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.

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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FOREWORD

by Dr James Taylor, Chief Dental Officer of Canada

Canadian oral health practitioners are returning to practice in a very different environment to the one they left prior to the onset of the COVID-19 pandemic, particularly in the domain of infection control and prevention. Oral health professional organizations, institutions, regulatory bodies and those in clinical care settings, in all Canadian jurisdictions, are making decisions each day on how to best care for patients and guide the professions in the context of the return to clinical practice during the pandemic. Further, they are having to make these decisions in a highly complex, rapidly evolving environment, based at times on incomplete scientific information.

In light of this, the Office of the Chief Dental Officer of Canada (OCDOC) commissioned McGill University to draft a comprehensive knowledge product concerning key issues that inform the provision of oral health care by relevant providers in Canada during the COVID-19 pandemic. Around this work, the OCDOC then convened a representative multidisciplinary knowledge-based group from the national oral health professional and federal government health domains. The group's role was to work collaboratively to contribute to the generation a single high-level national document on the current evidence by the team from McGill. This document will then reside in the public domain to be accessible to decision makers as they carry out their respective responsibilities.

The participants in this collaboration included:

NATIONAL ORGANIZATION
Public Health Agency of Canada
Health Canada – COVID-19 Task Force
Federation of Dental Hygiene Regulators of Canada,
Canadian Dental Regulatory Authorities Federation
Canadian Dental Assisting Regulatory Authorities
Canadian Alliance of Dental Technology Regulators
Canadian Dental Association
Denturist Association of Canada
Canadian Dental Assistants Association
Canadian Dental Hygienists Association
Association of Canadian Faculties of Dentistry

The OCDOC will have this document updated several times over the course of 2020-2021, in order to capture the rapidly evolving knowledge base in this area. Evidence gaps identified during this process will be identified to the Canadian Institutes of Health Research by the OCDOC, with a recommendation for priority research funding consideration in these areas.

OCDOC Mandate: to advance population-level oral health through health promotion, disease prevention and professional/technical guidance with an emphasis on vulnerable populations.

Background

Oral health professional organizational, institutional, clinical and other leaders, including frontline dental professionals treating patients, in all Canadian jurisdictions, are making decisions each day on how to best manage patients and guide the professions in the context of the return to clinical practice during the COVID-19 pandemic. These people and organizations are making decisions in a very fast-moving crisis with a changing environment and multiple, evolving sources of information. These decisions are made based on instructions and guidelines from governments and other legal entities (such as regulatory authorities), on scientific data and evidence, on expert opinion and on prioritized needs. They also include health care, economic, ethical and other important elements, while also recognizing the information and advice upon which decisions are made is often imperfect, incomplete and/or otherwise limited. In short, oral health professional decision-makers at all levels are making decisions and providing advice and guidance in a highly complex, rapidly evolving environment, based often on imperfect and incomplete information.

A second contextual observation is that across all jurisdictions in Canada, dentists, dental hygienists, dental assistants, denturists, and dental therapists, the vast majority of whom practice in private offices (versus public facilities), were advised or mandated by their regulatory bodies to cease all routine and elective care and only provide emergent/urgent care in March 2020. As of May 4th, 2020, the first Provincial/Territorial government activated a plan to "re-open" their jurisdiction, including oral health care, and other jurisdictions soon followed. However, oral health practitioners are returning to practice in a very different environment, particularly in the domain of infection control and prevention, to the one they left prior to the onset of the pandemic in Canada.

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.

Specific objectives

1. Conduct a 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 dental professionals should screen for prior to providing in-person oral 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. Prepare a written report documenting the findings of the aforementioned literatures searches. The report will be 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

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 2000 to June 30th, 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 were also included in this 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 research 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 will briefly justify the importance of the topic in the context of oral health care provision in the pandemic and then summarize the findings, 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. Finally, 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.

Report summary

The searches identified strong evidence for a number of conditions that increase the risk of individuals diagnosed with COVID-19 having potentially serious consequences such as hospitalization, ventilation and mortality. These conditions are hypertension, diabetes, cardiovascular and coronary artery disease, chronic respiratory diseases, kidney disease and liver disease. There is also strong evidence that people aged 65 years or older are at similar risk. The evidence concerning sex-related risk is however equivocal. Strong evidence also exists concerning the most common signs and symptoms of COVID-19, which are fever, cough, fatigue and muscle aches and shortness of breath. All these factors and others listed in the summaries below should be considered as part of the pre-treatment screening strategies used by oral health professionals.

In reviewing evidence for non-treatment management of in-person care episodes during the pandemic, there was little evidence directly related to the topic in dental care settings. However, we identified evidence regarding aerosolization in health care settings, supporting the use of N95 respirators, surgical masks and eye protection by staff and showing that influenza virus is the most commonly transmitted disease in long term care facilities so good infection control measures need to be in place to prevent transmission of this and similar viruses. We also identified research raising questions concerning infection control measures in place in dental laboratories and work identifying the need for training of professionals and compliance with infection control protocols. We also highlight the possibility of using teledentistry for certain forms of health care as an alternative to in-person care.

With respect to the use of PPE by professionals providing care, the available evidence is of limited strength but shows that N95 respirators and surgical masks are equivalent at least in the provision of non-aerosol generating procedures and that training personnel in the donning and doffing of PPE is important in reducing contamination. The discomfort of various forms of PPE, including N95 respirators, is mentioned as contributing to them being less effective than perhaps expected. We identified good evidence that N95 respirators can be disinfected with vapourized hydrogen peroxide for one re-use but no evidence to support re-use of surgical masks.

With respect to the use of aerosol-generating procedures (AGPs), the evidence was not strong. We identified one study reporting a large increase in bioaerosol in dental clinics during the work period

and a subsequent fall once that work had finished, plus other work confirming a broad range of pathogens in bioaerosols in health care settings, including dental offices. No evidence was available concerning the risk of transmission or contamination with dental AGPs.

With respect to mitigating strategies during dental procedures, the strongest evidence was identified supporting the use of chlorhexidine as a pre-procedural mouth rinse to reduce bacteria in bioaerosols prior to dental procedures. This was supported by oral chlorhexidine preventing pneumonia and other respiratory morbidity in ventilated and cardiac surgery patients. It is interesting to note that a very recently published Cochrane rapid review of international guidelines concerning AGPs and their mitigation in dental care stated: "There is a lack of evidence provided to support the majority of recommendations in the documents."[1]

Our review of ventilation systems found that sophisticated systems used in hospitals reduce bioaerosol levels and that ventilation systems can reduce the transmission of infectious diseases, although it is not clear what specific ventilation strategies are effective in different settings. And our review of the disinfection of inanimate surfaces demonstrated that many pathogens including viruses can remain viable on such surfaces for days if disinfection strategies are not used. Our search identified chlorine-based disinfectants as effective, although it is not clear what concentrations are required for different surface types.

Finally, as a general observation, we identified several studies that highlighted the importance and the need for training in a variety of elements of infection control. Given the provision of oral health care in Canada is concentrated in thousands of small offices with small staff numbers, and given the significant changes already incorporated, plus those that will be necessary as more research emerges, oral health professions across Canada need to give careful and urgent consideration of revised and on-going infection control training for their members and trainees.

Report results

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?**

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 be infected.

Summary of findings

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[2-9]. 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[3-7]. Two more systematic reviews provided strong evidence that people with chronic kidney disease are at increased risk of severe COVID-19[10,11], with one of these reviews noting that the SARS-CoV-2 virus can directly affect the kidneys leading to acute renal injury and mortality[10]. 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[10], while another reported weaker evidence of liver damage through COVID-19[12]. 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[13]. 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[14].

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[15-19]. 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[5,9] but the evidence for sex was more equivocal with one systematic review concluding that males were at greater risk for severe disease[9] while another found no difference between sexes[5]. Finally, one systematic review noted that children are often asymptomatic but can transmit COVID-19[20].

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/diseases/2019-novel-coronavirus-infection/guidance-documents/signs-symptoms-severity.html#toc1

For more detailed information on the evidence supporting this section, see Appendix A

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

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%)[5,7,21-24]. One other systematic review providing strong evidence[23] and a scoping review providing weaker evidence[24] also reported patients with sputum (28%) headache (8-12%), sore throat (10%) and gastrointestinal symptoms (9%), including diarrhoea (6-7%)[5,24]. 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[25,26], 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[15-17]. 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[27]. 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[27]. Interestingly, a systematic review concerning MERS-CoV reported that children were more likely to be asymptomatic[28].

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

For more detailed information on the evidence supporting this section, see Appendix B

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

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[29]. 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[30]. 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[31]. 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[32]. 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[32].

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[33].

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[34].

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"[35]. 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[36,37]. 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).

For more detailed information on the evidence supporting this section, see Appendix C

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?

While the precise means of SARS-CoV-2 transmission remain unclear, the available evidence suggests strongly that aerosol, droplet and transmission via fomites (e.g. clothes, furniture or other surfaces) are possible routes. 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

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[38]. 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[39]. 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[40]. 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[30]. 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[32].

For more detailed information on the evidence supporting this section, see Appendix D

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 the findings

We identified two recently published systematic reviews[41,42] and one scoping review[43] concerning the decontamination and re-use N95 respirators plus a systematic review investigating the same for surgical masks[44]. All were published in 2020. With respect to N95 respirators, the scoping review concluded that the evidence supporting N95 respirator decontamination is sparce but that vaporized hydrogen peroxide and ultra-violet light are the most commonly cited means in the literature[43]. 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[41]. The other systematic review concluded that a single cycle of vaporized hydrogen peroxide successfully removes pathogens without creating a safety problem for the user[42]. 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[42].

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[44].

For more detailed information on the evidence supporting this section, see Appendix E

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

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[45]. 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[46].

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[47]. 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[48].

For more detailed information on the evidence supporting this section, see Appendix F

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

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[49]. 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[50].

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[51]. 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[52]. 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[53].

Finally, we note a Cochrane review protocol recently published concerning work that is highly relevant to this topic[54]. 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.

For more detailed information on the evidence supporting this section, see Appendix G

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

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[55]. 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[55]. 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[56].

For more detailed information on the evidence supporting this section, see Appendix H

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

A 2006 systematic review summarized data concerning the persistence of nosocomial pathogens on inanimate surfaces[57]. 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[58].

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[59].

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[60].

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[61]. 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.

Finally, 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.html).

For more detailed information on the evidence supporting this section, see Appendix I

ETHICAL CONSIDERATIONS OF PROVIDING ORAL HEALTH CARE DURING A PANDEMIC

It is clear through this report that while some elements of the topics discussed have strong evidence to support certain approaches, other topics only have only weak evidence, or the evidence is not directly relevant and a degree of interpretation to oral health care in the COVID-19 pandemic is necessary. And in some areas, there is no evidence at the level of quality that we could identify. Again, this does not mean there is no evidence at all, but it means that evidence that may be identified using other quality criteria may have significant biases, thereby reducing the confidence we have in that evidence. Given these observations but also given the need for health care professionals, including oral health care professionals and their professional organizations, to make decisions concerning patient care and guidelines for patient care, it is important to consider appropriate ethical principles. A reminder of such principles and how they should be used by public health professionals in the pandemic are provided on the Health Canada website (https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/canadas-reponse/ethics-framework-guide-use-response-covid-19-pandemic.html).

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 chance of: (i) severe COVID-19 (odds: 3.1x greater) (ii) COVID-19 mortality (odds: 11.0x greater)	SR: *Aggarwal et al. (1)*
	Higher chance of severe COVID-19 (odds: 3.4x greater)	SR: *Yang et al. (7)*
	Higher chance of severe COVID-19 (odds: 5.2x greater)	SR: *Zheng et al. (8)*
Hypertension	Higher risk for: (i) COVID-19-related cardiac injury (linked to higher mortality – risk: 3.9x)	SR: *Li et al. (3)*
	Higher risk for: (i) severe COVID-19 (risk: 2.0x) (ii) COVID-19 mortality (risk: 2.2x) (iii) need for ICU (risk: 2.1x)	SR: *Pranata et al. (5)*
	Combined with diabetes: 2.6x odds for severe COVID-19	SR: *Liu et al. (4)*
	Higher chance of severe COVID-19 (odds: 2.3x greater)	SR: *Yang et al. (7)*
	Higher chance of death (odds: 2.5x greater)	SR: *Tian et al. (6)*
	Higher chance of severe COVID-19 (odds: 2.7x greater)	SR: *Zheng et al. (8)*
Coronary heart disease	Higher chance of death (odds: 3.8x greater)	SR: *Tian et al. (6)*
Chronic obstructive pulmonary disease	Higher risk for: (i) severe COVID-19 (risk: 1.9x) (ii) COVID-19 mortality (60% more)	SR: *Alqahtani et al. (2)*
Chronic pulmonary disease	Combined with hypertension: 4.2x odds for severe COVID-19	SR: *Liu et al. (4)*
Respiratory disease, general	Higher chance of severe COVID-19 (odds: 3.5x greater)	SR: Y*ang et al. (7)*

	Higher chance of severe COVID-19 (odds: 5.1x greater)	SR: *Zheng et al. (8)*
Smoking, current	1.45x more severe complications, mortality rate of mortality rate of 38.5%.	SR: *Alqahtani et al. (2)*
	Higher chance of severe COVID-19 (odds: 2.51x greater)	SR: *Zheng et al. (8)*
Diabetes mellitus	Higher chance of death (odds: 2.0x greater)	SR: *Tian et al. (19)*
	Higher chance of severe COVID-19 (odds: 3.7x greater)	SR: *Zheng et al. (8)*
Chronic kidney diseases	Higher COVID-19 severity (84% of 56 cases) and mortality (53% of 15 cases)	SR: *Oyelade et al. (9)*
Acute kidney injury	Observed in 7.58% of COVID-19 patients (mortality rate: 93.27%)	SR: *Chan et al. (10)*
Liver diseases	Higher COVID-19 severity (57% of 75 cases) and mortality (18% of 34 cases)	SR: *Oyelade et al. (9)*
Limited evidence		
Pregnancy: Women's and perinatal/neonatal health	(i) Miscarriage: 04/324 cases (1.2%); (ii) transmission to neonate: 03/155 cases (1.9%)	SR: *Juan et al. (14)*
	No maternal death or transmission to neonate (89 cases)	SR: *Muhidin et al. (15)*
	No maternal death and 03 admissions to ICU; Neonatal and intrauterine deaths: 01 each (108 cases)	SR: *Zaigham & Andersson (16)*
	Women: no serious symptoms and unlike transmission to child (inconclusive findings)	Scoping Review: *Caparros-Gonzalez (17)*
	Transmission to 179 neonates (mothers infected close to childbirth): 5 PCR-positive, 3 with SARS-CoV-2 IgM, 8 suspected	Cohort Study: *Egloff et al. (18)*
Liver diseases	Possible hepatic anomalies caused by COVID-19 (blood biomarkers and histopathology)	SR: *Kukla et al. (11)*
Nervous system	Incidence of secondary neurologic complications ranging from 6% to 36.4%	Scoping Review: *Herman et al. (12)*

Immunosuppressed patients	Immunosuppression does not seem to increase the risk for severe COVID-19	SR: *Minotti et al. (13)*
Children	Probably lower viral levels and symptoms than adults; unlikely cause for an outbreak	SR: *Ludvigsson, J. F.(19)*

*SR: Systematic review

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

Sign/symptom	Frequency	Source
Strong evidence		
Fever	79 to 91%	SR: *Rodriguez-Morales et al.* (22); *Fu et al.* (19); *Hu et al.* (20); *Liu et al.* (4); *Yang et al.* (7); Scoping review: *Borges do Nascimento et a*l., (21)
Cough	58 to 68%	SR: *Rodriguez-Morales et al.* (22); *Fu et al.* (19); *Hu et al.* (20); *Liu et al.* (4); *Yang et al.* (7); Scoping review: *Borges do Nascimento et a*l., (21)
Dyspnea/shortness of breath	21 to 46%	SR: *Rodriguez-Morales et al.* (22); *Fu et al.* (19); *Hu et al.* (20); *Liu et al.* (4); *Yang et al.* (7); Scoping review: *Borges do Nascimento et a*l., (21)
Myalgia or fatigue	29 to 51%	SR: *Rodriguez-Morales et al.* (22); *Fu et al.* (19); *Hu et al.* (20); *Liu et al.* (4); *Yang et al.* (7); Scoping review: *Borges do Nascimento et a*l., (21)
Sputum	28%	SR: *Rodriguez-Morales et al.* (22)
Sore throat	10 to 11%	SR: *Rodriguez-Morales et al. (*22); Scoping review: *Borges do Nascimento et al.*, (21)
Headache	8 to 12%	SR: *Rodriguez-Morales et al. (*22); Scoping review: *Borges do Nascimento et al.*, (21)
Gastrointestinal symptoms	9%	Scoping review: *Borges do Nascimento et al.,* (21)
Diarrhoea	6 to 7%	SR: *Rodriguez-Morales et al.* (22); *Liu et al.* (4)
Limited evidence		
Anosmia	Common	SR: *Whittaker, A et al.,(24)*; *Liu et al.* (4)
General neurological sequelae	Unclear frequency and severity	SR: *Leonardi, M, et al.*, (23)
Others: seizures, stroke, Guillain-Barré syndrome	Possible (uncommon)	SR: *Whittaker, A et al.,(24)*; *Liu et al.* (4)

Pregnant women		
Fever	68%; main symptom	SR: *Zaigham & Andersson, (15); Muhidin et al. (14)*
Cough	34%; main symptom	SR: *Zaigham & Andersson, (15) ; Muhidin et al. (14)*
Dyspnea	Common	SR: *Juan J, et al. (13)*
Myalgia or fatigue	Common	SR: *Juan J, et al. (13)*
Severe pneumonia	0 to 14%	SR: *Juan J, et al. (13)*

*SR: Systematic Review

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		
Physical distancing - Protective effect	Lower odds for transmission; 82% lower odds with distancing of ≥1m (absolute risk: 13%, vs 3% if <1m). Significantly additional transmission risk reduction for each additional 1m distancing Physical distancing supported by cohort studies	SR and meta-analysis: *Chu et al (32)* SR: *Jefferson et al. (30*)
Coughing, particle spread	Horizontal spread is size-dependent, range (size): 2m (30 µm) to 3m (<10 µm) in experimental studies and mathematical modelling	SR: *Bahl et al.* (31)
Frequent handwashing	Odds nearly ½ lower for SARS, and 80% less for common colds	SR: *Jefferson et al. (30*)
Rubbing antiseptics	Benzalkonium chloride: lower risk for airways infection in kids; Impregnated handkerchiefs may prevent infection	SR: *Jefferson et al. (30*)
Wearing gloves	Odds nearly ½ lower for SARS – maximum effect combined with handwashing, mask and gown (odds: 90% lower) Adversities: 73% of cases (e.g., skin rash and itching)	SR: *Jefferson et al. (30*)
Masks or respirators worn by diseased individuals	May prevent the transmission of influenza to others (including surgical masks, P2 and N95 respirators). Odds may be 67% lower with surgical masks than with none N95 respirators, adversities: 36% of cases (e.g., skin rash and itching)	SR: *Cowling et al. (29); Jefferson et al. (30*)
Masks or respirators worn by healthy individuals	Little evidence supporting a protective effect. Risk is 44% with N95 respirators, surgical masks or reusable 12-16-layer cotton masks. Single-layer masks are less protective.	SR: *Cowling et al. (29)* SR and meta-analysis: *Chu et al (32)*

	Pros: acceptable, feasible and reassuring; cons: discomfort, and potential equity issues (use of resources).	
Face shields/eye protection	67% lower odds for infection	SR and meta-analysis: *Chu et al (32)*
Specific settings, general precautions		
Long-term care settings	Poor infection control (mainly poor hand hygiene and surface disinfection): higher risk to influenza; Disinfection of living quarters reduced odds of SARS by 70%	SR: *Lee et a (32)*; *Jefferson et al. (30*)
Dental laboratories	Frequent non-ideal infection control, i.e.: (i) roughly half of labs are unaware on whether dentists disinfect impressions; (ii) some labs still do not disinfect all impressions received; (iii) non-use of gloves and lack of a standard vaccination policy; (iv) potential barrier: infection control as an additional financial burden	SR: *Vázquez-Rodríguez, et al (34).*
Teledentistry		
Potential use	(i) Pre-implant evaluation, oral cancer surveillance and TMD (ii) Reducing costs of care (iii) Real-time appointments and remote data access (iv) Capacity building (supportive environment/learning), specially for younger or remote clinicians	SR: *Estai et al. (36).* SR: *Irving et al. (37)*
Advantages	(i) Better access to oral healthcare, especially for remote and rural areas, nursing homes (ii) Easier public access to oral health information (iii) Avoidance of inappropriate referrals	SR: *Estai et al. (36); Irving et al. (37)*
Limitations	(i) Human resources: need for dedicated personnel, remuneration of care providers (ii) Challenges with policies/regulations, safety of electronic records	SR: *Irving et al. (37)*

*SR: systematic review.

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)		
Full body PPE	Powered respirator and coverall vs N95: (i) 73% less contamination risk; (ii) 7.5x higher risk for non-compliance (harder to don and doff).	SR: *Verbeek et al (38)*
Gowns	Better protection than aprons. Water-repellent vs breathable material: more protection but less satisfaction). Modifications on gowns seem to reduce contamination risk (i.e., sealed gowns, better fit on neck, wrists and hands, better cover of gown-wrist interface, tabs for easier doffing of masks. Instructions for correct doffing – less contamination.	SR: *Verbeek et al (38)*
Wearing gloves	Double gloving: possibly less viral contamination. Hand-rub before doffing: less contamination with quaternary ammonium or bleach, not with alcohol. Instructions for correct doffing – less contamination.	SR: *Verbeek et al (38)*
Face shields and eye protection	Nurses were at lower odds of influenza if wearing a face shield correctly. Eye protection: 78% lower odds for infection.	SR: *Cowling et al. (29)* SR and meta-analysis: *Chu et al (32)*
N95 vs surgical masks	70% (RR: 0.30) less risk of transmission in healthcare settings, regardless of type (N95 respirators, surgical masks or reusable 12-16-layer cotton masks). Some evidence N95 respirators may have greater protective effect than masks in health care settings. Not clear with aerosols. Drawback: less clear communication and perceived less empathy (professional → care receiver). Similar odds for viral respiratory infections (including influenza) and absenteeism rates (nurses, around 20%). N95 more uncomfortable and irritating to skin.	SR and meta-analysis: *Chu et al (32)* SR: *Bartoszko et al (40); Jefferson et al. (30)*

	No difference for viral infections, but N95 has less colonization than surgical masks (risk: 42% less). N95 recommended for high-risk medical staff.	SR: *Youlin Long, et al., (39)*

*SR – systematic review

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

Approach	Main findings	Source*
Limited evidence		
N95 respirators		
Vaporized hydrogen peroxide	Single cycle: virucidal, some anti-bacterial efficacy, no change in physical properties (airflow resistance, aerosol penetration). More than one cycle: unclear effect.	SR: *O'Hearn et al. (42); Scoping review: Onofre et al.(43)*
Other chemicals	Ethylene oxide: virucidal, no change in physical properties. Bleach, ethanol and isopropanol solutions: not recommended due to physical damage. All tested with single cycle.	SR: *O'Hearn et al. (42)*
Ultraviolet light	Viral load reduction per cumulative dose: (i) 20 kJ/m^2: 99%; (ii) 40 kJ/m^2: 99.9%. Studies tested up to 3 cycles of irradiation. No changes on fit or particle passing rate up to 3 cycles.	SR: *O'Hearn et al. (41)*
	Need for standardization for different materials. Promising combination with other agents (e.g. with peracetic acid, hydrogen peroxide and dry heat).	Scoping review: *Onofre et al.(43)*
Surgical masks		
Decontamination after use	Minimal change in filtration with dry heat, mild with 70% ethanol; damage may be worse with 70% isopropanol; autoclave and 0.5% bleach led to major damage. No data on antiviral/antimicrobial effects	SR: *Zorko et al. (44)*
Treatment before use	Several pre-use experimental coating protocols: mild effect on mask efficacy and adverseness. Unclear effect	SR: *Zorko et al. (44)*

*SR: systematic review.

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		
Water Contamination	Detection of SARS-CoV: (i) In hospital wastewater, domestic sewage, and tap water at 20C persisted for 2 days; In hospital wastewater, domestic sewage, and tap water at 4C, persisted for 14 days (n=4) (ii) SARS-CoV RNA in water environments (approx 63% of samples) (iii) Concentration of SARS-CoV from water: ● Sewage from housing (0 - 1%); ● Sewage from hospital (21.4%)	Scoping Review: *La Rosa et al.* (48)
Limited evidence for SARS, MERS, H1N1, Influenza		
Bio-aerosol transmission/ contamination	Contamination of SARS to Health care workers: ***Key medical interventions:*** (i) Performing Tracheal intubation (5.6x more chance of contamination) (ii) Performing chest compression (4x more chance of contamination) (iii) Performing tracheotomy (3.2x more chance of contamination) (iv) Performing Defibrillation (2.5x more chance of contamination) (v) Performing non-invasive ventilation (2x more chance of contamination) (vi) Performing Manual ventilation (1.8x more chance of contamination) Bacterial contamination: ***Mobile Dental Unit:*** (i) Before treatment (6.5 Units*) (ii) During dental treatment (26.0 Units) (iii) After dental treatment (9.0 Units)	SR: *Tran et al. (47)* Scoping Review: *Zemouri et al. (45)* Cohort Study: *Shivakumar et al. (46)*

*Units for CFU: colony-forming unit (count of viable bacteria); SR: Systematic review.

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		
Oral Rinse Chlorhexidine (CHX)	***In Dental Procedures:*** Before ultrasonic scaling, tempered CHX 0.2% presented the highest probabilities of being ranked the most effective treatment (31.2% bio-aerosol reduction). Before different types of dental treatments, CHX presented a reduction of 78.9% Units. ***In Medical Procedures:*** Before mechanically ventilated patients to reduce risk of pneumonia (28% bio-aerosol reduction). (i) Before elective cardiac surgery to reduce risk of pneumonia (48% bio-aerosol reduction). (ii) Before elective cardiac surgery to reduce risk of nosocomial infections (35% bio-aerosol reduction). Before undergoing ventilation to prevent pneumonia (29% bio-aerosol reduction).	SR: *Koletsi et al.(50)* SR: *Marui et al.(49)* SR: *Labeau et al.(51)* SR: *Spreadborough et al. (53)* SR:*Li et al. (52)*
Herbal rinse	**In dental procedures** Before different types of dental treatments, presented a reduction of 35.9% Units.	SR: *Marui et al.(49)*
Cetil Pyridinium Chloride	**In dental procedures** Before different types of dental treatments, presented a reduction of 61.2% Units.	SR: *Marui et al.(49)*
Essential Oils	**In dental procedures** Before different types of dental treatments, presented a reduction of 43.5% Units.	SR: *Marui et al.(49)*

Povidine-Iodine	***In Medical Procedures:***	
	Before mechanically ventilated patients to reduce risk of pneumonia (61% bio-aerosol reduction).	SR: *Labeau et al.(51)*
	Before undergoing ventilation to prevent pneumonia (61% bio-aerosol reduction).	SR: *Li et al. (52)*

*Units for CFU: colony-forming unit (count of viable bacteria); SR: Systematic review.

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, MERS, H1N1, Influenza		
Ventilation of various buildings	Confirmed SARS cases in: (i) Hospitals ventilation:138 cases (ii) High-rise housing state: 4\19 blocks	SR: *Li et al. (56)*
Hospital ventilation systems	Bio-aerosol concentrations in the different areas of the hospitals: ***Bacterial units*** (i) With natural ventilation: 201 Units vs areas using mechanical ventilation: 20 Units (ii) In inpatient facilities: 77 Units (iii) In public areas: 14 Units (iv) In restrict areas: 13 Units (v) With enhanced mechanical ventilation systems: 9 Units	SR: *Stockwell et al. (55)*

*Units for CFU: colony-forming unit (count of viable bacteria); SR: Systematic review.

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

Setting/Intervention	Main findings	Source*
Limited evidence in relation to SARS, MERS, H1N1, Influenza		
Nosocomial pathogens on inanimate surface	***In a hospital environment:*** Persistence of different virus: (i) Adenovirus: 7 days to 3 months (ii) SARS: 72-96 hours (iii) Influenza virus: 1 -2 days (iv) Coronavirus: 3 hours	SR: *Kramer et al. (57)*
Limited evidence		
Disinfectants	**Chlorine** Viral disinfection on different surfaces: (i) Ceramic : 42% reduction of microorganisms (ii) Plastics: 26% reduction of microorganisms (iii) Stainless Steel: 18.2% reduction of microorganisms (iv) Fabric: 9.2%reduction of microorganisms (v)Glass: 3.65% reduction of microorganisms (vi) Wood: 2.8% reduction of microorganisms	SR: *Gallandat et al. (59)*
	Alcohols Viral disinfection of different surfaces: (i) Glass:14.6%reduction of microorganisms (ii) Plastics:9.35%reduction of microorganisms (iii) Stainless Steel: 8.1%reduction of microorganisms (iv) Fabric:7.4%reduction of microorganisms	SR: *Gallandat et al. (59)*
	Hydrogen Peroxide Viral disinfection of different surfaces: (i) Stainless Steel:3.7% reduction of microorganisms (ii) Glass: 2.4%reduction of microorganisms	SR: *Gallandat et al. (59)*

	Peracetic Acid Viral disinfection of different surfaces: (i) Stainless Steel: 2.6% reduction of microorganisms (ii) Plastics:1.47%reduction of microorganisms	SR: *Gallandat et al. (59)*
	Chlorhexidine Viral disinfection of different surfaces: (i) Plastics: 1.97% reduction of microorganisms (ii) Stainless Steel:0.5% reduction of microorganisms	SR: *Gallandat et al. (59)*
Floor surface and environmental ground	Bacteria, fungi and viruses could be presented on floor surfaces through direct and indirect routes of transmission: (i) Avian Influenza virus: detected 6m downwind from the barn. (ii)Rhinovirus: Higher infection rate in Hospital simulation room - unclear (56% vs 36% cleaned titles). Interventions such as efficient cleaning of floor surfaces and vectors that transfer infectious organisms to floors such as shoe soles could be an effective infection control strategy to prevent human disease.	SR: *Rashid et al. (58)*
Disinfection Wipes	*Microfiber wipes:* ● Superior microbial removal ● Superior efficiency vs cotton string mops *Disinfectant-impregnated wipes:* (i) Alcohol: ● Rapid bactericidal effect (not sporicidal) ● Poor inactivation effectiveness for some virus (ii) Chlorine and Chlorine Compounds: ● Large bactericidal spectrum (iii) Peroxygens: ● Germicidal activity (including bacterial spores) (iv) Quaternary Amonium Compounds: ● Broad spectra of biocidal activity (lipid, enveloped viruses, like COVID-19. ● Less effective with gram negative bacteria and non-enveloped viruses	SR: *Song et al. (60)*

* SR: Systematic review.

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 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 20 years (January 2000 to June 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", "d"+"e", and "f"+"g"), 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.2. Description of studies

J.2.1. Results of the search

The search strategy retrieved 7,877 study titles and abstracts. After examining those references, 7,795 clearly did not meet the inclusion criteria and were excluded. Eighty-two full text reports of potentially relevant studies were obtained for further evaluation. After excluding 23 full reports, our sample totalled 60 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	778	751	27 *(3.5%)*
C	3,174	3.165	8 *(0.3%)*
D + E	751	744	7 *(0.9%)*
F + G	762	752	10 *(1.3%)*
H	453	451	2 *(0.4%)*
I	1,959	1.954	5 *(0.3%)*

* No duplicate found within any of the six searches; **Count followed by percent from total.

J.2.2. Included Studies

Most included studies were published in the last 10 years. Whereas only 5 (8%) reports were published between 2000 and 2010, numbers rise to 15 (26%) between 2011 and 2019, and further to 39 (66%) from January to June 2020. Regarding study design, the majority of our inclusions were SR (n=50, 85%). We have also included seven scoping reviews (12%), as well as two primary studies not listed as references in included SRs: one RCT (1.5%) and one prospective cohort study (1.5%).

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 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 moogievirus* 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 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 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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.
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 areas F and 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

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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. 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 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 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

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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. 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 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.
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