SANTA FE GROUP
Improving Lives Through Oral Health

COVID-19: A Catalyst for Engendering Public Trust in Health Care and Building Back a Better Health Profession Response

Abstract

Trust is critical for informing and influencing the public's response to infectious diseases, pandemics, and disasters. Health care professionals rank exceptionally high in measures of public trust of all professionals, putting these professionals in the position to strongly influence information the public seeks and values, especially at times of great risk or loss. This trust, in the case of COVID-19, influences perception and understanding of the severity and transmissibility of the disease and willingness to adopt interventions. The COVID-19 pandemic has created situations that have the potential to deeply undermine that trust. Alternatively, those same situations can catalyze responses by health professionals to maintain and engender an even greater level of trust and thereby contribute to a coordinated and timely response for the current and coming phases of the pandemic.

This commentary summarizes the challenges during the early evolution of the COVID-19 pandemic in the U.S., explores its consequences, and outlines three calls to action catalyzed by pandemic-created disruptions. In this first of a series, we provide a glimpse of the rapid, complex unfolding landscape from December 2019 through January 2021, drawn from a mixture of sources including global and national agencies, governmental executive orders, professional organizations, media reports, and peer-reviewed publications that are referenced. The Santa Fe Group is eager and poised to learn and collaborate with other organizations to enrich and engender public trust in health care professionals, thereby building back a better and stronger health care response to improve the health of the nation and accelerate recovery from this and future pandemics by:

- Health care professionals, medical and oral health, together and separately, being outspoken, providing and advocating for clear, culturally sensitive, science-based, consistent health information and messaging to inform both policy and public-facing information.
- Fully integrating oral health care professionals and other health care professionals into planning and response to future emergencies and pandemics, by having them contribute to the full scope of their training.
- Oral health care professionals embracing the value of and implementing specific actions to define and drive policies for bi-directionally integrated oral health and primary care.

Framing the Situation/Pandemic-related Events

Coronavirus, SARS-CoV-2, now known as COVID-19, came onto the scene as a new, invisible, unfamiliar threat with unknown incubation period, infectivity, vulnerability of specific population groups, recovery and mortality rates, and treatment regimens (1). Given that little was yet known about COVID-19, in January 2020 the World Health Organization (WHO) declared the novel coronavirus outbreak a public health emergency (2), designating it as a pandemic on March 11 (3). On March 17, the U.S. White House Coronavirus Task Force requested that hospitals, primary care providers and dentists suspend elective procedures, thus eliminating distractions for life-saving activities, freeing up hospital beds and space, and assuring that ventilators were available for COVID patients (4). For oral health professionals, this non-mandatory request was expected to be for only a two-week period to ensure availability of sufficient personal protective equipment. Shortly after the Task Force request, the Centers for Medicare and Medicaid Services (CMS) formally recommended that all "non-essential dental exams and procedures be postponed" (5), and the Centers for Disease Control and Prevention (CDC) recommended "dental facilities postpone elective procedures,

surgeries, and non-urgent dental visits" (6). On March 22, the Surgeon General asked health systems to cancel or delay non-essential elective procedures in a way that minimizes potential harm to patients (7). Professional medical and dental organizations, as well as state-based governing and licensing bodies, soon followed suit (8-10). Suddenly, a two-week moratorium on all but emergency procedures extended into what turned out to be a many months' moratorium.

In parallel, concern focused on protecting the population from the virus. As early as March, older people were encouraged to stay at home as much as possible (11). Soon thereafter, all ages were included in that recommendation (12). On March 15, the CDC recommended that schools close until the infection curve flattened (13). Group gatherings of any type were strongly discouraged. In some cases, local governments cancelled events, limited travel (14), and even decreed that churches suspend services (15). Facemask wearing for the public was first formally recommended in early April, though the CDC had stated precisely the opposite two months prior (16).

Lacking a coordinated national plan with recommendations from Federal agencies, States independently established and implemented their own response plans. Not surprisingly, these plans have been remarkably variable, generating a heterogeneous landscape of policies across the country, reflecting the appetite of the State's leadership for enforcing various CDC-recommended measures while managing ever-growing new COVID infections and deaths (14, 17). At various times, States have closed all bars and restaurants except for takeout and delivery, banned all gatherings, ordered mandatory statewide quarantine, closed all nonessential businesses, closed schools, and restricted both interstate and international travel (18). Similarly, at various times, States, acting independently of each other, have reopened various businesses and relaxed constraints – often to later again reimpose these constraints (19).

By the end of November, over 13 million confirmed cases of COVID-19 and 265,000 deaths had been reported in the U.S. (19). Nationwide, reported cases were escalating exponentially, at the rate of approximately 1000/week in late November (19). By January 12, 2021, the numbers had risen to 23,171,838 cases and 386,269 deaths in the U.S. (20). And in early January 2021, more infectious variants of the virus began being identified (21). Between January 1 and February 1, 2021, another 100,000 people died in the U.S. (22). What was originally projected as a "second wave" of infections and deaths in reality resulted in a continuous national wave, with state-by-state variations in rising numbers of cases and deaths.

Sadly, the numbers of cases and COVID-19-caused deaths may be conservative. Testing centers were and still are overwhelmed in some States (23, 24) and, despite having extensive added capacity, turnaround time for laboratory results is so long it's potentially no longer relevant (25). Availability of tests for the public at large and for health care workers remains inconsistent, while private sector testing investments for national sports demonstrate the ability to have targeted efforts. For instance, the National Football League has administered 43,148 tests to 7,856 players, coaches and employees (26). Major League Soccer administered nearly 5000 tests in a week and Major League Baseball conducted 170,000 tests during its truncated season. Yet a COVID clinic nurse in California was never tested because her employer refused to provide testing for its medical staff even after possible exposure! Nurses in her facility were expected to seek out a testing site on their own, pay for the test if no free testing was available, and take unpaid leave while awaiting test results (26).

Two vaccines (Pfizer BioNTech and Moderna) earned emergency use authorization (EUA) from the FDA on December 11 and December 18 respectively (27, 28). On December 14, the first patient in the U.S., other than those engaged in clinical trials, received the first of two needed doses, followed by the second 21 days later (29, 30). Other vaccines are in development but have yet to be approved and released in the U.S.

The National Academies of Sciences, Engineering, and Medicine (NASEM) developed a framework for equitable allocation of the vaccine (31). In their assessment, the allocation of people in prioritized groups seeks to "reduce severe morbidity and mortality and negative societal impact due to the transmission of SARS-CoV-2." Those delineated as first priority, designated as Phase 1a, for inoculation include health care workers as well as nursing home residents and staff. In parallel, the Advisory Committee on Immunization Practices (ACIP), a non-governmental advisory group of medical and public health experts, developed national recommendations for vaccine use in the U.S. (32). The subsequently issued CDC guidelines effectively mirror these recommendations (33).

As with other policies, States were left to create their own distribution and vaccination plans, creating a variety of arrangements that were not without controversy about both how and the priority of who should get vaccinated (e.g., teachers as schools reopening is considered) (34, 35). Most recently, consideration is being given to vaccinating the maximum number of people with the first dose, without assurance that sufficient numbers of doses for the second injection will be available at the prescribed time determined through clinical testing (36). In mid-January 2021, the government announced that no second doses are (or were) stockpiled (37).

Meanwhile, the numbers of cases and deaths are increasing exponentially. By January 12, 2021, 91,546,296 cases were reported affecting 218 countries and territories around the world and 1,959,008 people had died of the disease; of these, 23,171,838 cases and 386,269 deaths were in the U.S. (38). And the consequences of the pandemic are becoming increasingly more troubling.

Consequences of the COVID-19 Pandemic

Historically, public trust of health care professionals has been extraordinary. In the U.S. in 2018, 92% of the population trusted health care professionals for medical advice (vs. only 59% who trusted the information from the government) (38). It is this trust that is critical for influencing response behaviors to infectious diseases, including severity and transmissibility of disease, willingness to adopt interventions, and information seeking behavior - all of which are critical for containing and managing infectious disease outbreaks (1, 39-44). Unfortunately, the

pandemic has highlighted widespread mistrust for scientific advice in populations in the U.S. and across the world (45). Conflicting and/or inconsistent statements from government leaders, scientists, and health care professions have confused the public and negatively influenced their responses to this infectious disease that has now reached pandemic proportions. In parallel, evolving and conflicting statements from the government, in combination with emerging science related to COVID-19, has also confused health care professionals and their respective associations.

One of the startling consequences of the pandemic was limitations to access of health care for millions of people. Messaging inconsistencies, including those from the most trusted sources, amplified uncertainties. Personal protective equipment scarcities increased concerns about potential exposure and risk of becoming infected. Together, these confused and raised the anxiety of the public.

Loss of Access to Health Care. Global and national declarations that portions of health care services are non-essential led to the closure of the vast majority of dental and primary medical care practices except for emergency care (4-10). The ADA's Health Policy Institute (HPI) found that by March 23, 76% of dental offices had closed except for emergency care and another 19% had closed their offices completely (46). Effectively, the response to these declarations resulted in disrupting ongoing treatment plans and the loss of substantial services, particularly preventive care, for patients. Importantly, medical and dental school-based clinics were also impacted, severely limiting care available to economically vulnerable people who have few alternatives for seeking treatment elsewhere (47). While the intent was to protect the public and make scarce resources available for emergencies, this message and its resulting actions undermined years of research and policies supporting the value of preventive care in overall health (48-51). Effectively, except for emergencies, medical and dental care was withheld from the population for a number of months, undermining the perceived value of primary health care as an essential component of population health.

COVID-driven economic challenges played a critical role in people's ability and willingness to access available care. By April 2020, 90% of the U.S. population (300 million people) were under State- or city-mandated "shelter in place" rules or recommendations (52). Many businesses and schools were either partially or fully shut down. Millions lost their jobs. By April alone, 23 million were unemployed (53). Many of those unemployed or re-employed had lost health and/or dental insurance tied to their jobs (54). Unemployment statistics began improving as business began reopening. By October, 11 million people were unemployed. Unfortunately, then businesses began re-closing and by the beginning of 2021, 19 million people were still without employment (55, 56). Though promising at times, reductions in unemployment do not necessarily translate to restoration of health care benefits. Before the pandemic, 26 million people had some form of dental coverage, 50% of which was covered by their employer (54). In March, approximately 47% of the people unemployed expected to become uninsured (54), likely ultimately leading to an increase in more complex care with associated higher costs (57, 58).

Affordability has been shown to be the main barrier to getting needed dental care (59). Even before COVID-19, in 2013 through 2016, 15% of the U.S. population (48 million people) needed dental care but did not obtain it (59). A 2019 study showed that the three top barriers to seeking dental care before the pandemic were that they could not afford care, insurance did not cover procedures, or they did not want to spend the money on oral health (59). In 2015, dentistry ranked among the top health care services that people were willing to forgo, despite needing care (9.5% forgo dentistry, 5.4% forgo eyeglasses, 5.3% forgo prescription drugs, 5.1% forgo medical care, and 1.5% forgo mental health services) (60). Surprisingly, these barriers were most frequently voiced by seniors as well as both high- and low-income working-age adults. Things got more complicated as the pandemic unfolded. In a more recent survey, 48% of people reported that their family skipped or delayed getting health care due to the pandemic and 11% said that person's condition worsened due to the missed care (61). With COVID-19, increasing financial pressures are forcing people to make difficult choices, often at the expense of seeking treatment, even for emergency conditions (59, 62-65). The Kaiser Family Foundation reports that 1 in 4 of the people surveyed expect a family member to turn to Medicaid for health care but Medicaid dental benefits are severely limited (61) and State budgets are being negatively influenced by loss of business-generated income streams.

In the early winter of 2020, hospitals had become overwhelmed as the numbers of COVID-19 patients skyrocketed (66). Patients were being transferred hundreds of miles for an available bed and hospitals across the country were turning away transfer requests from other hospitals for patients needing urgent care (66, 67). Church gymnasiums, sports field houses, parking lots, and convention centers have been transformed into treatment centers (68, 69). Tragically, despite these expanded facilities, shortages of nurses and doctors are acute as demand continues to increase (70). Hot spots can no longer draw help from cold spots to manage increasing demands on staffing and physical capacity; retired nurses and students are being recruited to help. A January Web search of "shortages of nurses and doctors increase as COVID cases increase" yielded 83.5 million results, indicating how urgent and widespread the problem has become. Paradoxically, as primary care facilities closed, a number of physicians and affiliated health care workers found themselves without jobs (71)! Health care workers in intensive care units are burned out and have themselves become infected (72). Asymptomatic health care employees have been told to continue working (67). As a result, guidelines for prioritizing patient care are continually being revisited and revised (73).

Together, the lack of intensive care units and shortage of staff has left some hospitals trying to deal with long lines of ambulances waiting for patients to be admitted. That, in turn, creates a secondary problem of effectively taking ambulances out of service for "normal" urgencies like accidents, heart attacks, and other acute health problems (74). The extraordinary

strain on resources makes optimal standards of care harder to maintain (67, 75). Equally troubling, in some areas, patients are being triaged with first responders advised to not transport patients if the patient's survival chances are low (76).

Inconsistent Messaging. Inconsistent messaging to the public and health care providers alike cannot help but undermine the public's trust in health care (1, 77). Numerous examples of inconsistency can be cited emanating from a range of previously trusted sources including federal agencies and senior national leadership, as well as media and social networks. It is not surprising that inconsistent messages were delivered. Communication and coordination of messaging is critical when a global disaster includes a novel virus. However, the knowledge base was evolving and messages changed as we learned more. Initial messaging was based primarily on "best guesses" based on what was and is known about similar viruses. Mitigation practices had to rely on past public health practices. Even now, ongoing challenges remain including (1) managing the rapidly evolving science and digesting the science findings in a manner that can be communicated to and understood by the public and health care professionals; (2) the tsunami of information, science-based or not, that is likely to continue to grow; and (3) attempting to coordinate messages among a host of messengers and different media. Nonetheless, the importance – and challenge - of aligning messages provided by health care providers is paramount.

Since the first cases of COVID-19 were identified, multiple instances of inconsistent messaging have been delivered from various sources, ranging from international organizations like the World Health Organization, the U.S. Government, professional organizations, and various media outlets. One inconsistency is whether or not we must wear masks in public, which continues to be an on-going debate despite scientific evidence of their effectiveness (78, 79). Others include whether or not children are vulnerable to the virus despite reports of growing numbers of the young being infected and dying (80); whether or not it is safe for children and young adults to return to schools and universities despite recent reports of school-based hot spots developing (81, 82); and whether various drugs are effective in treating the virus despite clinical studies that fail to prove they have value (82). Inconsistent messages about these day-to-day considerations undermines and erodes public trust.

Messages about non-pharmaceutical interventions (physical distancing, limits on group sizes, mask wearing, etc.) between jurisdictions have been inconsistent. Some jurisdictions granting exceptions were in close proximity to jurisdictions that were not permitting those exceptions. Not only does this add confusion for the public, but models of the effects of parameters suggest that partial measures can often be worse than none at all. For instance, this may be the case when an infected individual travels to a neighborhood with different policies, ultimately creating an epidemic when the outbreak would otherwise have been controlled (83).

Among some of the most troubling inconsistencies resulted from officials interfering with and/or contradicting guidance from the CDC relative to testing and how test results were reported (e.g., if a person tested positive on an antigen test, it is said to have a probable case; but in most states, that situation was not reported as a separate category) (84), use of unapproved and potentially dangerous treatment options (85, 86), and promoting that herd immunity can be obtained without achieving vaccination of 70% of the population estimated to be required to halt the disease (87).

Inconsistent messaging relative to vaccination exacerbated vaccine hesitancy. While the percentages of the public who say they would definitely or probably get a vaccine is growing (71% in December vs. 63% in September), 35% of Black adults say they definitely or probably would not get vaccinated despite being disproportionally affected by the disease (88). Among the main reasons for the hesitancy are worries about possible side effects (59%) followed closely by lack of trust in the government to ensure the vaccines' safety and effectiveness (55%). Unfortunately, those at highest risk for COVID-19 have the greatest hesitancy to get vaccinated. About half of the Black adults surveyed cite a major reason is that they don't trust vaccines in general (47%) or that they may get infected from the vaccine (50%). Both Black and Hispanic people say they don't believe their needs have been taken into account in the development process, emphasizing the importance of clear science-based messaging to these groups (88).

Lacking a unified federal plan for vaccination, States independently developed their own plans for distribution and vaccination. Unfortunately, despite federally promised quantities of vaccines, many States have received less than the anticipated numbers of doses (89). As a result, the State's or local community's ability to deliver was hampered, leaving vulnerable people unable to get coverage. Recently, consideration is being given to vaccinating the maximum number of people with the first dose, without assurance that sufficient numbers of doses for the second injection will be available at the prescribed time determined through clinical testing, and that different vaccines can be interchanged with the second dose not necessarily being from the same manufacturer (90). In mid-January 2021, the government announced that no second doses are (or have been) available (91). It is little wonder that the public is confused, and trust is being undermined.

From a clinician's perspective, perplexing inconsistent messaging also related to when medical and dental practices should reopen to provide more than just emergency care. There was no clarity about the national and/or state gating criteria and/or extent of the pandemic and its progression as the basis for health care practice-specific closing or reopening. Using oral health as an example, it was particularly troubling when conflicting statements were issued by the World Health Organization (WHO) and the ADA in early August. Both WHO and the CDC urged that routine dental visits (oral health checkups, cleanings, and other preventive care) be postponed where there is high community COVID-19 transmission rate (92, 93). The ADA's response was that it "strongly disagrees" with the WHO recommendation, arguing that "dentistry is essential health care because of its role in evaluating, diagnosing, preventing or treating oral diseases, which can affect systemic health" and continued by pointing out that with appropriate PPE patients can be treated safely and dental care should continue to be delivered during global

pandemics and other disaster situations (94).

As a new, previously unknown virus, it is not surprising that COVID-19 consequences are complicated and unsettling. Unfortunately, the inconsistency of messages between and within States, regions, cities, and individual communities creates a "fog of the pandemic" (84) and undermines the public's trust in the information they are receiving. Further challenges result from inconsistencies between global trusted entities like WHO and nationally trusted professional entities. Yet it is this very information and direction that the public and public health professionals need to make decisions, many of which are literally life and death decisions.

Scarcity of Protective Equipment. Shortages of personal protective equipment (PPE) quickly became obvious. In early March, WHO raised the alarm that PPE shortages in gloves, medical masks, respirators, goggles, face shields, and gowns were leaving frontline health care workers dangerously ill-equipped to care for COVID-19 patients (95). In some cases, hospital-based providers were reported to be wearing trash bags because no gowns were available (96). Few would argue that the need and demand for PPE is greatest for those who are treating COVID-19 infected patients. Early in the pandemic in the U.S., dentists even donated their own practice's PPE to help mitigate hospital shortages (97).

The mask shortage carried over to the public who, after initial misguidance, were ultimately strongly encouraged to wear masks whenever they leave their homes or are in contact with vulnerable groups, such as those in nursing homes and medically compromised family members. Members of the public began producing masks and face shields in many ways; school children began 3D printing face shields, and clothing designers and home-based seamstresses began producing face masks, though these are unlikely to deliver the filtration quality of recommended N95 masks (98). The government scrambled to replenish supplies; industry retooled to produce new products (99).

Unfortunately, though improved, shortages of PPE have continued despite remarkable ingenuity on the part of industry and the public (100). Even at the end of July as dental practices began to reopen, only 75% of practices polled by the ADA's Health Policy Institute (HPI) had more than two weeks supply of masks, face shields, and gowns, and 40% reported it was still difficult or very difficult to obtain these supplies (101). In early November, dental practices continued to report no reserves of masks and gowns (102). Supply chains of both PPE and of raw materials to produce them still remain limited and/or vulnerable (103). Further complicating access to PPE is the inability of the strategic national stockpile to meet demand (104). Shortages result from a confluence of challenges including – but certainly not limited to - speed at which demand increased, lag time in expanding and/or converting production facilities, lack of raw materials, and trade arrangements between countries, as well as more and more masks and gloves being used by people that are not part of the health care system, panic buying, hoarding, and misuse (104-106). Unquestionably, this scarcity raises concerns about the possibility of infections when seeking treatment.

Risk of Infection. Reopening dental and primary care medical offices raised concerns for both patients and health care professionals about the potential of exposure to the virus (47). During a dental visit, both risk exposure due to face-to-face proximity and procedures with inevitable exposure to saliva, blood and other body fluids. Other potential risks are associated with procedures that produce aerosols and are related to waste management and/or air circulation. These risk potentials are not new. Face masks were introduced over 100 years ago (107). The global HIV/AIDS pandemic prompted establishment of recommendations and protocols to protect both patients and health care workers by the CDC, the Occupational Safety and Health Administration (OSHA), the ADA, and a host of medical professional organizations. The original recommendations have now been updated and additional protections delineated (108-111), making an already safe environment even safer.

Some dental procedures that generate aerosols are particularly troubling relative to potential bilateral risk of infection from this new virus. Fortunately, that risk is extremely low. Between 1998 and 2015, only three reported incidents of transmission of known pathogens in dental settings and lapses in infection control could be found in CDC's data (112). While little data is yet available about cross infections from COVID-19, one ADA-sponsored study of practicing dentists reports a 0.9% positivity rate for dental staff, suggesting that current infection control protocols seem to be sufficient to prevent infection in dental settings (113). A second study of 2800 patients over six months (March – September 2020) found no transmission to health care workers or patients, even with 69% of the patients having one or more high-risk comorbidities for COVID-19 (114).

Now, COVID-19, known to have airborne transmission as the primary form of spread, has prompted additional safeguards. In both dental and medical settings, before each appointment, patients are asked questions relating to their current symptoms, recent travel and exposure to others with COVID-19. Fewer patients will be in a dental/medical office at any given time, and new infection-control protocols, protective equipment, and airflow conditions are being employed (115, 116). In parallel, dental procedures have changed to minimize creation of aerosols. More cleanings are done by hand scaling rather than using ultrasonic systems (101). Minimally invasive dental procedures such as glass ionomers, silver diamine fluoride, and fluoride varnishes are replacing more invasive procedures that require high speed drilling for cavity preparation (101).

Providers need to continue diligently following the protocols – and they need to inform and assure patients and the public in general that these new protocols are designed to minimize the risk of infection, helping to reassure them of the safety in health care. These changes will likely go a long way toward mitigating both patient and provider concerns but, at least in the short term, will remain as constant reminders of the pandemic.

Deteriorating Health of the Nation and Impact of Delaying Health Care. Systemic health and quality of life can be influenced by oral health (117). Delays in seeking medical and/or dental care have long been known to increase long-term personal and financial costs to the patient, health care, and to

society in general (118, 119). Personal costs can be calculated not only in cost of treatment, but in terms of eating, speaking, and learning problems, as well as the negative influence on social interaction and employment potential (119). Health care costs increase with increased use of emergency room care and more complex and therefore often more costly treatments that could have been prevented and/or may not resolve underlying conditions (120). Costs to society can be measured in annual losses of $45 million worth of productivity lost due to untreated dental disease as well as 34 million school hours lost due to unplanned/emergency dental care (119).

Mental health is yet another of the casualties of the pandemic. People across an array of industries report being emotionally exhausted; 42% reported their overall mental health declined (121), which was particularly troubling in already vulnerable populations (122). By mid-spring 2020, prevalence of anxiety disorders and depressive disorders were three times higher than in the previous year, reflecting COVID-19-related conditions resulting in loneliness, economic strain, reduced physical activity, and increased interpersonal conflict (123). Not surprisingly, alcohol use and the number of people seriously considering suicide also increased (124). The full measure of the impact of the policy decision to postpone non-essential services will likely not be fully understood until the pandemic subsides. Yet accurate understanding of the extent of anxiety and depression are needed to guide our return to normal (123).

Untreated conditions or loss of management of chronic disease often results in worsening conditions. Dentistry offers some useful examples. Untreated infections in the oral cavity, like caries and periodontal disease, will progress if oral health care is not available. As they progress, the conditions may change from ones that can be treated by a simple minimally invasive procedure to more complex, irreversible conditions. For instance, if untreated, caries may invade the dental pulp requiring the need for both endodontic treatment and a subsequent restorative procedure. If a patient is unemployed and has no insurance, he/she may elect to have the tooth extracted, a less costly procedure in the short term but one that could negatively impact their overall health and quality of life in the longer term and, potentially, even their future employment possibilities. Children with malocclusions that could be treated through intervention in growth patterns could face riskier and more costly surgical procedures to achieve the desired results. Importantly, untreated oral infections are associated with an array of systemic diseases including diabetes, obesity, cardiovascular disease, pneumonia, and adverse pregnancy outcomes (125-127). Unfortunately, many of these have been shown to be COVID-19 co-morbidities (128-131).

Recently, suspicions are growing about the connection between high bacterial load in the mouth and post-viral COVID-19 complications (132, 133). It is common for respiratory viruses to predispose patients to bacterial superinfections, as seen in the 1918 and 2009 influenza outbreaks (133). Oral microflora can easily be aspirated into the lungs; periodontal disease-associated enzymes can modify the oral cavity mucosal surfaces, allowing adhesion and colonization of respiratory pathogens as well as destroying the salivary pellicles on bacteria, which hinders clearance from mucosal surfaces; and periodontal-associated cytokines can alter respiratory epithelium, promoting infection by respiratory pathogens (134, 135). Bacterial superinfections have been found in 50% of COVID-19 deaths (136). Over 80% of patients in intensive care units exhibited an exceptionally high bacterial load (137). Together, these findings suggest that oral hygiene is an increasingly important component of COVID-19 recovery, particularly in patients with diabetes, hypertension and cardiovascular disease (133).

What Must We Do to Engender the Public's Trust in Health Care?

Ominously, COVID-19 and its consequences have confused and troubled individuals, the nation, and the world. Health care professionals are in the enviable position of being able to communicate science-based evidence relative to this and future pandemics, as well as contributing to disaster planning and response and safely delivering health care in general. They are among the most trusted in the world. An in-depth analysis by the Wellcome Trust found that 92% of the people in the U.S. trust advice from health care professionals and only 59% trust that information from the government (38). The same analysis found that only 47% of the people in the U.S. have a lot or some trust in their government, one of the lowest in the world!

Public trust is critical for influencing response behaviors to infectious diseases, including perception and understanding of the severity and transmissibility of infectious disease, willingness to adopt interventions, and information the public seeks and values. While the COVID-19 pandemic has confused and troubled the public and health care professionals alike, it is the responsibility of health care professionals to lead initiatives to restore and engender trust in science, health care, and public health, thereby improving the likelihood of accelerating recovery from this and future pandemics.

Three specific actions are needed to maintain and engender the public's trust in health care professionals:

CALL TO ACTION 1: *Health care professionals, medical and oral health, together and separately, must be outspoken and advocate for clear, culturally sensitive, science-based, consistent health information and messaging to inform both policy and public-facing information.*

The public and policy makers need disease-specific, culturally sensitive, science-based knowledge to assess information on COVID-19 (138) and use that information to reinforce appropriate or change inappropriate decisions and behaviors. Without question, the COVID-19 pandemic has highlighted widespread mistrust for scientific advice in populations across the world (45). Scientific institutions were sidelined as key political decisions were made without or despite the evidence (45). The pandemic has resulted in millions unemployed, no longer able to afford health care, housing, or food. It has deteriorated the health of the nation. Inconsistent messaging has confused people. Past skepticism about vaccine safety and reported rare allergic reactions to some vaccines is likely to carry over to coronavirus vaccines, leaving the nation vulnerable to

continuing disease and rising death (139-142).

The ability to make sound scientific decisions is further frustrated by the torrent of science-based information. In 2020, nearly 200,000 articles were posted on-line before peer review, 4% of the world's research output was devoted to coronavirus, and Elsevier's journal February through May publications were up 58% compared with the previous year (143). Few in the public are likely to sort through this massive amount of information.

Strategies are needed to guarantee easy access and better dissemination of high-quality information and facts that have been synthesized into manageable size – for both health care professionals and the public.

The Santa Fe Group is poised to be an integral member of a coalition of health care professionals to create a manageable summary of emerging COVID-19 and related health care literature and articulate best ways to make that information available to their professional peers and policy makers as well as distilling health literacy products for clinicians to share with their patients.

CALL TO ACTION 2: *Oral and other health care professionals must be fully integrated into planning and response to future emergencies and pandemics, by having them contribute the full scope of their training.*

Integrating oral health professionals into the emergency and pandemic response plans would add a well-trusted, knowledgeable, skilled human resource, which could facilitate timely and effective response to future pandemics and emergencies. Having them, along with their medical counterparts, in a fully integrated role in local, state, national, and tribal public health infrastructure would add to the public's trust.

During a pandemic or emergency, the traditional in-place medical workforce is often overwhelmed. COVID-19 was no exception. The original intent of recommending much of "routine" care should be delayed during the pandemic was to free up the health care workforce to care for patients in most need. Unfortunately, many highly capable and experienced health care human resources have been overlooked and underutilized. Dentists, like physicians and other clinicians, understand drugs and their dosages, practice barrier techniques and infection control, are trained in CPR, can take x-rays, and can manage certain types of trauma, suture wounds, give injections, perform screening tests, and calm the worried well (144-147). In addition to the knowledge and skill of dentists and primary care providers in day-to-day care, they could serve as an early warning system for disease outbreaks and track community health (148). Both have effectively participated in medical response teams in a host of man-made and natural disasters (149-151). Yet, during the COVID-19 pandemic, both were overlooked. Primary care providers overwhelmingly reported themselves least valued not only by patients but by government agencies, insurers, hospitals, and health systems (152). Dentists, dental therapists, and hygienists, at best providing only emergency oral health care, petitioned their states to consider using licensed dental professionals to support hospital physicians and nurses. Despite 9000 signatures in one state in late March 2020, these experienced and licensed professionals were not permitted to help reduce the strain of the medical system (153).

It is perplexing to read that pharmacists, firefighters, and EMTs have been tapped to vaccinate the public (154, 155). Dentists, dental therapists, and dental hygienists have been overlooked, despite the fact that they are very well practiced in delivering injections for anesthesia, though in December 2020 they were acknowledged in the CDC's list of health care professionals (156). By November 2020, only a few States allowed dental professionals to administer COVID-19 vaccines to the public, some are actively working to permit this in the near future, and some don't expect it to ever be possible (157). In those States where it is not possible for oral health professionals to administer vaccines, emergency situations could make it possible but governing boards would require an executive order from the State's Governor (158). However, the ADA has recently passed a resolution supporting expansion of the scope of practice, allowing dentists to administer vaccines (159, 160).

It is acknowledged that some vaccines require handling that is not available in their practice physical facilities, and oral health professionals have been shown to be effective contributors outside of their practice in providing aid in emergencies and pandemics (151, 161-164). Importantly, since oral health professionals see many otherwise well patients, they can be an important adjunct in community health surveillance efforts (164).

Oral health professionals are often personally active in their communities, making them a convenient resource for casual health information. As such, they can contribute to early diffusion of concerns and provide culturally sensitive science-based information about the extent and implications of a pandemic or natural or man-made emergency.

The Santa Fe Group is poised to be an integral member of a coalition of health care professionals to collaborate with emergency response planners and medical reserve organizations to determine obstacles for engaging oral health professionals and identifying mechanisms to eliminate the obstacles and fully engage oral health professionals.

CALL TO ACTION 3: *Oral health professionals must embrace the value of and implement specific actions to define and drive policies for bi-directionally integrated oral health and primary care.*

Oral and systemic health are intimately intertwined. Oral diseases share common risk factors, including tobacco, alcohol, diet and stress, with other major noncommunicable disease such as cardiovascular disease and diabetes (165) and are linked with over 50 systemic diseases (166). High oral bacterial loads have been associated with post-viral COVID-19 complications (132, 133). Failing to include oral health risks has been shown to undermine systemic health outcomes and exacerbate health disparities (165).

Approximately one half of U.S. population has at least 1 of 10 common chronic conditions, including hypertension, cancer diagnosis, heart disease, and diabetes (167). By 2033, the American Association of Medical Colleges estimates that there will be a shortage that could be as high as 55,200 primary care physicians in the U.S. (168). This is the result of the confluence of an aging population driving demand for primary care until 2033, the number of physicians nearing traditional retirement age, and increased demand for care by historically underserved

populations facing fewer access barriers. In contrast, HRSA projects that by 2030 the demand for full-time dentists will match the anticipated supply (169), though equitable distribution of dentists/dental care to underserved areas is likely to remain a challenge (170). Changes in delivery of care, incorporating rising numbers of dental therapists, nurse practitioners, and physician's assistants, makes it difficult to accurately predict workforce shortages.

However, each year, over 30 million Americans see a dentist but not a physician, including 700,000 children under 4 years of age. Dentists and hygienists assert that screening for medical conditions is clinically relevant to the practice of both medicine and dentistry (171, 172). Dental practices are equipped to monitor many patient conditions and could provide screening, diagnosis, and follow-up services for at least some common chronic ailments. In 2020, the ADA passed a resolution to promote dentists providing point-of-care screening tests for a variety of health conditions, currently described as medical conditions (159). It has been estimated that if oral health professionals screened patients for diabetes, hypertension, and hypercholesterolemia, the health care system could save between $5.1 and $65.3 million annually (167).

In parallel, it is clear that whole-body care is important. While dental offices are able to screen for, diagnose, and monitor patient conditions, it is equally critical that primary care practices reinforce the importance of oral hygiene and other oral health promotion activities. Oral health should be an integral part of primary care workflow, standards of care, and documentation (173).

Policies that facilitate bi-directionally integrated oral and primary health care could be advantageous to patients, health care providers, and the health care economy.

The Santa Fe Group is poised to be an integral member of a coalition to catalyze discussions and create an action plan with a coalition of health care providers, including the DentalQuest-led Oral Pandemic Response Group, the Covid-19 Public-Private Partner Dental Coordination Group, interprofessional education and practice collaboratives, and others, with the ultimate goal of influencing and driving policies to improve the integration of oral and primary care.

These three proposed critical actions involve consideration and action on the part of providers in collaboration with policy individuals and groups. The real challenge, however, is to not only consider and propose actionable items, but to put outcomes and indicators of the actions in place, further engendering public trust, building back a better health profession response, and improving the health of the nation during normal, emergency, and pandemic conditions.

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- **Raul Garcia, DMD, MMedSi,** Professor and Chair, Department of Health Policy and Health Services Research at Boston University Henry M. Godman School of Dental Medicine
- **Judith Haber, PhD, APRN, BC, FAAN,** Ursula Springer Leadership Professor in Nursing, New York University
- **Ronald Inge, DDS**, Chief Dental Officer/VP of Professional Services for Delta Dental Plan Missouri
- **Judith Jones,** Associate Dean for Academic Administration at the University of Detroit Mercy Corktown Campus School of Dentistry
- **Steven William Kess, MBA,** Vice President, Global Professional Relations for Henry Schein, Inc.
- **Dushanka Kleinman, DDS, MScD,** Associate Dean for Research and Professor in the Department of Epidemiology and Biostatistics, School of Public Health, University of Maryland College Park
- **Ira B. Lamster, DDS, MMSc,** Dean Emeritus and Professor of Dental Medicine at Columbia University College of Dental Medicine
- **Nicholas G. Mosca, DDS, DrPH,** Quality Manager for CrescentCare, a Federally-Qualified Health Center in New Orleans, Louisiana
- **Wendy Mouradian, MD, MS,** Professor Emerita at the University of Washington (UW) School of Dentistry and Founding Director of the UW Regional Initiative in Dental Education program
- **Nader A. Nadershahi, DDS, MBA, EdD,** Dean of University of the Pacific's Arthur A. Dugoni School of Dentistry
- **Linda Niessen, DMD, MPH, MPP,** Founding Dean, Kansas City University College of Dental Medicine (to open fall 2022). Formerly Dean and Professor at NOVA Southeastern University College of Dental Medicine in Fort Lauderdale, FL
- **Fotinos S. Panagakos, DMD, PhD,** Interim Dean, West Virginia University School of Dentistry
- **Gary W. Price,** Principal, Hooks Ridge Consulting

Emeritus Members:

- **Claude Earl Fox, MD, MPH**, President, Med Plus Disability Evaluations Inc. and Professor Emeritus, Miller School of Medicine at University of Miami
- **Terry Fulmer, PhD, RN,** President of The John A. Hartford Foundation in New York City
- **Harold Slavkin, DDS,** Founding Member of the Santa Fe Group, and Dean Emeritus and Professor at the Herman Ostrow School of Dentistry, University of Southern California

Senior Scholars:

- **E. Dianne Rekow**, MSME, MBA, DDS, PhD, Former Dean and Professor Emerita of King's College London Dental Institute
- **Timothy L. Ricks, DMD, MPH, FICD,** 20th Chief Dental Officer of the U.S. Public Health Service and Assistant Surgeon General

Founders Fellows:

- **Patricia A Braun, MD, MPH,** Professor of Pediatrics, Family Medicine, Public Health and Dental Medicine at the University of Colorado
- **Elisa Chavez, DDS,** Associate Professor at the University of the Pacific, Arthur A. Dugoni School of Dentistry
- **Astha Singhal, DMD, PhD,** Assistant Professor in Health Policy and Health Services Research at Boston University School of Dental Medicine

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