Recommendations for Environmental Control of COVID-19 in Ohio

Jim Hartman, R. S., M. S. (Retired)

The focus here is on aspects under the control of local health departments. Meat plants, nursing homes and prisons, all driving the spread of COVID-19 in rural areas (Niemeyer, 2020), are regulated by other agencies.

INTRODUCTION

By now everyone in Ohio is aware that we are in a pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease features asymptomatic spread by respiratory droplets and causes an ever-expanding range of clinical manifestations (Table 1). Ohio Governor Mike DeWine declared a state of emergency on March 09, 2020, when testing by the Department of Health confirmed that the first three suspected cases of COVID-19 in the state were positive (Ohio Department of Health, 2020).

There is evidence that these actions and similar ones around the world prevented millions of infections and deaths (Hernandez, 2019).

CONSPIRACY THEORIES

It is important to acknowledge that many people believe the pandemic is a hoax. An article in the Huffington Post is one of many discussions of “what makes COVID-19 pandemic myths so easy to trust and who is more likely to believe them” (Ries, 2020). “Recently, a study indicated that nearly one third of Americans believe in a conspiracy theory about the coronavirus, such as one that claims the outbreak is linked to 5G internet” (Grohol, 2020). Another popular but baseless theory is that doctors and hospitals are exaggerating deaths due to COVID-19 for profit (Fichera, 2020). This obviously has
grave implications for control.

“REOPENING GUIDE” FOR RESTAURANTS AND BARS

On March 15, 2020, Amy Acton, M.D., MPH, the Director of Health, issued an order closing restaurants and bars except for carry-out and delivery. On May 14 she signed the Director’s Dine Safe Ohio Order that reopened restaurants and bars to dine-in service (with exceptions) and amended it on June 5 (Ohio Department of Health, 2020). The Ohio Restaurant Association and the Ohio Environmental Health Association collaborated on the guidance on which this was based, at the request of Lieutenant Governor Jon Husted (Zummo, 2020).

There was great pressure on the Governor to allow bars and restaurants to open as quickly as possible. On April 13, 2020, as he was giving a televised press briefing in the Statehouse, about 100 protestors outside were shouting at reporters inside; a picture of some of them shouting through the windows went viral (Figure 1) (Staver, 2020).

Illness reporting. The "Responsible RestartOhio" reopening guide for restaurants and bars (https://coronavirus.ohio.gov/static/responsible/Restaurants-and-Bars.pdf) says to “add COVID-19 symptoms to the current standard Health Agreement required by the food safety code.” That seems to be a reference to the Ohio Uniform Food Safety Code section on Employee Health, OAC 3717-1-02.1, which relates to diseases transmissible through food. (Figure 2). The Food Code specifies three different actions to be taken:

1. The Person in Charge (PIC) must report certain diagnoses, listed in (A)(2), to the Health Department;
2. The PIC must keep “conditional employees,” to whom a job has been offered, from working if they have symptoms listed in (A)(1) or diagnoses, listed in (A)(2) or (A)(3), until cleared to work as provided in (E);
3. The PIC must keep “conditional employees,” to whom a job has been offered in an establishment serving a “highly susceptible population,” from working if they have exposures, listed in (A)(4) or (A)(5), until cleared to work as provided in (E).

It is not clear from the guidance where “COVID-19 symptoms” would be added to this; nor is it clear where positive tests or suspected
exposures would fit in. Perhaps this belongs under (A)(5)(c) except not restricted to highly susceptible populations.

The guide for restaurants and bars says to “contact the local health district about suspected cases or exposures;” but this is under the heading “confirmed cases.” It says to “work with [the] local health department to identify potentially infected or exposed individuals” for contact tracing; and, “once testing is readily available, test all suspected infections or exposures.” Potential problems with this include lack of guidance for the local health departments and asymptomatic spread by people living in the same household as symptomatic people. Also, due to the prodromal period, testing can miss cases.

Cleaning and Sanitizing. Because early reports indicated the virus was stable on surfaces, rules addressed cleaning fomites (National Institutes of Health, 2020). The official ODH guidance at https://coronavirus.ohio.gov/static/responsible/Restaurants-and-Bars.pdf isn’t perfectly clear about what is required for cleaning door handles, touch screens, etc. (“Clean all high touch areas every two hours....”) The Food Service Rules (3.2M) call for keeping wiping cloths for “counters and other equipment” in a sanitizer. Perhaps we should recommend using a detergent-sanitizer, which is required for cleaning in place (4.5J). Ohio rules used to go into detail about these products, and Alabama still has guidance posted about them. See https://www.adph.org/environmental/assets/CleanAndSanitize.pdf. (p.5; accessed October 6, 2020). As they say, the label must:
1. Include an EPA registration number.
2. State that the product may be used on food contact surfaces.
3. Not require a potable water rinse.
4. State that the product will sanitize.

The guide for restaurants and bars says to “consider air filtration improvements within [the] HVAC system.” However, the guide for pools says to “increase the frequency of air filter replacement.
and HVAC cleaning” (Ohio Department of Health, 2020), which seems better. Perhaps at some point an easy-to-measure proxy for ventilation can be developed and tested. Carbon dioxide has been suggested for this purpose in schools (Chatzidiakou, 2015) (but not specifically to control viruses). Perhaps the guidance should stress related issues, like contact time and use of test kits.

Ohio Revised Code 3717.02 and the following sections set up a Retail Food Safety Advisory Council to recommend changes to the Food Code. This Council should be convened to deliberate necessary changes. Better yet, the Conference for Food Protection could consider changes to the FDA model Food Code when it reconvenes in April 2021. This could result in uniform rules for the whole country at a time when more is known about the behavior of COVID-19.

“REOPENING GUIDE” FOR SCHOOLS (COVID-19 Health and Prevention Guidance for Ohio K-12 Schools)

The Ohio Department of Health has provided guidance for schools (https://coronavirus.ohio.gov/static/responsible/schools/K-12-Schools-Guidance.pdf). The guidance includes
- Assessing symptoms
- Increased sanitation
- Social distancing
- Face coverings
- Risk assessment and mitigation

The guidance also includes excellent graphics and numerous references to articles in scientific journals, e.g., The Lancet.

For many years local health departments have been inspecting schools under the authority of the Ohio Revised Code:

<table>
<thead>
<tr>
<th>ORC 3707.26 Board shall inspect schools and may close them.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semiannually, and more often, if in its judgment necessary,</td>
</tr>
<tr>
<td>the board of health of a city or general health district</td>
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<tr>
<td>shall inspect the sanitary condition of all schools and</td>
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<td>school buildings within its jurisdiction and may disinfect</td>
</tr>
<tr>
<td>any school building. During an epidemic or threatened</td>
</tr>
<tr>
<td>epidemic, or when a dangerous communicable disease is</td>
</tr>
<tr>
<td>unusually prevalent, the board may close any school and</td>
</tr>
<tr>
<td>prohibit public gatherings for such time as is necessary.</td>
</tr>
</tbody>
</table>

CONTACT TRACING

As the pandemic got going, contact tracing has been geared toward interrupting ongoing transmission to reduce the spread (Anonymous, 2020). The Centers for Disease Control (CDC) initially put up a form for this purpose that seemed to be geared toward ascertainment of the characteristics of this new disease (Centers for Disease Control, 2020).

Columbus Public Health has been using a 6-page form that captures symptoms but also school or child care attendance, residence at a long-term care facility, travel to large events, and use of public transportation (Columbus Public Health, 2020). Contact tracing could go beyond this to identify COVID-19 risks in various venues. The most obvious way to do this would be as an add-on to the existing protocol, by adding pages to interview forms. As of July 19, however, “Due to the current volume of cases, little time is being spent on determining how/where someone was exposed, so that more time can be spent protecting future cases by educating contacts” (Cowen, 2020).

Smart phone technology offers a way to bypass this problem. An article in Science described research already being done using the technology and partnering with existing health studies to research COVID-19 symptoms (Drew, 2020). Meanwhile, Apple and Google are working on technology to notify individuals of exposure to other individuals via their smart phones: https://techcrunch.com/2020/09/01/apple-launches-system-level-covid-19-exposure-notification-express-with-ios-13-7-google-to-follow-later-this-month/.

Smart phone technology could be adapted to alert local health departments to licensed facilities associated with virus spread. Several strategies for detecting foodborne illness have used the global positioning system (GPS) data of smart phone users who had their phones set to share their location data (for navigation purposes, for example) to detect users’ restaurant visits by combining the location data with official health department restaurant licensing records and Google Maps, Google Places API, etc. (Hartman, 2020).
One such strategy, FINDER (Foodborne Illness Detector in Real Time), started as a project developed by Google and the Harvard T. H. Chan School of Public Health (Sadilek, 2018). Individuals did not have to do anything at a restaurant except have their smart phones set to share their location data, as already described. In this case, however, users remained anonymous, but the entire sequence of locations each one visited during the 3 days prior to the user performing a Google search of web pages about foodborne illness were included. To do COVID-19 surveillance like this, all that would be necessary would be to know that the individual with the phone subsequently tested positive.

**COVID-19 INSPECTION REPORTS**

There does not seem to be any uniform inspection report template in use in the United States, Ohio, or any local health department, for COVID-19. Delaware County made their own for bars and restaurants (Figure 3). Inspection reports for bars and restaurants, schools, and any other facility for which “Reopening Guides” have been issued (gyms, etc.), should include all the factors required in the respective "Responsible RestartOhio" document. All these inspections should be public records and should be searchable. Columbus, for example, routinely posts food safety inspections (http://www.decadeonline.com/main.phtml?agency=COL#search) but, apparently, not COVID-19 complaint inspections.

**VIRUS RISK STUDIES**

The goal of designing inspection reports should be to include enough information (like violation details) that the program has predictive power. This is analogous to foodborne illness outbreak investigations. The idea is to try to control the virus by collecting data like we do foodborne illness outbreaks. Ohio is nowhere close to this now.

Years ago a project in Columbus, Ohio, proposed using Classification and Regression Trees (CART) software with food safety inspection data provided by the City to develop new predictive models for adverse outcomes in food inspections (Hartman, 2020). This project was one of a kind, but advances in data processing technology have most likely made it easy to improve on today.

A rudimentary example: participants in a case-control study published in the MMWR showed that people who had patronized a bar or restaurant at which customers failed to wear masks or maintain social distancing were more likely to test positive for COVID-19 after their likely incubation period (Fisher, Kiva, et al., 2020). If in the future mask-wearing and social distancing become ubiquitous, other factors contributing to COVID-19 outbreaks may emerge.

**ENDGAME**

Several possibilities have been envisioned for how this will all play out. The one most often put forward is for a vaccine to be developed, but there are other possibilities.

**Masks and physical distancing.** Some parts of the world, notably Hong Kong and South Korea, have used simple, well-known methods to greatly reduce the epidemic. A systematic review of 172 studies from 16 countries across six continents published in The Lancet in June 2020 (Chu, 2020) showed the efficacy of these measures.

**Vaccine.** The United States government’s “Operation Warp Speed” had five clinical trials for vaccines running as of Halloween 2020, but they have not proceeded as quickly as hoped (Branswell, 2020). There are other problems. According to the New York Times, “a 33-year-old man was infected a second time with the coronavirus more than four months after his
first bout, the first documented case of so-called reinfection,” according to researchers in Hong Kong (Mandavilli, First Documented Coronavirus Reinfection Reported in Hong Kong, 2020). There is also the problem that many people may refuse to take a vaccine even if it’s free (O'keefe, 2020).

**Herd immunity.** Some experts believe eventually enough people will become immune that the virus will die out on its own. The fact that New York City and environs did not immediately experience a resurgence after initially controlling the virus has been cited as evidence for this (Mandavilli, 2020). But a letter in The Lancet (Alwan, 2020), signed by more than 80 experts, called herd immunity a “dangerous fallacy unsupported by scientific evidence.”

**Monoclonal antibodies.** As of August 10, 2020, two Phase 3 randomized placebo-controlled, double-blind clinical trials of experimental monoclonal antibodies to prevent COVID-19 were underway (Anonymous, 2020). One of these trials of whether laboratory-made antibodies can prevent infection or lessen symptoms is underway in Dublin, Ohio (Filby, 2020).

“Unless a vaccine is administered to all of the world’s eight billion inhabitants who are not currently sick or recovered, COVID-19 is likely to become endemic. It will circulate and make people sick seasonally—sometimes very sick. ... The coronavirus, like most viruses, will live on—but not as a planetary plague (Denworth, 2020).”
Table 1. Clinical manifestations of COVID-19 (examples)

<table>
<thead>
<tr>
<th>Fever</th>
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<tbody>
<tr>
<td>Dry cough</td>
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<tr>
<td>Loss of smell or taste</td>
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<tr>
<td>Anorexia</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Gastrointestinal symptoms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea</td>
</tr>
<tr>
<td>Diarrhea</td>
</tr>
</tbody>
</table>

Figure 1. Protests

April 13, 2020; Columbus, OH, USA; Protesters stand outside the Statehouse Atrium, where reporters listen during the State of Ohio’s Coronavirus response update on Monday, April 13, 2020 at the Ohio Statehouse in Columbus, Ohio. About 100 protesters assembled outside the building during Gov. Mike DeWine’s weekday update on the state’s response to the COVID-19 pandemic, upset that the state remains under a Stay-At-Home order and that non-essential businesses remain closed.

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Figure 2. Excerpts from Ohio Uniform Food Safety Code

3717-1-02.1 Management and personnel: employee health.

(a) The licensee shall require food employees and conditional employees to report to the person in charge information about their health as it relates to diseases that are transmissible through food. A food employee or conditional employee shall report the information in a manner that allows the person in charge to reduce the risk of foodborne disease transmission, including providing necessary additional information, such as the date of onset of symptoms and an illness, or of a diagnosis without symptoms, if the food employee or conditional employee:

1. Has any of the following symptoms:
   (a) Vomiting;
   (b) Diarrhea;
   (c) Jaundice;
   (d) Sore throat with fever; or
   (e) A lesion containing pus such as a boil or infected wound that is open or draining and is
   (i) On the hands or wrists, unless an impermeable cover such as a finger cot or a single use glove is worn over the impermeable cover;
   (ii) On exposed portions of the arms, unless the lesion is protected by an impermeable cover; or
   (iii) On other parts of the body, unless the lesion is covered by a dry, durable, tight-fitting bandage;

2. Has an illness diagnosed by a health care provider due to:
   (a) Campylobacter;
   (b) Cryptosporidium;
   (c) Cyclospora;
   (d) Yersinia enterocolitica;
   (e) Staphylococcus aureus;
   (f) Listeria;
   (g) Salmonella spp.;
   (h) Shigella spp.;
   (i) Vibrio cholerae; or
   (j) Yersinia;

3. Has a previous illness diagnosed by a health care provider, within the past three months due to salmonella typhi, without having received antibiotic therapy, as determined by a health care provider;

4. Has been exposed to, or is the suspected source of, a confirmed disease outbreak, because the food employee or conditional employee consumed or prepared food implicated in the outbreak, or consumed food at an event prepared by a person who is infected or ill with:
   (a) Norovirus within the past forty-eight hours of the last exposure;
   (b) Shiga toxin-producing Escherichia coli within the past ten days of the last exposure;
   (c) Shigella spp., within the past four days of the last exposure;
   (d) Salmonella Typhi within the past fourteen days of the last exposure;
   (e) Hepatitis A virus within the past fifty days of the last exposure; or
   (f) Has been exposed by attending or working in a setting where there is a confirmed disease outbreak, or living in the same household as, and has knowledge about, an individual who works or attends a setting where there is a confirmed disease outbreak, or living in the same household as, and has knowledge about, an individual diagnosed with an illness caused by:
      (i) Norovirus within the past forty-eight hours of the last exposure;
      (ii) Shiga toxin-producing Escherichia coli within the past ten days of the last exposure;
      (iii) Shigella spp., within the past four days of the last exposure;
      (iv) Salmonella Typhi within the past fourteen days of the last exposure;
      (v) Hepatitis A virus within the past fifty days of the last exposure;
      (vi) The person in charge shall notify the licensee when a food employee is diagnosed with an illness due to a pathogen specified under paragraph (A)(2) of this rule.

(C) The person in charge shall ensure that a conditional employee:

1. Who exhibits or reports a symptoms as specified under paragraph (A)(1) of this rule, or who reports a diagnosis of illness as specified under paragraph (A)(2) or (A)(3) of this rule, is prohibited from becoming a food employee until the conditional employee meets the criteria as specified under paragraph (E) of this rule.

2. Who works as a food employee in a food service operation or retail food establishment that serves a highly susceptible population and reports a history of exposure as specified under paragraphs (A)(1) and (A)(2) of this rule, is prohibited from becoming a food employee until the conditional employee meets the criteria as specified under paragraph (E) of this rule.

(D) Conditions of exclusion and restriction - evaluations and restrictions.

1. The person in charge shall restrict the duties of a food employee of a food service operation or retail food establishment that has any of the symptoms listed in paragraph (A)(1) of this rule; and

2. The person in charge shall restrict the duties of a food employee or exclude a food employee diagnosed with illnesses listed in paragraph (A)(2) of this rule from a food service operation or retail food establishment in accordance with rule 3701:3-13 of the Administrative Code.

(E) Removal of exclusions and restrictions.

3. The person in charge may remove an exclusion or restriction specified under paragraph (D) of this rule if the food employee is released by a health care provider or by approval of the licensee. This provision does not prohibit a person in charge from removing the restriction of a food employee if the restriction was due to symptoms listed in paragraph (A)(1) of this rule, the symptoms have ceased, and the illness was not from an infectious disease agent listed in paragraph (A)(2) of this rule.


(P) "Product" means a biological, chemical, or physical property that may cause an unacceptable consumer health risk.

(29) "Verminically treated container" means a container that is designed and intended to be secure against the entry of microbes and, in the case of low acid canned foods, to maintain the commercial sterility of its contents after processing.

(56) "Highly susceptible population" means people who are more likely than other people in the general population to experience foodborne disease because they are:
   (a) Immunocompromised; preschool age children, or older adults; and
   (b) Obtaining food at a facility that provides services such as custodial care, health care, or assisted living, such as a child or adult day care center, residential care facility, hospital or nursing home, or nutritional or socialization services such as a senior center.

(67) "Infected" means manipulating meat to which a solution has been introduced into its interior by processes that are referred to as "injection," "pump marinating," or "stibb pumping."

(58) "Sauce" means the aqueous liquid expressed or extracted from one or more fruits or vegetables, purées of the edible portions of one or more fruits or vegetables, or any concentrates of such liquid or purée. Sauce includes juice as a whole beverage, an ingredient of a beverage and a purée as an ingredient of a beverage.

(39) "Kitchenserver" means food preparation and storage utensils.

(50) "Clean" means applicable local, state, and federal statutes, regulations, and ordinances.

(51) "License" means the document issued by the licensee that authorizes a person to operate a food service operation or retail food establishment.

(52) "Licensee" means the entity that:
   (a) Is legally responsible for the operation of the food service operation or retail food establishment such as the owner, the owner's agent, or another person; and

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4th Quarter 2020
Please use the checklist below to assess your facility’s compliance with requirements outlined in Responsible Restart Ohio guidelines for reopening Food Facilities

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>No self-service- including straws, stir sticks, buffets, condiments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Self service beverage stations are allowable)</td>
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<tr>
<td>Employees must perform daily symptom assessments. Require employees</td>
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<tr>
<td>to stay home if symptomatic of COVID-19</td>
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<tr>
<td>Ensure hand washing by employees when changing tasks, when hands become</td>
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<td>contaminated and at a minimum of once every 2 hours</td>
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<tr>
<td>Ensure social distancing between employees. Provide COVID-19</td>
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<tr>
<td>compliant floor plan for kitchen</td>
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<tr>
<td>Post COVID-19 compliant seating plan that ensures social distancing and</td>
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<tr>
<td>states maximum dining capacity</td>
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<td>Number of employees permitted in break room limited to 10</td>
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<tr>
<td>Compliance with OAC training requirements for Person In Charge (PIC) and</td>
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<tr>
<td>Manager Certification</td>
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<td>Provide training for staff on Covid-19 prevention</td>
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<td>Have a plan to immediately isolate and seek medical care for any</td>
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<tr>
<td>person who develops symptoms of COVID-19 while at the facility. Shut down</td>
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<tr>
<td>areas affected for deep sanitation if possible</td>
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<tr>
<td>Perform enhanced cleaning of commonly touched surfaces such as doorknobs,</td>
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<tr>
<td>railings, and counter tops at least every 2 hours</td>
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<tr>
<td>Ensure high volume shared surfaces in congregate areas including playing</td>
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<tr>
<td>cards, arcade controllers and pool cues are cleaned between customers</td>
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<tr>
<td>Clean and sanitize tables, chairs, and menus between customers</td>
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<tr>
<td>Ensure online and remote access reflects changes in response to</td>
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<tr>
<td>COVID-19</td>
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<tr>
<td>Provide access to hand sanitizer for customers</td>
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<tr>
<td>Reservations of no more than 10 people per party</td>
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</tr>
<tr>
<td>Ensure distancing of 6 feet between parties, otherwise use barriers.</td>
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<tr>
<td>Barriers must meet all applicable building and fire code requirements</td>
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<tr>
<td>Maintain compliance with ODH sanitation and food safety regulations</td>
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</tr>
</tbody>
</table>

“Healthy People, Healthy Habits, Healthy Communities”

Environmental Health * Plumbing * Keep Delaware County Beautiful * Vital Statistics * Clinic Services * Health and Safety Education * WIC
FIGURE 3. Delaware County COVID-19 Inspection Form (DeGenaro, 2020)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add COVID-19 symptoms to the current Employee Illness Policy required by the Food Code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All employees must wear face masks with the following exceptions and with documentation:</td>
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<tr>
<td>- Facial coverings in the work setting are prohibited by law or regulation</td>
<td></td>
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<tr>
<td>- Facial coverings are in violation of documented industry standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Facial coverings are not advisable for health reasons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Facial coverings are in violation of the business’ documented safety policies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Facial coverings are not required when the employee works alone in an assigned work area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- There is a functional (practical) reason for an employee not to wear a facial covering in the workplace</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References:


