirus* or dinodnavirus* or dinornavirus* or dinovernavirus* or divavirus* or doucettevirus* or dragsmacovirus* or drosmacovirus* or drosmacovirus*2 or dumedivirus* or duvinacovirus* or dyochipapillomavirus* or dyodeltapapillomavirus* or dyoepsilonpapillomavirus* or dyoetapapillomavirus* or dyoiotapapillomavirus* or dyokappapapillomavirus* or dyolambdapapillomavirus* or dyomupapillomavirus* or dyonupapillomavirus* or dyoomegapapillomavirus* or dyoomikronpapillomavirus* or dyophipapillomavirus* or dyopipapillomavirus* or dyopsipapillomavirus* or dyorhopapillomavirus* or dyosigmapapillomavirus* or dyotaupapillomavirus* or dyothetapapillomavirus* or dyoupsilonpapillomavirus* or dyoxipapillomavirus* or dyozetapapillomavirus* or e125virus* or ea214virus* or ea92virus* or eah2virus* or ebolavirus* or eiauvirus* or elvirus* or emaravirus* or embecovirus* or enamovirus* or enselivirus* or enterovirus* or entomobirnavirus* or entomopoxvirus* or ephemerovirus* or epsilon15virus* or epsilonarterivirus* or epsilonpapillomavirus* or epsilonretrovirus* or epsilontorquevirus* or equispumavirus* or eragrovirus* or erbovirus* or errantivirus* or erythroparvovirus* or etaarterivirus* or etapapillomavirus* or etatorquevirus* or eurpobartevirus* or f116virus* or fabavirus* or felispumavirus* or felixo1virus* or feravirus* or ferlavirus* or ff47virus* or fibrovirus* or fijivirus* or fishburnevirus* or flavivirus* or foveavirus* or fri1virus* or furovirus* or g4microvirus* or g7cvirus* or gaiavirus* or gallantivirus* or gallivirus* or gammaarterivirus* or gammabaculovirus* or gammacarmovirus* or gammacoronavirus* or gammaentomopoxvirus* or gammaherpesvirus* or gammainfluenzavirus* or gammalipothrixvirus* or gammapapillomavirus* or gammapartitivirus* or gammapleolipovirus* or gammapolyomavirus* or gammaretrovirus* or gammasphaerolipovirus* or gammatorquevirus* or gemycircularvirus* or gemyduguivirus* or gemygorvirus* or gemykibivirus* or gemykolovirus* or gemykrogvirus* or gemykroznavirus* or gemytondvirus* or gemyvongvirus* or giardiavirus* or gilesvirus* or globulovirus* or glossinavirus* or goravirus* or gordonvirus* or gordtnkvirus* or goukovirus* or grablovirus* or granulovirus* or gyrovirus* or habenivirus* or hanalivirus* or hapavirus* or hapunavirus* or harkavirus* or harrisonvirus* or hartmanivirus* or hawkeyevirus* or hedartevirus* or hemivirus* or henipavirus* or hepacivirus* or hepandensovirus* or hepatovirus* or herbevirus* or herdecovirus* or herpesvirus* or hibecovirus* or higrevirus* or hk578virus* or hk97virus* or hordeivirus* or horwuvirus* or hp1virus* or hubavirus* or huchismacovirus* or hudivirus* or hudovirus* or hunnivirus* or hupolycivirus* or hypovirus* or hytrovirus* or ichnovirus* or ichtadenovirus* or ictalurivirus* or idaeovirus* or idnoreovirus* or iflavirus* or igacovirus* or ilarvirus* or iltovirus* or infratovirus* or inovirus* or inshuvirus* or invictavirus* or iotaarterivirus* or iotapapillomavirus* or iotatorquevirus* or ipomovirus* or iridovirus* or isavirus* or iteradensovirus* or jd18virus* or jenstvirus* or jerseyvirus* or jimmervirus* or jonvirus* or js98virus* or jwalphavirus* or jwxvirus* or k1gvirus* or kadilivirus* or kaftartevirus* or 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titanvirus* or tl2011virus* or tlsvirus* or tm4virus* or tobamovirus* or tobravirus* or tombusvirus* or topocuvirus* or torchivirus* or torovirus* or torradovirus* or tospovirus* or totivirus* or toursvirus* or tp21virus* or tp84virus* or treisdeltapapillomavirus* or treisepsilonpapillomavirus* or treisetapapillomavirus* or treisiotapapillomavirus* or treiskappapapillomavirus* or treisthetapapillomavirus* or treiszetapapillomavirus* or tremovirus* or triatovirus* or triavirus* or trichomonasvirus* or trichovirus* or trigintaduovirus* or tritimovirus* or tsarbombavirus* or tungrovirus* or tunisvirus* or tupavirus* or turncurtovirus* or turrinivirus* or twortvirus* or tymovirus* or umbravirus* or una4virus* or una961virus* or upsilonpapillomavirus* or v5virus* or varicellovirus* or varicosavirus* or vegasvirus* or velarivirus* or vendettavirus* or vesiculovirus* or vesivirus* or vespertiliovirus* or vhmlvirus* or vi1virus* or victorivirus* or virtovirus* or virus* or vitivirus* or vp5virus* or waikavirus* or wbetavirus* or wenilivirus* or whispovirus* or wildcatvirus* or wizardvirus* or woesvirus* or wphvirus* or wubeivirus* or wuhivirus* or wumivirus* or xipapillomavirus* or xp10virus* or yatapoxvirus* or ydn12virus* or yingvirus* or yuavirus* or yuyuevirus* or zeavirus* or zetaarterivirus* or zetapapillomavirus* or zetatorquevirus*).mp.
25. ("2019 ncov" or "2019nCoV" or "covid 19" or "severe acute respiratory syndrome coronavirus 2" or "sars cov 2").mp.
26. or/21-25
27. 20 and 26
28. or/1-10
29. 19 and 26 and 28
30. limit 29 to last 25 years

Key area F

1. exp Stomatognathic Diseases/
2. exp Dentistry/
3. exp Oral Health/
4. exp Dental Facilities/
5. (dentist* or endodont* or orthodonti* or periodont* or prosthodont* or apicoectom* or gingivectom* or gingivoplast* or glossectom* or "mandibular advancement" or alveolectom* or alveoloplast* or vestibuloplast* or "root canal" or oral or oropharyng* or temporomandibular or TMJ or jaw or jaws or mandibular or maxillofacial or mandible* or maxilla* or "alveolar ridge" or dental or orthognathic or tooth or teeth or occlusion or malocclusion or mal-occlusion or odontolog* or tongue* or glossal or buccal or palatal or palate or palates or labial or lip or lips or gingiva* or gingiviti*).tw,kw.
6. or/1-5
7. exp Viruses/
8. exp Virus Diseases/
9. (viridae or COVID-19 or AIDS or HIV or ebola or zika or "west nile" or shingles or SARS or MERS or chickenpox or smallpox or Chikungunya or epstein-barr or erythema or exanthum or influenza? or flu or HFMD or "heartland virus" or HFRS or hepatitis or herpes or cmeasles or mumps or "nipah virus" or Poliomyelitis or yersiniosis or rubella or salmonellosis or rabies).tw,kw.
10. (aalivirus* or ab18virus* or abouovirus* or abyssovirus* or acadianvirus* or ag3virus* or agatevirus* or agrican357virus* or aichivirus* or albetovirus* or alefpapillomavirus* or alfamovirus* or allexivirus* or allolevivirus* or almendravirus* or alpha3microvirus* or alphaabyssovirus* or alphaarterivirus* or alphabaculovirus* or alphacarmotetravirus* or alphacarmovirus* or alphacoronavirus* or alphaendornavirus* or alphaentomopoxvirus* or alphafusellovirus* or alphaguttavirus* or alphaherpesvirus* or alphainfluenzavirus* or alphaletovirus* or alphamesonivirus* or alphamononivirus* or alphanecrovirus* or alphanodavirus* or alphanudivirus* or alphapapillomavirus* or alphapartitivirus* or alphapermutotetravirus* or alphapleolipovirus* or alphapolyomavirus* or alphaportoglobovirus* or alpharetrovirus* or alphasphaerolipovirus* or alphaspiravirus* or alphatectivirus* or alphatorquevirus* or alphatristromavirus* or alphaturrivirus* or alphavirus* or amalgavirus* or ambidensovirus* or amdoparvovirus* or amigovirus* or ampelovirus* or ampivirus* or ampobartevirus* or ampullavirus* or anatolevirus* or andecovirus* or andromedavirus* or anphevirus* or anulavirus* or ap22virus* or aparavirus* or aphthovirus* or aplyccavirus* or aquabirnavirus* or aquamavirus* or aquaparamyxovirus* or aquareovirus* or arlivirus* or arv1virus* or ascovirus* or asfivirus* or atadenovirus* or attisvirus* or aumaivirus* or aureusvirus* or aurivirus* or avastrovirus* or avenavirus* or aveparvovirus* or aviadenovirus* or avibirnavirus* or avihepadnavirus* or avihepatovirus* or avipoxvirus* or avisivirus* or avulavirus* or b4virus* or babuvirus* or bacillarnavirus* or badnavirus* or bafinivirus* or balbicanovirus* or banyangvirus* or barnavirus* or barnyardvirus* or bastillevirus* or batrachovirus* or baxtervirus* or bc431virus* or bcep22virus* or bcep78virus* or bcepmuvirus* or bdellomicrovirus* or becurtovirus* or begomovirus* or behecravirus* or beidivirus* or benyvirus* or berhavirus* or bernal13virus* or betaarterivirus* or betabaculovirus* or betacarmovirus* or betacoronavirus* or betaendornavirus* or betaentomopoxvirus* or betafusellovirus* or betaguttavirus* or betaherpesvirus* or betainfluenzavirus* or betalipothrixvirus* or betanecrovirus* or betanodavirus* or betanudivirus* or betapapillomavirus* or betapartitivirus* or betapleolipovirus* or betapolyomavirus* or betaretrovirus* or betasphaerolipovirus* or betatectivirus* or betatetravirus* or betatorquevirus* or beturrivirus* or bevemovirus* or bicaudavirus* or bidensovirus* or bignuzvirus* or biquartavirus* or biseptimavirus* or blosnavirus* or blunervirus* or bocaparvovirus* or bolenivirus* or bongovirus* or bopivirus* or bostovirus* or botrexvirus* or botybirnavirus* or bovismacovirus* or bovispumavirus* or bpp1virus* or bracovirus* or brambyvirus* or brevidensovirus* or bromovirus* or bronvirus* or brujitavirus* or buldecovirus* or buttersvirus* or bxz1virus* or bymovirus* or c2virus* or c5virus* or cadicivirus* or cafeteriavirus* or calicivirus* or camvirus* or capillovirus* or capripoxvirus* or capulavirus* or carbovirus* or cardiovirus* or cardoreovirus* or carlavirus* or casualivirus* or caulimovirus* or cavemovirus* or cba120virus* or cba181virus* or cba41virus* or cbastvirus* or cc31virus* or cd119virus* or cecivirus* or cegacovirus* or centapoxvirus* or cervidpoxvirus* or charlievirus* or charybnivirus* or che8virus* or che9cvirus* or cheravirus* or chibartevirus* or chipapillomavirus* or chipolycivirus* or chivirus* or chlamydiamicrovirus* or chloriridovirus* or chlorovirus* or chordovirus* or chrysovirus* or cilevirus* or circovirus* or citrivirus* or cjw1virus* or clavavirus* or closterovirus* or coccolithovirus* or colacovirus* or coltivirus* or comovirus* or coopervirus* or copiparvovirus* or corndogvirus* or coronavirus* or corticovirus* or cosavirus* or cosmacovirus* or cp1virus* or cp220virus* or cp51virus* or cp8virus* or cr3virus* or cradenivirus* or crinivirus* or cripavirus* or crocodylidpoxvirus* or crohivirus* or cronusvirus* or crustavirus* or cryspovirus* or cucumovirus* or cuevavirus* or curiovirus* or curtovirus* or cvm10virus* or cyclovirus* or cypovirus* or cyprinivirus* or cystovirus* or cytomegalovirus* or cytorhabdovirus* or d3112virus* or d3virus* or debiartevirus* or decacovirus* or decronivirus* or decurrovirus* or deltaarterivirus* or deltabaculovirus* or deltacoronavirus* or deltaflexivirus* or deltainfluenzavirus* or deltalipothrixvirus* or deltapapillomavirus* or deltapartitivirus* or deltapolyomavirus* or deltaretrovirus* or deltatorquevirus* or deltavirus* or demosthenesvirus* or densovirus* or dependoparvovirus* or dfl12virus* or dianthovirus* or diatodnavirus* or dichorhavirus* or dicipivirus* or dinodnavirus* or dinornavirus* or dinovernavirus* or divavirus* or doucettevirus* or dragsmacovirus* or drosmacovirus* or drosmacovirus*2 or dumedivirus* or duvinacovirus* or dyochipapillomavirus* or dyodeltapapillomavirus* or dyoepsilonpapillomavirus* or dyoetapapillomavirus* or dyoiotapapillomavirus* or dyokappapapillomavirus* or dyolambdapapillomavirus* or dyomupapillomavirus* or dyonupapillomavirus* or dyoomegapapillomavirus* or dyoomikronpapillomavirus* or dyophipapillomavirus* or dyopipapillomavirus* or dyopsipapillomavirus* or dyorhopapillomavirus* or dyosigmapapillomavirus* or dyotaupapillomavirus* or dyothetapapillomavirus* or

dyoupsilonpapillomavirus* or dyoxipapillomavirus* or dyozetapapillomavirus* or e125virus* or ea214virus* or ea92virus* or eah2virus* or ebolavirus* or eiauvirus* or elvirus* or emaravirus* or embecovirus* or enamovirus* or enselivirus* or enterovirus* or entomobirnavirus* or entomopoxvirus* or ephemerovirus* or epsilon15virus* or epsilonarterivirus* or epsilonpapillomavirus* or epsilonretrovirus* or epsilontorquevirus* or equispumavirus* or eragrovirus* or erbovirus* or errantivirus* or erythroparvovirus* or etaarterivirus* or etapapillomavirus* or etatorquevirus* or eurpobartevirus* or f116virus* or fabavirus* or felispumavirus* or felixo1virus* or feravirus* or ferlavirus* or ff47virus* or fibrovirus* or fijivirus* or fishburnevirus* or flavivirus* or foveavirus* or fri1virus* or furovirus* or g4microvirus* or g7cvirus* or gaiavirus* or gallantivirus* or gallivirus* or gammaarterivirus* or gammabaculovirus* or gammacarmovirus* or gammacoronavirus* or gammaentomopoxvirus* or gammaherpesvirus* or gammainfluenzavirus* or gammalipothrixvirus* or gammapapillomavirus* or gammapartitivirus* or gammapleolipovirus* or gammapolyomavirus* or gammaretrovirus* or gammasphaerolipovirus* or gammatorquevirus* or gemycircularvirus* or gemyduguivirus* or gemygorvirus* or gemykibivirus* or gemykolovirus* or gemykrogvirus* or gemykroznavirus* or gemytondvirus* or gemyvongvirus* or giardiavirus* or gilesvirus* or globulovirus* or glossinavirus* or goravirus* or gordonvirus* or gordtnkvirus* or goukovirus* or grablovirus* or granulovirus* or gyrovirus* or habenivirus* or hanalivirus* or hapavirus* or hapunavirus* or harkavirus* or harrisonvirus* or hartmanivirus* or hawkeyevirus* or hedartevirus* or hemivirus* or henipavirus* or hepacivirus* or hepandensovirus* or hepatovirus* or herbevirus* or herdecovirus* or herpesvirus* or hibecovirus* or higrevirus* or hk578virus* or hk97virus* or hordeivirus* or horwuvirus* or hp1virus* or hubavirus* or huchismacovirus* or hudivirus* or hudovirus* or hunnivirus* or hupolycivirus* or hypovirus* or hytrovirus* or ichnovirus* or ichtadenovirus* or ictalurivirus* or idaeovirus* or idnoreovirus* or iflavirus* or igacovirus* or ilarvirus* or iltovirus* or infratovirus* or inovirus* or inshuvirus* or invictavirus* or iotaarterivirus* or iotapapillomavirus* or iotatorquevirus* or ipomovirus* or iridovirus* or isavirus* or iteradensovirus* or jd18virus* or jenstvirus* or jerseyvirus* or jimmervirus* or jonvirus* or js98virus* or jwalphavirus* or jwxvirus* or k1gvirus* or kadilivirus* or kaftartevirus* or kappaarterivirus* or kappapapillomavirus* or kappatorquevirus* or karsalivirus* or kayvirus* or kelleziovirus* or kf1virus* or kieseladnavirus* or kigiartevirus* or kobuvirus* or korravirus* or kp15virus* or kp32virus* or kp34virus* or kp36virus* or kpp10virus* or kpp25virus* or kunsagivirus* or l5virus* or labyrnavirus* or lagovirus* or lambdaarterivirus* or lambdapapillomavirus* or lambdatorquevirus* or lambdavirus* or laroyevirus* or lausannevirus* or ledantevirus* or leishmaniavirus* or lentivirus* or leporipoxvirus* or letovirus* or levivirus* or liefievirus* or likavirus* or limestonevirus* or limnipivirus* or lincruvirus* or lineavirus* or lit1virus* or lmd1virus* or loanvirus* or lolavirus* or luchacovirus* or luteovirus* or luz24virus* or luz7virus* or lymphocryptovirus* or lymphocystivirus* or lyssavirus* or m12virus* or macanavirus* or macavirus* or machinavirus* or machlomovirus* or macluravirus* or macronovirus* or maculavirus* or mamastrovirus* or mammarenavirus* or mandarivirus* or marafivirus* or marburgvirus* or mardivirus* or marnavirus* or marseillevirus* or marthavirus* or marvinvirus* or mastadenovirus* or mastrevirus* or mavirus* or megabirnavirus* or megalocytivirus* or megrivirus* or menolivirus* or merbecovirus* or metapneumovirus* or metavirus* or milecovirus* or mimivirus* or mimoreovirus* or minacovirus* or minunacovirus* or mischivirus* or mitartevirus* or mitovirus* or mivirus* or mobatvirus* or mobuvirus* or molluscipoxvirus* or mooglevirus* or moonvirus* or moordecovirus* or morbillivirus* or mosavirus* or msw3virus* or muarterivirus* or mudcatvirus* or mupapillomavirus* or muromegalovirus* or muscavirus* or muvirus* or mycoflexivirus* or mycoreovirus* or myohalovirus* or myotacovirus* or n15virus* or n4virus* or namcalivirus* or nanovirus* or narnavirus* or nebovirus* or nepovirus* or nidovirus* or nit1virus* or nobecovirus* or nona33virus* or nonagvirus* or nonanavirus* or norovirus* or novirhabdovirus* or np1virus* or nucleopolyhedrovirus* or nucleorhabdovirus* or nudivirus* or nupapillomavirus* or nyavirus* or nyctacovirus* or nyfulvavirus* or nymphadoravirus* or ofalivirus* or okavirus* or oleavirus* or omegapapillomavirus* or omegatetravirus* or omegavirus* or omikronpapillomavirus* or oncotshavirus* or oncovirus* or ophiovirus* or orbivirus* or orinovirus* or orivirus* or orthobornavirus* or orthobunyavirus* or orthohantavirus* or orthohepadnavirus* or orthohepevirus* or orthonairovirus* or orthophasmavirus* or orthopneumovirus* or orthopoxvirus* or orthoreovirus* or oryzavirus* or oscivirus* or ostreavirus* or ourmiavirus* or p100virus* or p12002virus* or p12024virus* or p1virus* or p22virus* or p23virus* or p2virus* or p68virus* or p70virus* or pa6virus* or pagevirus* or paguronivirus* or pakpunavirus* or pamx74virus* or panicovirus* or papanivirus* or parapoxvirus* or parechovirus* or partitivirus* or pasivirus* or passerivirus* or patiencevirus* or pbi1virus* or pbunavirus* or pecluvirus* or pedacovirus* or pedartevirus* or pegivirus* or pelarspovirus* or penstyldensovirus* or pepy6virus* or percavirus* or perhabdovirus* or peropuvirus* or pestivirus* or petuvirus* or pfr1virus* or pg1virus* or phaeovirus* or phasivirus* or phayoncevirus* or phi29virus* or phic31virus* or phicbkvirus* or phieco32virus* or phietavirus* or phifelvirus* or phijl1virus* or phikmvvirus* or phikzvirus* or phipapillomavirus* or 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or slashvirus* or smoothievirus* or sobemovirus* or socyvirus* or solendovirus* or sopolycivirus* or soupsvirus* or soymovirus* or sp18virus* or sp31virus* or sp58virus* or sp6virus* or spbetavirus* or spiromicrovirus* or spn3virus* or spo1virus* or sprivivirus* or sputnikvirus* or sripuvirus* or ssp2virus* or striwavirus* or suipoxvirus* or sunshinevirus* or suspvirus* or svunavirus* or t1virus* or t4virus* or t5virus* or t7virus* or tankvirus* or tapwovirus* or taupapillomavirus* or tegacovirus* or tenuivirus* or tepovirus* or teschovirus* or tetraparvovirus* or tg1virus* or thetaarterivirus* or thetapapillomavirus* or thetatorquevirus* or thogotovirus* or thottimvirus* or tibrovirus* or tilapinevirus* or tin2virus* or tipravirus* or tiruvirus* or titanvirus* or tl2011virus* or tlsvirus* or tm4virus* or tobamovirus* or tobravirus* or tombusvirus* or topocuvirus* or torchivirus* or torovirus* or torradovirus* or tospovirus* or totivirus* or toursvirus* or tp21virus* or tp84virus* or 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yingvirus* or yuavirus* or yuyuevirus* or zeavirus* or zetaarterivirus* or zetapapillomavirus* or zetatorquevirus*).mp.

11. ("2019 ncov" or "2019nCoV" or "covid 19" or "severe acute respiratory syndrome coronavirus 2" or "sars cov 2").mp.

12. or/7-11
13. exp Aerosols/
14. (aerosol or aerosols or aerosoli?ation).tw,kw. or bio-aerosol.mp. or bio-aerosols.tw,kw.
15. (droplet? or sneeze? or splatter or AGP).tw,kw.
16. (handpiece? or hand piece? or rotary or scaler? or respirator or respirators or suction? or drill*).tw,kw.
17. 14 or 15 or 16
18. 6 and 12 and 17

Key area G

1. exp Stomatognathic Diseases/
2. exp Dentistry/
3. exp Oral Health/
4. exp Dental Facilities/
5. (dentist* or endodont* or orthodonti* or periodont* or prosthodont* or apicoectom* or gingivectom* or gingivoplast* or glossectom* or "mandibular advancement" or alveolectom* or alveoloplast* or vestibuloplast* or "root canal" or oral or oropharyng* or temporomandibular or TMJ or jaw or jaws or mandibular or maxillofacial or mandible* or maxilla* or "alveolar ridge" or dental or orthognathic or tooth or teeth or occlusion or malocclusion or mal-occlusion or odontolog* or tongue* or glossal or buccal or palatal or palate or palates or labial or lip or lips or gingiva* or gingiviti*).tw,kw.
6. or/1-5
7. exp Viruses/
8. exp Virus Diseases/
9. (viridae or COVID-19 or AIDS or HIV or ebola or zika or "west nile" or shingles or SARS or MERS or chickenpox or smallpox or Chikungunya or epstein-barr or erythema or exanthum or influenza? or flu or HFMD or "heartland virus" or HFRS or hepatitis or herpes or cmeasles or mumps or "nipah virus" or Poliomyelitis or yersiniosis or rubella or salmonellosis or rabies).tw,kw.
10. (aalivirus* or ab18virus* or abouovirus* or abyssovirus* or acadianvirus* or ag3virus* or agatevirus* or agrican357virus* or aichivirus* or albetovirus* or alefpapillomavirus* or alfamovirus* or allexivirus* or allolevivirus* or almendravirus* or alpha3microvirus* or alphaabyssovirus* or alphaarterivirus* or alphabaculovirus* or alphacarmotetravirus* or alphacarmovirus* or alphacoronavirus* or alphaendornavirus* or alphaentomopoxvirus* or alphafusellovirus* or alphaguttavirus* or alphaherpesvirus* or alphainfluenzavirus* or alphaletovirus* or alphamesonivirus* or alphamononivirus* or alphanecrovirus* or alphanodavirus* or alphanudivirus* or alphapapillomavirus* or alphapartitivirus* or alphapermutotetravirus* or alphapleolipovirus* or alphapolyomavirus* or alphaportoglobovirus* or alpharetrovirus* or alphasphaerolipovirus* or alphaspiravirus* or alphatectivirus* or alphatorquevirus* or alphatristromavirus* or alphaturrivirus* or alphavirus* or amalgavirus* or ambidensovirus* or amdoparvovirus* or amigovirus* or ampelovirus* or ampivirus* or ampobartevirus* or ampullavirus* or anatolevirus* or andecovirus* or andromedavirus* or anphevirus* or anulavirus* or ap22virus* or aparavirus* or aphthovirus* or aplyccavirus* or aquabirnavirus* or aquamavirus* or aquaparamyxovirus* or aquareovirus* or arlivirus* or arv1virus* or ascovirus* or asfivirus* or atadenovirus* or attisvirus* or aumaivirus* or aureusvirus* or aurivirus* or avastrovirus* or avenavirus* or aveparvovirus* or aviadenovirus* or avibirnavirus* or avihepadnavirus* or avihepatovirus* or avipoxvirus* or avisivirus* or avulavirus* or b4virus* or babuvirus* or bacillarnavirus* or badnavirus* or bafinivirus* or balbicanovirus* or banyangvirus* or barnavirus* or barnyardvirus* or bastillevirus* or batrachovirus* or baxtervirus* or bc431virus* or bcep22virus* or bcep78virus* or bcepmuvirus* or bdellomicrovirus* or becurtovirus* or begomovirus* or behecravirus* or beidivirus* or benyvirus* or berhavirus* or bernal13virus* or betaarterivirus* or betabaculovirus* or betacarmovirus* or betacoronavirus* or betaendornavirus* or betaentomopoxvirus* or betafusellovirus* or betaguttavirus* or betaherpesvirus* or betainfluenzavirus* or betalipothrixvirus* or betanecrovirus* or betanodavirus* or betanudivirus* or betapapillomavirus* or betapartitivirus* or betapleolipovirus* or betapolyomavirus* or betaretrovirus* or betasphaerolipovirus* or betatectivirus* or betatetravirus* or betatorquevirus* or beturrivirus* or bevemovirus* or bicaudavirus* or bidensovirus* or bignuzvirus* or biquartavirus* or biseptimavirus* or blosnavirus* or blunervirus* or bocaparvovirus* or bolenivirus* or bongovirus* or bopivirus* or bostovirus* or botrexvirus* or botybirnavirus* or bovismacovirus* or bovispumavirus* or bpp1virus* or bracovirus* or brambyvirus* or brevidensovirus* or bromovirus* or bronvirus* or brujitavirus* or buldecovirus* or buttersvirus* or bxz1virus* or bymovirus* or c2virus* or c5virus* or cadicivirus* or cafeteriavirus* or calicivirus* or camvirus* or capillovirus* or capripoxvirus* or capulavirus* or carbovirus* or cardiovirus* or cardoreovirus* or carlavirus* or casualivirus* or caulimovirus* or cavemovirus* or cba120virus* or cba181virus* or cba41virus* or cbastvirus* or cc31virus* or cd119virus* or cecivirus* or cegacovirus* or centapoxvirus* or cervidpoxvirus* or charlievirus* or charybnivirus* or che8virus* or che9cvirus* or cheravirus* or chibartevirus* or chipapillomavirus* or chipolycivirus* or chivirus* or chlamydiamicrovirus* or chloriridovirus* or chlorovirus* or chordovirus* or chrysovirus* or cilevirus* or circovirus* or citrivirus* or cjw1virus* or clavavirus* or closterovirus* or coccolithovirus* or colacovirus* or coltivirus* or comovirus* or coopervirus* or copiparvovirus* or corndogvirus* or coronavirus* or corticovirus* or cosavirus* or cosmacovirus* or cp1virus* or cp220virus* or cp51virus* or cp8virus* or cr3virus* or cradenivirus* or crinivirus* or cripavirus* or crocodylidpoxvirus* or crohivirus* or cronusvirus* or crustavirus* or cryspovirus* or cucumovirus* or cuevavirus* or curiovirus* or curtovirus* or cvm10virus* or cyclovirus* or cypovirus* or cyprinivirus* or cystovirus* or cytomegalovirus* or cytorhabdovirus* or d3112virus* or d3virus* or debiartevirus* or decacovirus* or decronivirus* or decurrovirus* or deltaarterivirus* or deltabaculovirus* or deltacoronavirus* or deltaflexivirus* or deltainfluenzavirus* or deltalipothrixvirus* or deltapapillomavirus* or deltapartitivirus* or deltapolyomavirus* or deltaretrovirus* or deltatorquevirus* or deltavirus* or demosthenesvirus* or densovirus* or dependoparvovirus* or dfl12virus* or dianthovirus* or diatodnavirus* or dichorhavirus* or dicipivirus* or dinodnavirus* or dinornavirus* or dinovernavirus* or divavirus* or doucettevirus* or dragsmacovirus* or drosmacovirus* or drosmacovirus*2 or dumedivirus* or duvinacovirus* or dyochipapillomavirus* or dyodeltapapillomavirus* or 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gammasphaerolipovirus* or gammatorquevirus* or gemycircularvirus* or gemyduguivirus* or gemygorvirus* or gemykibivirus* or gemykolovirus* or gemykrogvirus* or gemykroznavirus* or gemytondvirus* or gemyvongvirus* or giardiavirus* or gilesvirus* or globulovirus* or glossinavirus* or goravirus* or gordonvirus* or gordtnkvirus* or goukovirus* or grablovirus* or granulovirus* or gyrovirus* or habenivirus* or hanalivirus* or hapavirus* or hapunavirus* or harkavirus* or harrisonvirus* or hartmanivirus* or hawkeyevirus* or hedartevirus* or hemivirus* or henipavirus* or hepacivirus* or hepandensovirus* or hepatovirus* or herbevirus* or herdecovirus* or herpesvirus* or hibecovirus* or higrevirus* or hk578virus* or hk97virus* or hordeivirus* or horwuvirus* or hp1virus* or hubavirus* or huchismacovirus* or hudivirus* or hudovirus* or hunnivirus* or hupolycivirus* or hypovirus* or hytrovirus* or ichnovirus* or ichtadenovirus* or ictalurivirus* or idaeovirus* or idnoreovirus* or iflavirus* or 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or limnipivirus* or lincruvirus* or lineavirus* or lit1virus* or lmd1virus* or loanvirus* or lolavirus* or luchacovirus* or luteovirus* or luz24virus* or luz7virus* or lymphocryptovirus* or lymphocystivirus* or lyssavirus* or m12virus* or macanavirus* or macavirus* or machinavirus* or machlomovirus* or macluravirus* or macronovirus* or maculavirus* or mamastrovirus* or mammarenavirus* or mandarivirus* or marafivirus* or marburgvirus* or mardivirus* or marnavirus* or marseillevirus* or marthavirus* or marvinvirus* or mastadenovirus* or mastrevirus* or mavirus* or megabirnavirus* or megalocytivirus* or megrivirus* or menolivirus* or merbecovirus* or metapneumovirus* or metavirus* or milecovirus* or mimivirus* or mimoreovirus* or minacovirus* or minunacovirus* or mischivirus* or mitartevirus* or mitovirus* or mivirus* or mobatvirus* or mobuvirus* or molluscipoxvirus* or mooglevirus* or moonvirus* or moordecovirus* or morbillivirus* or mosavirus* or msw3virus* or muarterivirus* or mudcatvirus* or mupapillomavirus* or muromegalovirus* or muscavirus* or muvirus* or mycoflexivirus* or mycoreovirus* or myohalovirus* or myotacovirus* or n15virus* or n4virus* or namcalivirus* or nanovirus* or narnavirus* or nebovirus* or nepovirus* or nidovirus* or nit1virus* or nobecovirus* or nona33virus* or nonagvirus* or nonanavirus* or norovirus* or novirhabdovirus* or np1virus* or nucleopolyhedrovirus* or nucleorhabdovirus* or nudivirus* or nupapillomavirus* or nyavirus* or nyctacovirus* or nyfulvavirus* or nymphadoravirus* or ofalivirus* or okavirus* or oleavirus* or omegapapillomavirus* or omegatetravirus* or omegavirus* or omikronpapillomavirus* or oncotshavirus* or oncovirus* or ophiovirus* or orbivirus* or orinovirus* or orivirus* or orthobornavirus* or orthobunyavirus* or orthohantavirus* or orthohepadnavirus* or orthohepevirus* or orthonairovirus* or orthophasmavirus* or orthopneumovirus* or orthopoxvirus* or orthoreovirus* or oryzavirus* or oscivirus* or ostreavirus* or ourmiavirus* or p100virus* or p12002virus* or p12024virus* or p1virus* or p22virus* or p23virus* or p2virus* or p68virus* or p70virus* or pa6virus* or pagevirus* or paguronivirus* or pakpunavirus* or pamx74virus* or panicovirus* or papanivirus* or parapoxvirus* or parechovirus* or partitivirus* or pasivirus* or passerivirus* or patiencevirus* or pbi1virus* or pbunavirus* or pecluvirus* or pedacovirus* or pedartevirus* or pegivirus* or pelarspovirus* or penstyldensovirus* or pepy6virus* or percavirus* or perhabdovirus* or peropuvirus* or pestivirus* or petuvirus* or pfr1virus* or pg1virus* or phaeovirus* or phasivirus* or phayoncevirus* or phi29virus* or phic31virus* or phicbkvirus* or phieco32virus* or phietavirus* or phifelvirus* or phijl1virus* or phikmvvirus* or phikzvirus* or phipapillomavirus* or phix174microvirus* or phlebovirus* or phytoreovirus* or picobirnavirus* or pidchovirus* or pipapillomavirus* or pipefishvirus* or pis4avirus* or piscihepevirus* or planidovirus* or plasmavirus* or platypuvirus* or plectrovirus* or plotvirus* or poacevirus* or pocjvirus* or polemovirus* or polerovirus* or polyomavirus* or pomovirus* or porprismacovirus* or potamipivirus* or potexvirus* or potyvirus* or pradovirus* or prasinovirus* or pregotovirus* or proboscivirus* or prosimiispumavirus* or protobacilladnavirus* or protoparvovirus* or prtbvirus* or prunevirus* or prymnesiovirus* or psavirus* or pseudovirus* or psimunavirus* or psipapillomavirus* or quadrivirus* or quaranjavirus* or r4virus* or rabovirus* or ranavirus* or raphidovirus* or rb49virus* or rb69virus* or rdjlvirus* or redivirus* or renitovirus* or reovirus* or reptarenavirus* or rer2virus* or respirovirus* or retrovirus* or reyvirus* or rhadinovirus* or rheph4virus* or rhinacovirus* or rhinovirus* or rhizidiovirus* or rhopapillomavirus* or robigovirus* or rogue1virus* or rosadnavirus* or rosavirus* or rosebushvirus* or roseolovirus* or rotavirus* or roymovirus* or rsl2virus* or rslunavirus* or rtpvirus* or rubivirus* or rubulavirus* or rudivirus* or rymovirus* or s16virus* or sadwavirus* or saetivirus* or sakobuvirus* or salivirus* or salmonivirus* or salterprovirus* or sap6virus* or sapelovirus* or sapovirus* or sarbecovirus* or schizot4virus* or sclerodarnavirus* or sclerotimonavirus* or scutavirus* or se1virus* or seadornavirus* or sectovirus* or secunda5virus* or semotivirus* or send513virus* or senecavirus* or sengalvirus* or sep1virus* or septima3virus* or sequivirus* or setracovirus* or seuratvirus* or sextaecvirus* or sfi11virus* or sfi21dt1virus* or shanbavirus* or shangavirus* or shaspivirus* or sheartevirus* or siadenovirus* or sicinivirus* or sigmapapillomavirus* or sigmavirus* or silviavirus* or simiispumavirus* or simplexvirus* or sinaivirus* or sirevirus* or sitaravirus* or sk1virus* or slashvirus* or smoothievirus* or sobemovirus* or socyvirus* or solendovirus* or sopolycivirus* or soupsvirus* or soymovirus* or sp18virus* or sp31virus* or sp58virus* or sp6virus* or spbetavirus* or spiromicrovirus* or spn3virus* or spo1virus* or sprivivirus* or sputnikvirus* or sripuvirus* or ssp2virus* or striwavirus* or suipoxvirus* or sunshinevirus* or suspvirus* or svunavirus* or t1virus* or t4virus* or t5virus* or t7virus* or tankvirus* or tapwovirus* or taupapillomavirus* or tegacovirus* or tenuivirus* or tepovirus* or teschovirus* or tetraparvovirus* or tg1virus* or thetaarterivirus* or thetapapillomavirus* or thetatorquevirus* or thogotovirus* or thottimvirus* or tibrovirus* or tilapinevirus* or tin2virus* or tipravirus* or tiruvirus* or titanvirus* or tl2011virus* or tlsvirus* or tm4virus* or tobamovirus* or tobravirus* or tombusvirus* or topocuvirus* or torchivirus* or torovirus* or torradovirus* or tospovirus* or totivirus* or toursvirus* or tp21virus* or tp84virus* or treisdeltapapillomavirus* or treisepsilonpapillomavirus* or treisetapapillomavirus* or treisiotapapillomavirus* or treiskappapapillomavirus* or treisthetapapillomavirus* or treiszetapapillomavirus* or tremovirus* or triatovirus* or triavirus* or trichomonasvirus* or trichovirus* or trigintaduovirus* or tritimovirus* or tsarbombavirus* or tungrovirus* or tunisvirus* or tupavirus* or turncurtovirus* or turrinivirus* or twortvirus* or tymovirus* or umbravirus* or una4virus* or una961virus* or upsilonpapillomavirus* or v5virus* or varicellovirus* or varicosavirus* or vegasvirus* or velarivirus* or vendettavirus* or vesiculovirus* or vesivirus* or vespertiliovirus* or vhmlvirus* or vi1virus* or victorivirus* or virtovirus* or virus* or vitivirus* or vp5virus* or waikavirus* or wbetavirus* or wenilivirus* or whispovirus* or wildcatvirus* or wizardvirus* or woesvirus* or wphvirus* or wubeivirus* or wuhivirus* or wumivirus* or xipapillomavirus* or xp10virus* or yatapoxvirus* or ydn12virus* or yingvirus* or yuavirus* or yuyuevirus* or zeavirus* or zetaarterivirus* or zetapapillomavirus* or zetatorquevirus*).mp.

11. ("2019 ncov" or "2019nCoV" or "covid 19" or "severe acute respiratory syndrome coronavirus 2" or "sars cov 2").mp.

12. or/7-11

13. 6 and 12

14. meta-analysis.pt.

15. meta-analysis/ or systematic review/ or meta-analysis as topic/ or "meta analysis (topic)"/ or "systematic review (topic)"/ or exp technology assessment, biomedical/

16. ((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab,kw.

17. ((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab,kw.

18. ((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab,kf,kw.

19. (data synthes* or data extraction* or data abstraction*).ti,ab,kf,kw.
20. (handsearch* or hand search*).ti,ab,kf,kw.
21. (mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab,kf,kw.
22. (met analy* or metanaly* or technology assessment* or HTA or HTAs or technology overview* or technology appraisal*).ti,ab,kf,kw.
23. (meta regression* or metaregression*).ti,ab,kf,kw.
24. (meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw.
25. (medline or cochrane or pubmed or medlars or embase or cinahl).ti,ab,hw.
26. (cochrane or (health adj2 technology assessment) or evidence report).jw.
27. (comparative adj3 (efficacy or effectiveness)).ti,ab,kf,kw.
28. (outcomes research or relative effectiveness).ti,ab,kf,kw.
29. ((indirect or indirect treatment or mixed-treatment) adj comparison*).ti,ab,kf,kw.
30. or/14-29
31. (Randomized Controlled Trial or Controlled Clinical Trial or Pragmatic Clinical Trial or Equivalence Trial or Clinical Trial, Phase III).pt.
32. Randomized Controlled Trial/
33. exp Randomized Controlled Trials as Topic/
34. "Randomized Controlled Trial (topic)"/
35. Controlled Clinical Trial/ or exp Controlled Clinical Trials as Topic/ or "Controlled Clinical Trial (topic)"/ or Randomization/ or Random Allocation/ or Double-Blind Method/ or Double Blind Procedure/ or Double-Blind Studies/ or Single-Blind Method/ or Single Blind Procedure/ or Single-Blind Studies/ or Placebos/ or Placebo/ or Control Groups/ or Control Group/
36. (random* or sham or placebo*).ti,ab,hw,kf,kw.
37. ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw.
38. ((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kf,kw.
39. (control* adj3 (study or studies or trial* or group*)).ti,ab,kf,kw.
40. (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kw.
41. allocated.ti,ab,hw.
42. ((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kw.
43. ((equivalence or superiority or non-inferiority or noninferiority) adj3 (study or studies or trial*)).ti,ab,hw,kw.
44. (pragmatic study or pragmatic studies).ti,ab,hw,kw.
45. ((pragmatic or practical) adj3 trial*).ti,ab,hw,kw.
46. ((quasiexperimental or quasi-experimental) adj3 (study or studies or trial*)).ti,ab,hw,kw.
47. (phase adj3 (III or "3") adj3 (study or studies or trial*)).ti,hw,kw.
48. or/31-47
49. Epidemiologic Studies/ or exp Case Control Studies/ or exp Cohort Studies/
50. (case control or (cohort adj (study or studies)) or cohort analy$ or (follow up adj (study or studies)) or longitudinal or retrospective or cross sectional).tw.
51. Cross-Sectional Studies/
52. or/49-51
53. 30 or 48 or 52
54. pc.fs.
55. Infection Control/ or exp Infection Control, Dental/
56. (prevent* or control* or mitigat* or minimi?e or reduce or reduction or intervention? or combat*).ti.
57. 54 or 55 or 56
58. 6 and 12 and 53
59. 57 and 58
60. 55 or 56
61. 58 and 60
62. coronaviridae infections/ or coronavirus infections/ or exp severe acute respiratory syndrome/
63. 11 or 62
64. 6 and 53 and 60
65. 63 and 64
66. (prevent* or control* or mitigat* or minimi?e or reduce or reduction or intervention?).ti,ab.
67. 55 or 66
68. 58 and 67
69. 6 and 53 and 63

Key area H

1. exp Stomatognathic Diseases/
2. exp Dentistry/
3. exp Oral Health/
4. exp Dental Facilities/
5. (dentist* or endodont* or orthodonti* or periodont* or prosthodont* or apicoectom* or gingivectom* or gingivoplast* or glossectom* or "mandibular advancement" or alveolectom* or alveoloplast* or vestibuloplast* or "root canal" or oral or oropharyng* or temporomandibular or TMJ or jaw or jaws or mandibular or maxillofacial or mandible* or maxilla* or "alveolar ridge" or dental or orthognathic or tooth or teeth or occlusion or malocclusion or mal-occlusion or odontolog* or tongue* or glossal or buccal or palatal or palate or palates or labial or lip or lips or gingiva* or gingiviti*).tw,kf.
6. or/1-5
7. exp Viruses/
8. exp Virus Diseases/
9. (viridae or COVID-19 or AIDS or HIV or ebola or zika or "west nile" or shingles or SARS or MERS or chickenpox or smallpox or Chikungunya or epstein-

barr or erythema or exanthum or influenza? or flu or HFMD or "heartland virus" or HFRS or hepatitis or herpes or cmeasles or mumps or "nipah virus" or Poliomyelitis or yersiniosis or rubella or salmonellosis or rabies).tw,kf.

10. (aalivirus* or ab18virus* or abouovirus* or abyssovirus* or acadianvirus* or ag3virus* or agatevirus* or agrican357virus* or aichivirus* or albetovirus* or alefpapillomavirus* or alfamovirus* or allexivirus* or allolevivirus* or almendravirus* or alpha3microvirus* or alphaabyssovirus* or alphaarterivirus* or alphabaculovirus* or alphacarmotetravirus* or alphacarmovirus* or alphacoronavirus* or alphaendornavirus* or alphaentomopoxvirus* or alphafusellovirus* or alphaguttavirus* or alphaherpesvirus* or alphainfluenzavirus* or alphaletovirus* or alphamesonivirus* or alphamononivirus* or alphanecrovirus* or alphanodavirus* or alphanudivirus* or alphapapillomavirus* or alphapartitivirus* or alphapermutotetravirus* or alphapleolipovirus* or alphapolyomavirus* or alphaportoglobovirus* or alpharetrovirus* or alphasphaerolipovirus* or alphaspiravirus* or alphatectivirus* or alphatorquevirus* or alphatristromavirus* or alphaturrivirus* or alphavirus* or amalgavirus* or ambidensovirus* or 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11. ("2019 ncov" or "2019nCoV" or "covid 19" or "severe acute respiratory syndrome coronavirus 2" or "sars cov 2").mp.
12. or/7-11
13. 6 and 12
14. Ventilation/
15. Air Pollution, Indoor/
16. ((high-volume adj1 evacuat*) or HEPA).tw,kf.
17. ((high-volume adj3 (evacuat* or filter?)) or HEPA or HVE).tw,kf.
18. ventilat*.tw,kf.
19. air exchange.tw,kf.
20. filter?.tw,kf.
21. or/14-20
22. 13 and 21

Key area I

1. exp Stomatognathic Diseases/
2. exp Dentistry/
3. exp Oral Health/
4. exp Dental Facilities/
5. (dentist* or endodont* or orthodonti* or periodont* or prosthodont* or apicoectom* or gingivectom* or gingivoplast* or glossectom* or "mandibular advancement" or alveolectom* or alveoloplast* or vestibuloplast* or "root canal" or oral or oropharyng* or temporomandibular or TMJ or jaw or jaws or mandibular or maxillofacial or mandible* or maxilla* or "alveolar ridge" or dental or orthognathic or tooth or teeth or occlusion or malocclusion or mal-occlusion or odontolog* or tongue* or glossal or buccal or palatal or palate or palates or labial or lip or lips or gingiva* or gingiviti*).tw,kf.
6. or/1-5
7. exp Viruses/
8. exp Virus Diseases/
9. (viridae or COVID-19 or AIDS or HIV or ebola or zika or "west nile" or shingles or SARS or MERS or chickenpox or smallpox or Chikungunya or epstein-barr or erythema or exanthum or influenza? or flu or HFMD or "heartland virus" or HFRS or hepatitis or herpes or cmeasles or mumps or "nipah virus" or Poliomyelitis or yersiniosis or rubella or salmonellosis or rabies).tw,kf.
10. (aalivirus* or ab18virus* or abouovirus* or abyssovirus* or acadianvirus* or ag3virus* or agatevirus* or agrican357virus* or aichivirus* or albetovirus* or alefpapillomavirus* or alfamovirus* or allexivirus* or allolevivirus* or almendravirus* or alpha3microvirus* or alphaabyssovirus* or alphaarterivirus* or

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orthohepevirus* or orthonairovirus* or orthophasmavirus* or orthopneumovirus* or orthopoxvirus* or orthoreovirus* or oryzavirus* or oscivirus* or ostreavirus* or ourmiavirus* or p100virus* or p12002virus* or p12024virus* or p1virus* or p22virus* or p23virus* or p2virus* or p68virus* or p70virus* or pa6virus* or pagevirus* or paguronivirus* or pakpunavirus* or pamx74virus* or panicovirus* or papanivirus* or parapoxvirus* or parechovirus* or partitivirus* or pasivirus* or passerivirus* or patiencevirus* or pbi1virus* or pbunavirus* or pecluvirus* or pedacovirus* or pedartevirus* or pegivirus* or pelarspovirus* or penstyldensovirus* or pepy6virus* or percavirus* or perhabdovirus* or peropuvirus* or pestivirus* or petuvirus* or pfr1virus* or pg1virus* or phaeovirus* or phasivirus* or phayoncevirus* or phi29virus* or phic31virus* or phicbkvirus* or phieco32virus* or phietavirus* or phifelvirus* or phijl1virus* or phikmvvirus* or phikzvirus* or phipapillomavirus* or phix174microvirus* or 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robigovirus* or rogue1virus* or rosadnavirus* or rosavirus* or rosebushvirus* or roseolovirus* or rotavirus* or roymovirus* or rsl2virus* or rslunavirus* or rtpvirus* or rubivirus* or rubulavirus* or rudivirus* or rymovirus* or s16virus* or sadwavirus* or saetivirus* or sakobuvirus* or salivirus* or salmonivirus* or salterprovirus* or sap6virus* or sapelovirus* or sapovirus* or sarbecovirus* or schizot4virus* or sclerodarnavirus* or sclerotimonavirus* or scutavirus* or se1virus* or seadornavirus* or sectovirus* or secunda5virus* or semotivirus* or send513virus* or senecavirus* or senegalvirus* or sep1virus* or septima3virus* or sequivirus* or setracovirus* or seuratvirus* or sextaecvirus* or sfi11virus* or sfi21dt1virus* or shanbavirus* or shangavirus* or shaspivirus* or sheartevirus* or siadenovirus* or sicinivirus* or sigmapapillomavirus* or sigmavirus* or silviavirus* or simiispumavirus* or simplexvirus* or sinaivirus* or sirevirus* or sitaravirus* or sk1virus* or slashvirus* or smoothievirus* or sobemovirus* or socyvirus* or solendovirus* or sopolycivirus* or soupsvirus* or soymovirus* or sp18virus* or sp31virus* or sp58virus* or sp6virus* or spbetavirus* or spiromicrovirus* or spn3virus* or spo1virus* or sprivivirus* or sputnikvirus* or sripuvirus* or ssp2virus* or striwavirus* or suipoxvirus* or sunshinevirus* or suspvirus* or svunavirus* or t1virus* or t4virus* or t5virus* or t7virus* or tankvirus* or tapwovirus* or taupapillomavirus* or tegacovirus* or tenuivirus* or tepovirus* or teschovirus* or tetraparvovirus* or tg1virus* or thetaarterivirus* or thetapapillomavirus* or thetatorquevirus* or thogotovirus* or thottimvirus* or tibrovirus* or tilapinevirus* or tin2virus* or tipravirus* or tiruvirus* or titanvirus* or tl2011virus* or tlsvirus* or tm4virus* or tobamovirus* or tobravirus* or tombusvirus* or topocuvirus* or torchivirus* or torovirus* or torradovirus* or tospovirus* or totivirus* or toursvirus* or tp21virus* or tp84virus* or 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yingvirus* or yuavirus* or yuyuevirus* or zeavirus* or zetaarterivirus* or zetapapillomavirus* or zetatorquevirus*).mp.
11. ("2019 ncov" or "2019nCoV" or "covid 19" or "severe acute respiratory syndrome coronavirus 2" or "sars cov 2").mp.
12. or/7-11
13. exp Fomites/
14. Equipment Contamination/
15. (surface? or fomite?).tw,kf,mp.
16. (dentist? or dental? or maxillofacial or endodont* or orthodonti* or periodont* or prosthodont*).tw,kf.
17. 1 or 2 or 3 or 4 or 16
18. (countertop? or counter top? or cabinet* or cupboard? or floor? or wall? or sink? or handles or switch or switches or knob? or doorknob? or faucet? or tap or taps or resusable container? or radiograph* or door? or drawer? or carpet* or fabric* or upholster*).tw,kf,mp.
19. 13 or 14 or 18
20. 12 and 17 and 19
21. 13 or 14 or 15 or 18
22. 12 and 17 and 21
23. 12 and 15 and 17
24. 22 not 23