DR. MATT HEINZ
Supervisor
District 2

33 N Stone Ave., 11th Floor
Tucson, AZ 85701
(520) 724-2702
district2@pima.gov

Pima County Board of Supervisors

To: Melissa Manriquez, Clerk of the Board

From: Dr. Matt Heinz, Supervisor, District 2

Date: December 16, 2021

RE: BOS Addendum Agenda 12/21/21: Countywide Mask Mandate – Indoor Public Places

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Please add this item to the Addendum Agenda for 12/21/21. Thank you.

Board of Supervisors:

Discussion/Direction/Action: Adopting Resolution 2021-___, Resolution of the Pima County Board of Supervisors adopting regulations necessary for the public health and safety of Pima County's inhabitants, requiring persons to wear face coverings when they are in indoor public places and cannot easily maintain a continuous physical distance of at least 6 feet from all other persons. Per the language of the Resolution, this requirement shall be in effect upon adoption of the Resolution and "will remain in effect at least through February 28, 2022, pending case counts and hospitalization rates in our community and any further action by the Board."

In addition to all the public health reasons cited in the proposed Resolution for reinstating a countywide mask mandate at this critical moment in the pandemic, it is important to note that without such a mandate, we can assume that local businesses will suffer. Individuals who cannot be assured that their fellow Pima County residents are going to be masking up may simply choose to stop patronizing restaurants and other local businesses altogether in order to protect their health and that of their families. Omicron has already been identified in Pima County, and people are looking for assurances that it remains safe to go about their lives. It is just not safe without everybody masking. An increase in masking by even just 15% could prevent lockdowns and reduce losses up to $1 trillion nationally, or 5% of gross domestic product, according to recent economic analyses.

cc: Jan Lesher, Acting County Administrator
Dr. Francisco García, Chief Medical Officer and Deputy County Administrator for Health and Community Services
Dr. Theresa Cullen, Director, Pima County Health Department
Sam Brown, Chief Civil Deputy County Attorney, Pima County Attorney's Office, Civil Division
Jonathan Pinkney, Supervising Attorney, Health Law Unit, Pima County Attorney's Office, Civil Division

RESOLUTION NO. 2021 - ____

RESOLUTION OF THE PIMA COUNTY BOARD OF SUPERVISORS ADOPTING REGULATIONS NECESSARY FOR THE PUBLIC HEALTH AND SAFETY OF PIMA COUNTY'S INHABITANTS, REQUIRING PERSONS TO WEAR FACE COVERINGS WHEN THEY ARE IN INDOOR PUBLIC PLACES AND CANNOT EASILY MAINTAIN A CONTINUOUS PHYSICAL DISTANCE OF AT LEAST 6 FEET FROM ALL OTHER PERSONS.

The Board of Supervisors of Pima County, Arizona finds:

1. On March 11, 2020, Arizona Governor Doug Ducey declared a State of Emergency related to the Covid-19 outbreak. On that date, there were 124,908 total confirmed cases and 4,591 total confirmed deaths from COVID-19 *worldwide*. As of December 15, 2021, according to the Governor's most recent Executive Order (*E.O. 2021-21 -- Enhanced Surveillance Advisory: Monitoring and Preventing the Spread of COVID-19*), there have been 1,323,997 diagnosed cases of COVID-19 in *Arizona*, including 23,324 deaths in Arizona so far. The governor's State of Emergency declaration remains in effect.

2. The Covid-19 pandemic is the worst public-health crisis the United States has faced in a century. It has now caused over 800,000 confirmed deaths in the United States, and experts warn we could reach a previously unthinkable 1 million American deaths before the middle of 2022 if we do not dramatically increase our layered mitigation efforts, including most importantly, universal vaccination and masking.

3. As noted in the updated Science Brief by the Centers for Disease Control and Prevention (CDC), updated December 6, 2021, entitled *Science Brief: Community Use of Masks to Control the Spread of SARS-CoV-2* and included by reference as part of this Resolution, at least eighteen studies have confirmed the benefit of universal masking in community level analyses of COVID-19 transmission, including in transmission of "variants of concern" such as Omicron. *Two of these studies and an additional analysis of data from 200 countries that included the U.S. also demonstrated reductions in mortality. Another 10-site study showed reductions in hospitalization growth rates following mask mandate implementation.*

4. On June 19, 2020, the Pima County Board of Supervisors adopted Resolution 2020-49, requiring all persons in Pima County who were not exempt under that Resolution to wear compliant face coverings while in public, both indoors and outdoors, and unable to easily and continuously physically distance from others. At that time, the caseload in Pima County was 203 cases per 100,000 residents per week. Today, Pima County's average rate of new infections for the previous month is more than 330 per 100,000 residents per week, and recently reached 400 new cases per 100,000 residents in one week.

5. On December 4, 2020, as the last winter surge was filling up our hospital beds across the county, the Pima County Board of Supervisors adopted Resolution 2020-96, requiring all persons in Pima County who were not exempt under that Resolution to wear compliant face coverings while in public and unable to easily and continuously physically distance from others, and additionally *mandating* that businesses refuse to allow a person who was not exempt and who refused to wear a face covering from entering or staying in the establishment.

6. One May 14, 2021 with the caseload having dropped for over one month to below 10 new cases per 100,000 county residents per week, and vaccinations available to all adults in the county, the Pima County Board of Supervisors adopted Resolution 2021-35, lifting the requirement for individuals to wear face coverings in public settings and replacing it with a recommendation to continue to do so.

7. Since early August 2021, Arizona – and Pima County – has again been experiencing alarming community spread of Covid-19 and decreased availability of necessary healthcare resources, including hospital and intensive care beds. Since August 14, 2021, community spread of Covid-19 in Pima County has been classified as "high" by the Centers for Disease Control and Prevention (CDC), which currently recommends that "Everyone in **Pima County, Arizona** should wear a mask in public, indoor settings." (https://covid.cdc.gov/covid-data-tracker)

8. As of December 15, 2021: There are only three (3) ICU Beds available in all of Pima County, and overall ICU bed capacity countywide has been below 5% for 57 days and counting. Thirty four percent (34%) of all ICU beds are in use by COVID-19 positive patients, and there are currently zero Pediatric ICU beds available in Pima County.

9. As of December 15, 2021: A total of 389 COVID-19 positive inpatients are currently in Pima County hospitals, with the daily admissions continuing to exceed the daily discharges day after day. Additionally, Emergency Room beds are currently occupied at 77% of total capacity. The healthcare system is under enormous strain, even as we brace for the arrival of the Omicron variant in Pima County.

10. For the period from November 22, 2021 through December 13, 2021, Pima County hospitals have reported 155 total deaths due to COVID-19, or an average of 51.7 deaths per week.

11. While the percentage of Pima County residents fully vaccinated and boosted continues to increase, we continue to have areas of the state where vaccine coverage is low, putting individuals and communities at greater risk for COVID-19. Given the current hospital census, which is at or over capacity, even a moderate surge in cases and hospitalizations could materially impact Pima County's health care delivery system.

12. Implementing a universal masking requirement not only has proven to decrease the rate of infections but also is able to slow community transmission. A series of cross-sectional surveys in the U.S. suggested that a 10% increase in self-reported mask wearing tripled the likelihood of slowing community transmission.

13. As part of the effort to mitigate the further spread of Covid-19 and protect our hospitals from becoming overwhelmed, more stringent and immediate enforcement of face-covering requirements is necessary.

14. Pima County, through both the Board of Supervisors and its Health Department, has broad authority to take action to protect the public health and safety of all Pima County's inhabitants, see A.R.S. § 11-251 (17); A.R.S. Title 36, Chapter 1, Article 4; *Marsoner v. Pima County*, 166 Ariz. 486 (1991), including authority to adopt and enforce "regulations necessary for the public health and safety of the inhabitants," A.RS.§ 36-183.02.

15. Furthermore, per the Arizona Supreme Court's decision in *Ariz. School Boards Assoc. Inc. v. State of Ariz.,* 2021 WL 4487632 (Sept. 27, 2021), striking down Section 39 of SB1819 as unconstitutional, the County is NOT prohibited from mitigating the COVID-19 pandemic with any measure that may impact private entities, "including an order, rule, ordinance or regulation that mandates using face coverings."

NOW, THEREFORE, BE IT RESOLVED,

Section 1. Face coverings required in indoor public settings. Every person must wear a face covering that completely and snugly covers the person's nose and mouth when the person is in an indoor public place and cannot easily maintain a continuous distance of at least six feet from all other persons. For purposes of this Resolution:

a. "Face covering" does not include any mask that incorporates a one-way valve (typically a raised plastic cylinder about the size of a quarter on the front or side of the mask) that is designed to facilitate easy exhaling.

b. "Indoor public place" means any indoor place that is open to the public or a segment of the public and includes, but is not limited to, businesses, venues or other establishments where people assemble or members of the general public may enter; schools; offices; public buildings; and public transportation, including taxicabs and ride sharing.

Section 2. Exempt persons. Section 1 of this Resolution does not apply to:

a. Persons younger than five years old. Very young children (younger than 2 years old) must not wear a mask because of the risk of suffocation. Parents or guardians are responsible for ensuring that children between the ages of 5 and 17 wear appropriate face coverings as required under this Resolution.

b. Persons with a medical condition, mental health condition, or disability that prevents safely wearing a mask. This includes persons with a medical condition for whom wearing a mask could obstruct breathing or who are unconscious, incapacitated, or otherwise unable to remove a mask without assistance. A person is NOT required to provide documentation demonstrating that the person cannot medically tolerate wearing a face covering.

c. Persons who are hearing impaired, or communicating with a person who is hearing impaired, where the ability to see the mouth is essential for communication.

d. Persons for whom wearing a mask would create a risk to the person related to their work, as determined by local, state, or federal regulators or workplace safety guidelines.

e. Persons who are obtaining a service involving the nose, face, or head for which temporary removal of the face covering is necessary to perform the service.

f. Persons who are eating or drinking at a restaurant or other establishment that offers food or beverage service, so long as the person is able to maintain a distance of 6 feet away from persons who are not members of the same household or party as the person.

g. Persons who are swimming.

h. For any activity not listed for exemption, an exemption may be granted on a case by-case basis from the Pima County Chief Medical Officer or the Director of the Pima County Health Department. General descriptions of exemptions granted will be posted on a website accessible via www.pima.gov, without identifying who requested the exemption.

Section 3. Establishments. Indoor Establishments that are open to the public must provide face coverings to their employees and require them to wear them . Additionally, establishments that are open to the public and in which continuous physical distancing of at least six feet between persons cannot be easily maintained may refuse to allow a person who is not exempt under Section 2 and who is not wearing a face covering to enter the establishment and may request that a person inside the establishment leave if the person is not exempt under Section 2 and is not wearing a face covering.

Section 4. Compliance and enforcement. The primary focus of enforcement is education and promotion of best practices to accomplish the goal of mitigating the spread of COVID-19 in our community. A person must be notified of the provisions of this Resolution and given an opportunity to comply before any further enforcement action may be taken. Further enforcement action may thereafter be taken in any manner provided by law, including as provided in A.R.S. §§ 36-183.04 through 36-183.07 or 36-191. However, no civil or criminal enforcement action may be taken without the express approval of the Pima County Board of Supervisors.

Section 5. Applicability. This Resolution applies throughout Pima County, including within incorporated areas.

Section 6. Effective date. This Resolution, as an emergency measure necessary for the immediate preservation of the peace, health or safety of Pima County, is effective upon adoption, and will remain in effect at least through February 28, 2022, pending case counts and hospitalization rates in our community and any further action by the Board.

PASSED AND ADOPTED this 21st day of December, 2021.

Sharon Bronson, Chair
Pima County Board of Supervisors

ATTEST:

Melissa Manriquez,
Clerk of the Board

APPROVED AS TO FORM:

Sam Brown
Chief Civil Deputy County Attorney

Science Brief: Community Use of Masks to Control the Spread of SARS-CoV-2

Updated Dec. 6, 2021

Summary of Recent Changes

Last updated December 6, 2021

- Data were added from studies published since the last update. These studies address the association of mask wearing with new infections, including infections related to SARS-CoV-2 variants of concern. All of these studies demonstrated a benefit.
- A section was added on mask wearing among children.

Background

SARS-CoV-2 infection is transmitted predominantly by inhalation of respiratory droplets generated when people cough, sneeze, sing, talk, or breathe. CDC recommends community use of masks to prevent transmission of SARS-CoV-2. Masks are primarily intended to reduce the emission of virus-laden droplets by the wearer ("source control"), which is especially relevant for asymptomatic or presymptomatic infected wearers who feel well and may be unaware of their infectiousness to others (estimated to account for more than 50% of SARS-CoV-2 transmissions).[1, 2] Masks also help reduce inhalation of these droplets by the wearer ("filtration for wearer protection"). The community benefit of masking for SARS-CoV-2 control is due to the combination of these two effects (source control and filtration for wearer protection); individual prevention benefit increases with increasing numbers of people using masks consistently and correctly.

Source Control to Block Exhaled Virus

Multi-layer cloth masks block release of exhaled respiratory particles into the environment,[3-6] along with any microorganisms associated with these particles.[7, 8] Cloth masks not only effectively block most large droplets (i.e., 20-30 microns and larger),[9] but they can also block the exhalation of fine droplets and particles (also often referred to as aerosols) smaller than 10 microns[3, 5] which increase in number with the volume of speech[10-12] and specific types of phonation.[13] Multi-layer cloth masks can both block 50-70% of these fine droplets and particles[3, 14] and limit the forward spread of those that are not captured.[5, 6, 15, 16] Upwards of 80% blockage has been achieved in human experiments,[4] with cloth masks in some studies performing on par with surgical masks as barriers for source control.[3, 9, 14, 17] In one study, conducted prior to widespread circulation of the Delta variant, masks worked equally well for blocking aerosolized particles containing both "wild-type" virus and the Alpha variant (a more infectious variant).[17]

Filtration for Wearer Protection

Studies demonstrate that cloth mask materials can also reduce wearers' exposure to infectious droplets through filtration, including filtration of fine droplets and particles less than 10 microns. The relative filtration effectiveness of various masks has varied widely across studies, in large part due to variation in experimental design and particle sizes analyzed. Multiple layers of cloth with higher thread counts have demonstrated superior performance compared to single layers of cloth with lower thread counts, in some cases filtering nearly 50% of fine particles less than 1 micron.[14, 18-30] Some materials (e.g., polypropylene) may enhance filtering effectiveness by generating triboelectric charge (a form of static electricity) that enhances capture of charged particles[20] while others (e.g., silk) may help repel moist droplets[31] and reduce fabric wetting and thus maintain breathability and comfort. In addition to the number of layers and choice of materials, other techniques can improve wearer protection by improving fit and thereby filtration capacity. Examples include but are not limited to mask fitters, knotting-and-tucking the ear loops of medical procedures masks, using a cloth mask placed over a medical procedure mask, and nylon hosiery sleeves.[32-36]

Human Studies of Masking and SARS-CoV-2 Transmission

- A large, well-designed cluster-randomized trial in Bangladesh in late 2020 found that surgical or cloth mask distribution, role-modeling, and active mask promotion tripled mask use to 42.3% in intervention villages compared to 13.3% in comparison villages. In villages receiving mask interventions, symptomatic seroprevalence of SARS-CoV-2 was reduced by approximately 9% relative to comparison villages. In villages randomized to receive surgical masks, symptomatic seroprevalence of SARS-CoV-2 was significantly lower (relative reduction 11.1% overall). The results of this study show that even modest increases in community use of masks can effectively reduce symptomatic SARS-CoV-2 infections (COVID-19).[37]
- A study of an outbreak aboard the USS Theodore Roosevelt, an environment notable for congregate living quarters and close working environments, found that use of face coverings on-board was associated with a 70% reduced risk of infection.[38]
- In a study of 124 Beijing households with ≥ 1 laboratory-confirmed case of SARS-CoV-2 infection, mask use by the index patient and family contacts before the index patient developed symptoms reduced secondary transmission within the households by 79%.[39]
- A study examining SARS-CoV-2 secondary attack rates among eight public K-12 school districts in Massachusetts (70 schools with >33,000 enrolled students) during the 2020–21 school year found an unadjusted secondary attack rate of 11.7% for unmasked versus 1.7% for masked interactions.[40]
- A retrospective case-control study from Thailand documented that, among more than 1,000 persons interviewed as part of contact tracing investigations, those who reported having always worn a mask during high-risk exposures experienced a greater than 70% reduced risk of acquiring infection compared with persons who did not wear masks under these circumstances.[41]
- During July 15–August 31, 2021, when Delta was the predominant strain circulating in the U.S., about one in five K–12 public non-charter schools open for in-person learning in Maricopa and Pima Counties, Arizona, experienced a school-associated outbreak. Outbreaks were three and a half times more likely (adjusted odds ratio 3.5, 95% confidence interval 1.8-6.6) in schools without mask mandates.[42]
- In a nationwide analysis of data collected during July 1-September 4, 2021, U.S. counties without school mask requirements experienced larger increases in pediatric COVID-19 case rates (18.53 per 100,000 per day more cases) after the start of school compared with counties with school mask requirements.[43]
- An investigation of a high-exposure event in the U.S., in which 2 symptomatically ill hair stylists interacted for an average of 15 minutes with each of 139 clients during an 8-day period, found that none of the 67 clients who subsequently consented to an interview and testing developed infection. The stylists and all clients universally wore masks in the salon as required by local ordinance and company policy at the time.[44]
- Investigations involving infected passengers aboard flights longer than 10 hours strongly suggest that masking prevented in-flight transmissions, as demonstrated by the absence of infection developing in other passengers and crew in the 14 days following exposure.[45, 46]

At least ten studies have confirmed the benefit of universal masking in community level analyses: in a unified hospital system,[47] a German city,[48] two U.S. states,[49, 50] a panel of 15 U.S. states and Washington, D.C.,[51, 52] as well as both Canada[53] and the U.S.[54-56] nationally. Each analysis demonstrated that, following directives from organizational and political leadership for universal masking, new infections fell significantly. Two of these studies[51, 52] and an additional analysis of data from 200 countries that included the U.S.[56] also demonstrated reductions in mortality. Another 10-site study showed reductions in hospitalization growth rates following mask mandate implementation.[54] A separate series of cross-sectional surveys in the U.S.

suggested that a 10% increase in self-reported mask wearing tripled the likelihood of stopping community transmission.[57] An economic analysis using U.S. data found that, given these effects, increasing universal masking by 15% could prevent the need for lockdowns and reduce associated losses of up to $1 trillion or about 5% of gross domestic product.[52]

Two studies have been improperly characterized by some sources as showing that surgical or cloth masks offer no benefit.[58,59] A community-based randomized control trial in Denmark during 2020 assessed whether the use of surgical masks reduced the SARS-CoV-2 infection rate among wearers (personal protection) by more than 50%.[58] Findings were inconclusive,[58] most likely because the actual reduction in infections was lower. The study was too small (i.e., enrolled about 0.1% of the population) to assess whether masks could decrease transmission from wearers to others (source control). A second study of 14 hospitals in Vietnam during 2015 found that cloth masks were inferior to surgical masks for protection against clinical upper respiratory illness or laboratory-confirmed viral infection.[59] The study had a number of limitations including the lack of a true control (no mask) group for comparison, limited source control as hospitalized patients and staff were not masked, unblinded study arm assignments potentially biasing self-reporting of illness, and the washing and re-use of cloth masks by users introducing the risk of infection from self-washing. A follow up study in 2020 found that healthcare workers whose cloth masks were laundered by the hospital were protected equally as well as those that wore medical masks.[60]

Potential Adverse Health Effects of Mask Wearing

Adults

Research supports that under most circumstances, mask wearing has no significant adverse health effects for wearers. Studies of healthy hospital workers, older adults, and adults with chronic obstructive pulmonary disease (COPD) reported no to minimal changes in oxygen or carbon dioxide levels while wearing a cloth or surgical mask either during rest or moderate physical activity.[61-65] The safety of mask use during low to moderate levels of exercise has been confirmed in studies of healthy adults and adolescents.[64, 66-70] Some,[71-74] but not all,[67] studies have found that during intense exercise, especially when approaching the aerobic threshold, wearing a mask can increase dyspnea (difficulty breathing), perceived exertion, and claustrophobia, and produce modest negative effects on measured cardiopulmonary parameters. In some people, face masks worn for longer durations might be associated with skin reactions such as acne, itching, dry skin and worsening of existing dermatoses.[75-77] Wearing a surgical mask and N95 respirator may have a higher risk of skin reactions compared with a cloth mask.[76-78]

Children

A study of 60 elementary school children reported no adverse cardiovascular (e.g., heart rate) or pulmonary (e.g., peripheral oxygen saturation) effects among children while wearing a cloth face covering in a classroom for 30 consecutive minutes of instructional time.[79] A separate study observed no oxygen desaturation or respiratory distress after 60 minutes of monitoring among children less than 2 years of age when masked during normal play.[80] A randomized trial among 40 children aged 3–10 years old scheduled for elective surgery, found that protective surgical face masks could be used safely in the postoperative period.[81] In a prospective school-based cohort study of children aged 10–17 years who wore masks for 6–7 hours during the school day, some children self-reported general (4–7%) or situation-specific (2–4%) side-effects such as skin irritation, headache, or difficulty breathing during physical education.[82]

The potential impact of masks on language and emotional development has been examined in several studies.[83-89] Some research suggests children and adults, and especially toddlers (aged 3–5 years) can have difficulty inferring emotion from facial features presented on photographs of persons with their lower facial features covered by a mask.[83] However, a study of 7- to 13-year-old children determined the decrement in emotional inference observed when the lower half of a photographed face was covered with a mask was equivalent to that associated with covering the eyes with sunglasses, leading the authors to conclude that in combination with other contextual cues, masks are unlikely to produce serious impairments of children's social interactions.[84] A study of 2-year-old children concluded that they were able to recognize familiar words presented without a mask and when hearing words through opaque masks.[85] Among children with autism spectrum disorders (ASD), interventions including positive reinforcement and coaching caregivers to teach mask wearing have improved participants' ability to wear a face mask.[86-88] These findings suggest that even children who may have difficulty wearing a mask can do so effectively through targeted interventions.

Conclusions

Experimental and epidemiologic data support community masking to reduce the spread of SARS-CoV-2, including alpha and delta variants, among adults and children. The prevention benefit of masking is derived from the combination of source control and wearer protection. The relationship between source control and wearer protection is likely complementary and possibly synergistic, so that individual benefit increases with increasing community mask use. Mask use has been found to be safe and is not associated with clinically significant impacts on respiration or gas exchange under most circumstances, except for intense exercise. The limited available data indicate no clear evidence that masking impairs emotional or language development in children. Further research is needed to assess masks, particularly to identify the combinations of materials that maximize both their blocking and filtering effectiveness, as well as fit, comfort, durability, and consumer appeal.

Table: Summary of studies that have assessed the effect of mask wearing on COVID-19 infection risks

	Type of investigation	Location	Study months	Population studied	Intervention	Outcome
Abaluck[37]	Cluster-randomized trial	Bangladesh	Nov 2020–April 2021	342,183 adults in 572 villages	Mask promotion strategies	In villages receiving mask interventions, symptomatic seroprevalence of SARS-CoV-2 was reduced by approximately 9% (adjusted prevalence ratio 0.91, 95% CI 0.82-1.00) relative to comparison villages
Payne[38]	Cohort study	USS Theodore Roosevelt, Guam (USA)	March 2020	382 U.S. Navy service members	Mask wearing (self-report)	Masking reduced risk of infection by 70% (unadjusted OR 0.30, 95% CI = 0.17–0.52)
Wang Y[39]	Cohort study	Households in Beijing (China)	February–March 2020	124 households of diagnosed cases comprising 335 people	Mask wearing by index cases or ≥1 household member prior to index case's diagnosis (self-report)	Masking reduced risk of secondary infection by 79% (adjusted OR 0.21, 95% CI = 0.06–0.79)
Hendrix[44]	Cohort study	Hair salon in Springfield, MO (USA)	May 2020	2 symptomatically infected stylists and 139 patrons	Universal masking in salon (by local ordinance and company policy)	No COVID-19 infections among 67 patrons who were tested in follow-up

	Type of investigation	Location	Study months	Population studied	Intervention	Outcome
Doung-Ngern[41]	Case-control study	Bangkok (Thailand)	April–May 2020	839 close contacts of 211 index cases	Mask wearing by contact at time of high-risk exposure to case (self-report)	Always having used a mask reduced infection by 77% (adjusted OR 0.23, 95% CI = 0.096–0.60)
Gallaway[49]	Population-based intervention	Arizona (USA)	January–August 2020	State population	Mandatory mask wearing in public	Temporal association between institution of masking policy and subsequent decline in new diagnoses
Rader[57]	Serial cross-sectional surveys	USA	June–July 2020	374,021 persons who completed web-based surveys	Self-reported mask wearing in grocery stores and in the homes of family or friends	10% increase in mask wearing tripled the likelihood of stopping community transmission (adjusted OR 3.53, 95% CI = 2.03-6.43)
Wang X[47]	Population-based intervention with trend analysis	Boston, MA (USA)	March–April 2020	9,850 healthcare workers (HCW)	Universal masking of HCW and patients, Mass General Brigham health care system	Estimated daily decline in new diagnoses among HCW of 0.49%
Mitze[48]	Population-based intervention with trend analysis	Jena (Thuringia), Germany	April 2020	City population aged ≥15 years	Mandatory mask wearing in public spaces (e.g., public transport, shops)	Estimated daily decline in new diagnoses of 1.28 percentage points
Van Dyke[50]	Population-based intervention with trend analysis	Kansas (USA)	June–August 2020	State population	Mandatory mask wearing in public spaces	Estimated case rate per 100,000 decreased by 0.08 in counties with mask mandates but increased by 0.11 in those without

	Type of investigation	Location	Study months	Population studied	Intervention	Outcome
Lyu and Wehby[51]	Population-based intervention with trend analysis	15 U.S. states and Washington, DC	March–May 2020	State population	Mandatory mask wearing in public	Estimated overall initial daily decline in new diagnoses of 0.9%, grew to 2.0% at 21 days following mandates
Joo[54]	Population-based intervention with trend analysis	USA	March–October 2020	State populations	Mandatory mask wearing in public	Estimated decline in weekly hospitalization rates by 5.6 percentage points for adults aged 18–64 years after mandate implementation, compared with growth rates during the 4 weeks preceding implementation of the mandate
Guy[56]	Population-based intervention with trend analysis	2,313 counties, USA	March–December 2020	County population	Mandatory mask wearing in public	Estimated overall initial daily decline in new diagnoses of 0.5%, grew to 1.8% at 81–100 days following mandates; estimated overall initial daily decline in deaths of 0.7%, grew to 1.9% at 81-100 days following mask mandate implementation

	Type of investigation	Location	Study months	Population studied	Intervention	Outcome
Jehn[42]	Population-based intervention with trend analysis	Arizona (USA)	July–August 2021	1,020 K–12 schools	School mask policies	Odds of a school-associated COVID-19 outbreak in schools without a mask requirement were 3.5 times higher than those in schools with an early mask requirement (OR = 3.5; 95% CI = 1.8–6.9)
Budzyn[43]	Population-based intervention with trend analysis	USA	July–September 2021	520 counties	School mask requirements	Increases in pediatric COVID-19 case rates during the start of the 2021–22 school year were smaller in U.S. counties with school mask requirements than in those without school mask requirements
Karaivanov[53]	Counterfactual modeling using national data	Canada	March–August 2020	County population	Mandatory mask wearing indoors	Estimated weekly 22% decline in new diagnoses following mask mandates

	Type of investigation	Location	Study months	Population studied	Intervention	Outcome
Chernozhukov[55]	Counterfactual modeling using national data	USA	March–May 2020	State population	Mandatory mask wearing for employees in public businesses	Nationally mandating face masks for employees early in the pandemic could have reduced weekly growth rate of cases and deaths by more than 10 percentage points in late April and 34% (95% CI: 19–47%) fewer deaths nationally by end of May
Leffler[90]	Population-based intervention with trend analysis	169 countries	January–May 2020	County population	Mask wearing by tradition, mandate, or recommendation	Duration of mask wearing by the public was negatively associated with per-capita mortality from COVID-19

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More Information

The Science of Masking to Control COVID-19 [PDF – 28 slides]

The Science of Masking to Control COVID-19 (Abbreviated) [PDF – 7 slides]

Last Updated Dec. 6, 2021

RESOLUTION NO. 2020-_49_

RESOLUTION OF THE PIMA COUNTY BOARD OF SUPERVISORS ADOPTING REGULATIONS NECESSARY FOR THE PUBLIC HEALTH AND SAFETY OF PIMA COUNTY'S INHABITANTS, REQUIRING PERSONS TO WEAR FACE COVERINGS WHEN THEY ARE IN PUBLIC PLACES AND CANNOT EASILY MAINTAIN A CONTINUOUS PHYSICAL DISTANCE OF AT LEAST 6 FEET FROM ALL OTHER PERSONS

The Board of Supervisors of Pima County, Arizona finds:

1. On March 19, 2020, Pima County adopted Resolution 2020-18, declaring a state of emergency related to the Covid-19 outbreak. That state of emergency remains in effect.

2. The Covid-19 pandemic is the worst public-health crisis the United States has faced in a century. It has caused over 117,000 confirmed deaths in the United States and infected over 2.1 million people, though the actual numbers of deaths and infections are very likely higher. Many of those who survive Covid-19 will do so only after experiencing serious illness and lengthy hospitalization.

3. On May 15, Governor Doug Ducey allowed his "Stay Home, Stay Healthy, Stay Connected" order, Executive Order 2020-18, to expire, and in its place issued Executive Order 2020-36, "Stay Healthy, Return Smarter, Return Stronger," allowing businesses to reopen subject to physical-distancing and sanitation guidelines.

4. As businesses began to reopen in Arizona and other states, media outlets began reporting on and posting images of people gathering in large groups and failing to abide by physical-distancing guidelines.

5. Since the expiration of Executive Order 2020-18, and in particular in the last two-to-three weeks, Arizona has become a Covid-19 hotspot. It has seen a rapid rise in cases statewide. Before May 15, Arizona had not had a day with more than 560 reported new cases. In recent days over three times that number have been reported per day. Covid-19 hospitalizations, including hospitalizations in intensive-care units, are at record highs. The Director of the Arizona Department of Health Services has asked all hospitals to activate their emergency plans.

6. Arizona's sharp uptick in cases has alarmed public-health experts across the country.

7. SARS-CoV-2, the novel coronavirus that causes Covid-19, is believed to be spread most commonly through respiratory droplets, and a person who is not experiencing

symptoms may still be able to spread the virus to others. Studies have shown that face coverings may inhibit the virus from spreading from the wearer to others by keeping respiratory droplets containing the virus from traveling through the air to others. In other words, though face coverings may not protect the wearer, they likely protect others from the wearer, who may unknowingly be infected.

8. Accordingly, in addition to social-distancing and sanitation measures, the Centers for Disease Control (CDC) "recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies) especially in areas of significant community-based transmission."

9. As shown by the rapid increase in reported cases, Arizona is seeing significant community-based transmission of Covid-19. Indeed, Governor Ducey recently stated that "Covid-19 is widespread in Arizona" and issued Executive Order 2020-40, "Containing the Spread of COVID-19," which requires businesses to comply with applicable guidance, subjecting them to enforcement if they fail to do so, and provides that cities, towns, and counties are not prohibited by A.R.S. § 26-307 from adopting policies regarding wearing face coverings in public.

10. All Arizonans should be wearing face coverings when in public settings when it is not easy to stay at least six feet from others.

11. Pima County, through both the Board of Supervisors and its Health Department, has broad authority to take action to protect the public health and safety of all Pima County's inhabitants, *see* A.R.S. § 11-251(17); A.R.S. Title 36, Chapter 1, Article 4; *Marsoner v. Pima County*, 166 Ariz. 486 (1991), including authority to adopt and enforce "regulations necessary for the public health and safety of the inhabitants," A.R.S. § 36-183.02.

12. The adoption of regulations requiring all Pima County inhabitants, including those in cities and towns in Pima County, to wear face coverings when in public places where adequate physical-distancing cannot be easily maintained is necessary to protect the public health and safety of Pima County's inhabitants.

NOW, THEREFORE, BE IT RESOLVED,

Section 1. *Face coverings required.* Every person must wear a face covering that completely and snugly covers the person's nose and mouth when the person is in a public place and cannot easily maintain a continuous distance of at least six feet from all other persons. For purposes of this Resolution:

a. "Face covering" does not include any mask that incorporates a one-way valve (typically a raised plastic cylinder about the size of a quarter on the front or side of the mask) that is designed to facilitate easy exhaling.

b. "Public place" means any place, indoor or outdoor, that is open to the public and includes, but is not limited to, businesses or other establishments where people assemble or members of the general public may enter; offices; public buildings, highways, and parks; and public transportation, including taxicabs and ride sharing.

Section 2. *Exempt persons.* Section 1 of this Resolution does not apply to:

a. Children under the age of 5. Parents or guardians are responsible for ensuring that children between the ages of 5 and 17 wear appropriate face coverings when required under this Resolution.

b. Persons who cannot medically tolerate wearing a face covering. A person is not required to provide documentation demonstrating that the person cannot medically tolerate wearing a face covering.

c. Persons who are hearing impaired, or communicating with a person who is hearing impaired, where the ability to see the mouth is essential for communication.

d. Persons, including on-duty law-enforcement officers, for whom wearing a face covering would create a risk to the person related to their work, as determined by local, state, or federal regulators or workplace safety guidelines.

e. Persons who are obtaining a service involving the nose, face, or head for which temporary removal of the face covering is necessary to perform the service.

f. Persons who are eating or drinking at a restaurant or other establishment that offers food or beverage service, so long as the person is able to maintain a distance of 6 feet away from persons who are not members of the same household or party as the person.

g. Any member of a group of persons who are in a public place together and live in the same household or are part of a party of 10 or less, so long as the group can easily maintain a continuous physical distance of at least 6 feet from all other persons not part of the household or party.

h. Persons who are engaged in outdoor work, recreation, or exercise, when alone or as part of a group of people who live in the same household or constitute a party of 10 or less, so long as they are able to easily maintain a continuous physical distance of at least 6 feet from all other persons not part of the same household or party.

i. Persons who are incarcerated.

j. Persons who are swimming.

k. For any activity not listed for exemption, an exemption may be granted on a case-by-case basis from the Pima County Chief Medical Officer and the Director of the Pima County Health Department. General descriptions of exemptions granted will be posted on a website accessible via www.pima.gov, without identifying who requested the exemption.

Section 3. *Establishments.* Establishments that are open to the public must provide face coverings to their employees and require them to wear them. Additionally, establishments that are open to the public and in which continuous physical distancing of at least six feet between persons cannot be easily maintained may refuse to allow a person who is not exempt under Section 2 and who is not wearing a face covering to enter the establishment and may request that a person inside the establishment leave if the person is not exempt under Section 2 and is not wearing a face covering.

Section 4. *Complaints and investigations.* Pima County will provide a public website available via www.pima.gov through which any person may file a written complaint alleging noncompliance with this Resolution at any establishment that is open to the public. The website will allow the submission of photographs, and, when possible, photographs depicting violations should be provided. The Pima County Health Department will investigate complaints and take enforcement action where appropriate. Pima County will post copies of the complaints and associated documentation, including photographs, on the website.

Section 5. *Compliance and enforcement.* The primary focus of enforcement is education and promotion of best practices to accomplish the goal of mitigating the spread of Covid-19. A person must be notified of the provisions of this Resolution and given an opportunity to comply before any further enforcement action is taken against the person. Further enforcement action may thereafter be taken in any manner provided by law, including as provided in A.R.S. §§ 36-183.04 through 36-183.07 or 36-191. No civil or criminal enforcement action will be taken without the express approval of the Board. In addition, if the Pima County Health Department investigates and finds noncompliance at an establishment, it may recommend to any governing body that issues a permit or license to that establishment, including when applicable the Arizona State Liquor Board, that the permit or license be suspended.

Section 6. *Applicability.* This Resolution applies throughout Pima County, including within incorporated areas.

Section 7. *Effective date.* This Resolution is effective upon adoption.

PASSED AND ADOPTED this 19th day of June, 2020.

Ramón Valadez JUN 19 2020

Ramón Valadez
Chairman, Pima County Board of Supervisors

ATTEST:

Julie Castañeda
Clerk of the Board

APPROVED AS TO FORM:

Andrew L. Flagg
Chief Civil Deputy County Attorney

RESOLUTION NO. 2020-96

RESOLUTION OF THE PIMA COUNTY BOARD OF SUPERVISORS ADOPTING REGULATIONS NECESSARY FOR THE PUBLIC HEALTH AND SAFETY OF PIMA COUNTY'S INHABITANTS, REQUIRING PERSONS TO WEAR FACE COVERINGS WHEN THEY ARE IN PUBLIC PLACES AND CANNOT EASILY MAINTAIN A CONTINUOUS PHYSICAL DISTANCE OF AT LEAST 6 FEET FROM ALL OTHER PERSONS

The Board of Supervisors of Pima County, Arizona finds:

1. On March 19, 2020, Pima County adopted Resolution 2020-18, declaring a state of emergency related to the Covid-19 outbreak. That state of emergency remains in effect.

2. The Covid-19 pandemic is the worst public-health crisis the United States has faced in a century. It has caused over 273,000 confirmed deaths in the United States and infected over 13.9 million people, though the actual numbers of deaths and infections are very likely higher. Many of those who survive Covid-19 will do so only after experiencing serious illness and lengthy hospitalization.

3. On June 19, 2020, the Pima County Board of Supervisors adopted Resolution 2020-49, requiring all persons in Pima County who are not exempt under that Resolution to wear compliant face coverings while in public and unable to easily and continuously physically distance from others. The Board hereby readopts and incorporates by reference the findings in Resolution 2020-49, as updated by those in this Resolution.

4. Section 5 of Resolution 2020-49 requires that the Board give express authorization before any civil or criminal enforcement of its requirements can be taken.

5. Arizona is again experiencing alarming community spread of Covid-19 and decreased availability of necessary healthcare resources, including hospital and intensive-care beds.

6. As part of the effort to mitigate the spread of Covid-19, more stringent enforcement of face-covering requirements is necessary.

7. Pima County, through both the Board of Supervisors and its Health Department, has broad authority to take action to protect the public health and safety of all Pima County's inhabitants, *see* A.R.S. § 11-251(17); A.R.S. Title 36, Chapter 1, Article 4; *Marsoner v. Pima County*, 166 Ariz. 486 (1991), including authority to adopt and enforce "regulations necessary for the public health and safety of the inhabitants," A.RS. § 36-183.02.

8. For purposes of clarity, the Board desires to readopt and restate the provisions of Resolution 2020-49, with amendments to Sections 3 and 5 and other clarifying amendments in Section 1(b).

NOW, THEREFORE, BE IT RESOLVED,

Section 1. *Face coverings required.* Every person must wear a face covering that completely and snugly covers the person's nose and mouth when the person is in a public place and cannot easily maintain a continuous distance of at least six feet from all other persons. For purposes of this Resolution:

a. "Face covering" does not include any mask that incorporates a one-way valve (typically a raised plastic cylinder about the size of a quarter on the front or side of the mask) that is designed to facilitate easy exhaling.
b. "Public place" means any place, indoor or outdoor, that is open to the public or a segment of the public and includes, but is not limited to, businesses or other establishments where people assemble or members of the general public may enter; schools; offices; public buildings, highways, and parks; and public transportation, including taxicabs and ride sharing.

Section 2. *Exempt persons.* Section 1 of this Resolution does not apply to:

a. Children under the age of 5. Parents or guardians are responsible for ensuring that children between the ages of 5 and 17 wear appropriate face coverings when required under this Resolution.
b. Persons who cannot medically tolerate wearing a face covering. A person is not required to provide documentation demonstrating that the person cannot medically tolerate wearing a face covering.
c. Persons who are hearing impaired, or communicating with a person who is hearing impaired, where the ability to see the mouth is essential for communication.
d. Persons, including on-duty law-enforcement officers, for whom wearing a face covering would create a risk to the person related to their work, as determined by local, state, or federal regulators or workplace safety guidelines.
e. Persons who are obtaining a service involving the nose, face, or head for which temporary removal of the face covering is necessary to perform the service.
f. Persons who are eating or drinking at a restaurant or other establishment that offers food or beverage service, so long as the person is able to maintain a distance of 6 feet away from persons who are not members of the same household or party as the person.
g. Any member of a group of persons who are in a public place together and live in the same household or are part of a party of 10 or less, so long as the group can easily maintain a continuous physical distance of at least 6 feet from all other persons not part of the household or party.
h. Persons who are engaged in outdoor work, recreation, or exercise, when alone or as part of a group of people who live in the same household or constitute a party of 10 or less, so long as they are able to easily maintain a continuous physical

distance of at least 6 feet from all other persons not part of the same household or party.

i. Persons who are incarcerated.
j. Persons who are swimming.
k. For any activity not listed for exemption, an exemption may be granted on a case-by-case basis from the Pima County Chief Medical Officer and the Director of the Pima County Health Department. General descriptions of exemptions granted will be posted on a website accessible via www.pima.gov, without identifying who requested the exemption.

Section 3. *Establishments.* Establishments that are open to the public must provide face coverings to their employees and require them to wear them. Additionally, establishments that are open to the public and in which continuous physical distancing of at least six feet between persons cannot be easily maintained must refuse to allow a person who is not exempt under Section 2 and who is not wearing a face covering to enter the establishment and must request that a person inside the establishment leave if the person is not exempt under Section 2 and is not wearing a face covering.

Section 4. *Complaints and investigations.* Pima County will provide a public website available via www.pima.gov through which any person may file a written complaint alleging noncompliance with this Resolution at any establishment that is open to the public. The website will allow the submission of photographs, and, when possible, photographs depicting violations should be provided. The Pima County Health Department will investigate complaints and take enforcement action where appropriate. Pima County will post copies of the complaints and associated documentation, including photographs, on the website.

Section 5. *Compliance and enforcement.*

a. A violation of Section 1 of this Resolution is a civil infraction that carries a penalty of $50 per infraction.
b. A violation of Section 3 of this Resolution by an establishment is a civil infraction that carries a penalty of $500 per infraction. In addition, if the Pima County Health Department investigates and finds noncompliance at an establishment, it may recommend to any governing body that issues a permit or license to that establishment, including when applicable the Arizona State Liquor Board, that the permit or license be suspended.
c. Nothing in this Resolution limits or precludes any other means of enforcement authorized by law.

Section 6. *Applicability.* This Resolution applies throughout Pima County, including within incorporated areas.

Section 7. *Effective date.* This Resolution is effective upon adoption.

Section 8. *Repeal of Resolution 2020-49.* This Resolution supersedes Resolution 2020-49, which is repealed upon the adoption of this Resolution, except that any investigation or enforcement taken under Resolution 2020-49 may continue until it has concluded, and any prior violations of Resolution 2020-49 may be considered prior noncompliance for purposes of investigations and enforcement under this Resolution.

PASSED AND ADOPTED this 4th day of December, 2020.

DEC 0 4 2020

Ramón Valadez
Chairman, Board of Supervisors

ATTEST:

Julie Castañeda, Clerk of the Board

APPROVED AS TO FORM:

Andrew L. Flagg, Deputy County Attorney

RESOLUTION NO. 2021-__35____

RESOLUTION OF THE PIMA COUNTY BOARD OF SUPERVISORS ADOPTING RECOMMENDATIONS FOR FACE MASK USE

The Board of Supervisors of Pima County, Arizona finds:

1. On March 19, 2020, Pima County adopted Resolution 2020-18, declaring a state of emergency related to the Covid-19 outbreak. That state of emergency remains in effect.

2. The Covid-19 pandemic is the worst public-health crisis the United States has faced in a century. It has caused over 580,000 confirmed deaths in the United States and infected over 32.6 million people, though the actual numbers of deaths and infections are very likely higher. Many of those who survive Covid-19 will do so only after experiencing serious illness and lengthy hospitalization.

3. There have been over 115,000 COVID-19 cases diagnosed in Pima County since the beginning of the pandemic. More than one out of every 450 residents of Pima County has died due to COVID-19.

4. COVID-19 is highly contagious and spreads primarily through person-to-person contact. Significant community and individual adherence to mitigation recommendations has been demonstrated to decrease illness and death. Starting in late November 2020, the Pima County Health Department identified an accelerated transmission of COVID-19 throughout Pima County that lasted until February 2021.

5. On December 4, 2020, the Pima County Board of Supervisors adopted Resolution 2020-96, requiring all persons in Pima County who are not exempt under that Resolution to wear compliant face coverings while in public and unable to easily and continuously physically distance from others. The Board hereby readopts and incorporates by reference the findings in Resolution 2020-96, as updated by those in this Resolution.

6. Compliance with mitigation measures and the availability of vaccines have resulted in a considerable decline in our case rate. Over 400,000 residents of Pima County have received COVID-19 vaccines. 49% of the population 18 or older have received a vaccination. Over 76% of people 65 and over have been vaccinated.

7. A growing body of evidence suggests that fully vaccinated people are less likely to have asymptomatic infection and to be able to transmit SARS-CoV-2 to others. Studies show full vaccination to be >90% effective in the real-world settings in preventing mild and severe disease, hospitalization, and death. If you're vaccinated, you're less likely to spread the virus.

8. In light of this evidence, the United States Centers for Disease Control and Prevention (CDC) updated its COVID-19 advice on May 13, 2021, eliminating the recommendation that fully vaccinated people wear masks in most public places.

9. Pima County, through both the Board of Supervisors and its Health Department, has broad authority to take action to protect the public health and safety of all Pima County's inhabitants, see A.R.S. § 11-251 (17); A.R.S. Title 36, Chapter 1, Article 4; Marsoner v. Pima County, 166 Ariz. 486 (1991), including authority to adopt and enforce "regulations necessary for the public health and safety of the inhabitants," A.R.S.§ 36-183.02.

NOW, THEREFORE, BE IT RESOLVED,

Section 1. Resolution 2020-96 is repealed.

Section 2. *Face coverings recommended.*

2.1 Every person who is reasonably able to do so and has not been fully vaccinated is advised to wear a face covering that completely and snugly covers the person's nose and mouth when the person is in a public place and cannot easily maintain a continuous distance of at least six feet from all other persons.

2.2 All persons, vaccinated or not, are advised to continue to wear such a face covering on public transportation if they are reasonably able to do so.

2.3 Mask use is still recommended for health care settings, schools, correctional facilities, shelters, congregate facilities and any other setting where it is required by local, state or federal law.

2.4 For purposes of this Resolution:

a. "Face covering" does not include any mask that incorporates a one-way valve (typically a raised plastic cylinder about the size of a quarter on the front or side of the mask) that is designed to facilitate easy exhaling.
b. A person is "fully vaccinated" 2 weeks after receiving their second dose in a 2-dose series, such as the Pfizer or Moderna vaccines, or 2 weeks after a single-dose vaccine, such as Johnson & Johnson's Janssen vaccine.
c. "Public place" means any place, indoor or outdoor, that is open to the public or a segment of the public and includes, but is not limited to, businesses or other establishments where people assemble or members of the general public may enter; schools; offices; public buildings, highways, and parks.
d. "Public transportation" includes planes, buses, trains, taxicabs and ride sharing, and transportation hubs such as airports and bus stations.

Section 3. *Establishments.*

3.1 Establishments that are open to the public are requested to provide face coverings for any employees who are not fully vaccinated and to encourage their use.

3.2 Nothing in this resolution prevents an establishment, or any private or public entity or service, from setting its own stricter standards for masking and social distancing, or from refusing access to anyone not in compliance.

3.3 Nothing in this resolution excuses any establishment's failure to comply with the Pima County Code, any conditions of licensing or permitting, or any other applicable statute or regulation.

Section 4. *Public Health Advisories.* All persons are recommended to follow updated advice as provided by the Pima County Health Department in its COVID-19 Public Health Advisory Updates.

Section 5. *Applicability.* This Resolution applies throughout Pima County, including within incorporated areas.

Section 6. *Effective date.* This Resolution is effective upon adoption.

PASSED AND ADOPTED this 14th day of May, 2021.

Sharon Bronson
Chair, Board of Supervisors

ATTEST:

Julie Castañeda, Clerk of the Board

APPROVED AS TO FORM:

Jonathan Pinkney, Deputy County Attorney