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OF THE ARKANSAS MEDICAL SOCIETY
VOL. 117 • NO. 5
NOVEMBER 2020

The Importance of Regular Vaccinations During a Pandemic

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THE Journal
OF THE ARKANSAS MEDICAL SOCIETY

VOLUME 117 • NUMBER 5 NOVEMBER 2020

Established 1880. Owned and edited by the Arkansas Medical Society and published under the direction of the Board of Trustees.

Advertising Information: Penny Henderson, (501) 224-8967 or penny@arkmed.org. #10 Corporate Hill Drive, Suite 300, Little Rock, AR 72205.

Postmaster: Send address changes to: The Journal of the Arkansas Medical Society, P.O. Box 55088, Little Rock, AR 72215-5088.

Subscription rate: $30.00 annually for domestic; $40.00, foreign. Single issue $3.00.

The Journal of the Arkansas Medical Society (ISNN 0004-1858) is published monthly by the Arkansas Medical Society:

#10 Corporate Hill Drive, Suite 300,
Little Rock, AR 72205
(501) 224-8967

Printed by The Ovid Bell Press Inc., Fulton, Missouri 65251. Periodicals postage is paid at Little Rock, AR, and at additional mailing offices.

UNITED STATES POSTAL SERVICE®

Statement of Ownership, Management, and Circulation (All Periodicals Publications Except Requester Publications)

1. Publication Title	2. Publication Number	3. Filing Date
The Journal of the Arkansas Medical Society	0283-8600	09/29/2020
4. Issue Frequency	5. Number of Issues Published Annually	6. Annual Subscription Price
Monthly in 2019, Bi-monthly in 2020	12 in 2019, 6 in 2020	$30.00

7. Complete Mailing Address of Known Office of Publication *(Not printer) (Street, city, county, state, and ZIP+4®)*
10 Corporate Hill Dr., Suite 300, Little Rock, AR 72205

Contact Person: Nicole Richards
Telephone *(Include area code)*: 501-224-8967

8. Complete Mailing Address of Headquarters or General Business Office of Publisher *(Not printer)*
10 Corporate Hill Dr., Suite 300, Little Rock, AR 72205

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor *(Do not leave blank)*

Publisher *(Name and complete mailing address)*
Arkansas Medical Society, 10 Corporate Hill Dr., Suite 300, Little Rock, AR 72215

Editor *(Name and complete mailing address)*
Arkansas Medical Society, 10 Corporate Hill Dr., Suite 300, Little Rock, AR 72215

Managing Editor *(Name and complete mailing address)*
Arkansas Medical Society, 10 Corporate Hill Dr., Suite 300, Little Rock, AR 72215

10. Owner *(Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)*

Full Name	Complete Mailing Address
Arkansas Medical Society	PO Box 55088, Little Rock, AR 72215

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box → ☒ None

Full Name	Complete Mailing Address

12. Tax Status *(For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)*
The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
☒ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months *(Publisher must submit explanation of change with this statement)*

13. Publication Title	14. Issue Date for Circulation Data Below
The Journal of the Arkansas Medical Society	November 2020

15. Extent and Nature of Circulation			Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies *(Net press run)*			4499	4451
b. Paid Circulation *(By Mail and Outside the Mail)*	(1)	Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	3329	3387
	(2)	Mailed In-County Paid Subscriptions Stated on PS Form 3541 *(Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)*	0	0
	(3)	Paid Distribution Outside the Mails Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®	2	1
	(4)	Paid Distribution by Other Classes of Mail Through the USPS (e.g., First-Class Mail®)	0	0
c. Total Paid Distribution *[Sum of 15b (1), (2), (3), and (4)]* ▶			3331	3388
d. Free or Nominal Rate Distribution *(By Mail and Outside the Mail)*	(1)	Free or Nominal Rate Outside-County Copies included on PS Form 3541	1114	1013
	(2)	Free or Nominal Rate In-County Copies Included on PS Form 3541	0	0
	(3)	Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g., First-Class Mail)	0	0
	(4)	Free or Nominal Rate Distribution Outside the Mail *(Carriers or other means)*	0	0
e. Total Free or Nominal Rate Distribution *(Sum of 15d (1), (2), (3) and (4))*			1114	1013
f. Total Distribution *(Sum of 15c and 15e)* ▶			4444	4401
g. Copies not Distributed *(See Instructions to Publishers #4 (page #3))* ▶			54	50
h. Total *(Sum of 15f and g)*			4499	4451
i. Percent Paid *(15c divided by 15f times 100)* ▶			75	76

* If you are claiming electronic copies, go to line 16 on page 3. If you are not claiming electronic copies, skip to line 17 on page 3.

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Statement of Ownership, Management, and Circulation (All Periodicals Publications Except Requester Publications)

16. Electronic Copy Circulation	Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Paid Electronic Copies ▶		
b. Total Paid Print Copies (Line 15c) + Paid Electronic Copies (Line 16a) ▶		
c. Total Print Distribution (Line 15f) + Paid Electronic Copies (Line 16a) ▶		
d. Percent Paid (Both Print & Electronic Copies) (16b divided by 16c × 100) ▶		

☐ **I certify that 50% of all my distributed copies (electronic and print) are paid above a nominal price.**

17. Publication of Statement of Ownership

☒ If the publication is a general publication, publication of this statement is required. Will be printed in the November 2020 issue of this publication. ☐ Publication not required.

18. Signature and Title of Editor, Publisher, Business Manager, or Owner

David Wroten, Executive Vice President

Date: 09/29/2020

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BY TOBIAS VANCIL, MD

The Incomplete H & P: The Missing "Family History"

It is a gross understatement to say that the last six months has been challenging for us all. As we toil through a worldwide pandemic, many have made sacrifices – loss of time at home, spending countless hours screening patients in drive-thru settings, increased patient care burden, or even loss of job completely. Some live in fear of personally becoming ill due to exposure while others worry about bringing this illness into the home. It is not uncommon to hear about a provider who has been avoiding certain family members who are at increased risk because of age or comorbid conditions. On the other hand, it seems equally as common to hear about extended families congregating all under one roof to isolate together. Regardless of the situation, we have all had an opportunity to rediscover what family means to us.

I hope that people are taking some time for mindfulness and self-reflection amid the current day-to-day turmoil that extends even beyond the pandemic. (A radio personality was poignant recently in stating: Does anyone remember when the only thing we had to be scared about was COVID-19?). I have heard and read many narratives about this reflective process on podcasts, various news outlets and via online contemporary literature; I have no social media presence, but I suspect I would see more of the same in this arena. Consistently, there is a theme of things taken for granted. Missed summer gatherings with friends, travel to or with family, dinner out with a spouse or even a trip to the park with children. Everything now seems to make us think twice and, as a community, we owe it to each other to take the time to think before we act. Reflection does not have to be melancholy; it can be frighteningly insightful about certain behaviors that we likely will never see again. For instance, how was it ever a good idea to share a bowl of nuts at a bar with dozens of other dirty hands?

One thing that I have taken for granted in my short career is the "family history." The quotations are meant to discern my idea from the heading in an H & P template where histories of familial disease are listed. I am referring to the information obtained from the patient's family that can be very valuable to the diagnostic process. Family members can also be integral in helping a patient with medication adherence, delivering after-care following an illness or surgery or in re-directing the disoriented inpatient. This "loss of family" struck me most while rounding inpatient with a resident team recently and having few, if any, family visitors present due to COVID precautions. Now, I was not surprised by the lack of family at the bedside – I knew this would be the case – but it just did not feel right. I am also familiar with these changes in the ambulatory setting, but it has not had the impact on my practice that it did in the hospital. It is so often that a family member can add insight regarding the history of present illness. Even more obvious is the common scenario of a patient sugarcoating his or her status hoping for an earlier discharge, only to be corrected when family speaks up about concerns or under-presented symptoms. Of even more importance is the presence or lack of family in terms of disposition. Understanding a cognitive or physical functional status baseline almost always needs family input; without this, we can have an altered sense of definitive improvement beyond the data obtained in blood work and clinical imaging.

In a short time, we have seen data presented accepting the hypothesis of increased morbidity and mortality associated with depression related to this isolation while inpatient. I am not suggesting a policy change administratively, as these measures are important to control contagion, only wishing to spread light on an easily overlooked aspect of patient care; it's so easy to not see what isn't there. Really, this is just a reminder to be more diligent in a part of our practice that always has room for improvement: communication. While the phone calls to the family will definitely lengthen a workday, it is what every one of us would expect in return. The look of relief on a patient's face when you offer to reach out to update their loved ones is proof.

BY CASEY L. PENN

The Importance of Regular Vaccinations During a Pandemic

To understate it by a catastrophic mile, nothing has been routine about 2020. Immunizations being no exception, it's especially important right now to encourage your patients to get scheduled vaccinations. This month, we discuss the current immunization situation here in Arkansas to assist you in providing care to patients amid flu season and the continuing pandemic.

Bridging the Immunization Gap Attributed to the Pandemic

The development of a gap in scheduled immunizations during a pandemic year is cause for alarm, and recent data showed that is occurring for Arkansas children. Data presented by the Arkansas Department of Health in July revealed that from January to March 2020, vaccination numbers were consistent with those from the same period last year. However, from March to May 2020, the number of vaccinations for young children went down considerably in number compared to the same period in 2019. Roughly one-third of that number was attributed to privately insured patients and about two-thirds represented children covered by the Vaccines For Children program.

ANNA STRONG

"The health department's latest data* shows that since the COVID-19 outbreak, around 75,000 immunizations have been missed for Arkansas children compared to this time last year," explained Anna Strong, executive director of the Arkansas Chapter of the American Academy of Pediatrics. "We are concerned about this gap, a national trend. The last thing we need during a pandemic is an outbreak of another, preventable disease."

PHOTO COURTESY OF HEATHER HAZZAN, SELF MAGAZINE

Strong focused on the example of measles and the MMR vaccine (Measles, Mumps, Rubella). "We know that measles is approximately six times as contagious as coronavirus according to the last numbers I've seen," she said. "It's highly concerning that there was a huge drop in the MMR vaccine during the scheduled periods of between 12-15 months and between 4-6 years of age."

Pediatrician Laura Williams, MD, practices at PrimeCare North Little Rock and serves as medical director for the nonprofit vaccination awareness organization Immunize Arkansas. She has seen the reduction in vaccinations firsthand and is concerned. While her clinic has tried to continue aggressive immunizations as usual, she has seen fewer patients coming for vaccinations, she believes due to the "patient fear of coming to doctor (thinking we were closed, you could get sick, etc.), an increase in vaccine hesitancy brought about by distrust of the medical establishment," and parents of children not currently going to in-person school feeling that the usual vaccine rules don't apply to them.

"If we can get the patients in the office, we are generally successful in giving immunizations, especially to the under-two-year-old group," said Dr. Williams. "We have tried calling, reminders when children come in for illness or COVID testing, and advocating on social media."

Dr. Williams noted that, on top of the work involved in getting patients into the clinic, giving vaccines is expensive and poorly reimbursed. "In this era of severe business constraint to pediatricians," she explained, "it becomes a fine line between appropriate, effective medical care and staying afloat. I think immunization is part of the 'pediatric religion' as it were; however, most of us feel hamstrung in trying to deliver. I am especially worried about the upcoming influenza season. Many people do not think of influenza as a 'big deal' and are more than usually concerned about unfounded side effects. The overall suspicion of big pharma, of governmental medical oversight, and general fatigue over the pandemic all seem to lead to not following through with preventative health care."

Reimbursement worries aside, Dr. Williams has remained resolute during the extra stress of the pandemic. "We are here for the health and well-being of children and that has to be our focus," she said. "The service we provide is essential to the future of society. In general, government has not been very supportive of pediatric efforts, to include immunizations. Most of my colleagues feel that we are just treading water and are being asked to do more with a lot less. We will persevere … the kids are worth everything."

To help bridge the pandemic's vaccination gap and the financial burden on physicians who provide vaccinations to Arkansas children, ARAAP and other Arkansas stakeholder groups

*as of 9/1/20

PHOTO COURTESY OF HEATHER HAZZAN, SELF MAGAZINE

recently worked together to procure funding to help. "Specifically, ARAAP proposed to the Arkansas Department of Human Services that the state allocate funding from the Federal CARES Act to reimburse qualifying physicians for otherwise non-reimbursable expenses related to immunizing children," explained Strong. "We had the support of the Arkansas Medical Society, Arkansas Academy of Family Physicians, and other important partners in delivering vaccines to kids across the state.

"I have not heard of another state tapping into their CARES Act funding in this way. In the end, we developed a program that allowed primary care practices who were participants in the Medicaid Primary Care Case Management and the Vaccines For Children programs to apply for funding of up to $30 per Medicaid-attributed child in reimbursement for activities to increase and enhance compliance."

In all, the group procured $8.7 million, providing an efficient and effective path for children to get missed vaccines from trusted primary care physicians. Though the incentive has ended, it significantly helped many Arkansas physicians. "We estimated that for a pediatric practice of about seven physicians, it would be about $130,000 to pay for enhanced outreach and care coordination," said Strong. "This effort was one more way for us to support and emphasize the importance of immunizations, particularly within the context of a well-child visit in a medical home."

Long-Awaited Medicaid Reimbursement Increase

"Another positive that happened this year had to do with reduced losses for our immunization program," said ADH Senior Medical Advisor and ARAAP President Gary Wheeler, MD. Dr. Wheeler has long preached the inadequacy of Medicaid's immunization reimbursement – and how far it was from covering costs for practices. "Most practices have been losing money every time they give a vaccine covered by Medicaid. The actual cost for administering a vaccine is roughly $25, but Medicaid has been paying only about a third of that. We had petitioned to take that number up to the limit of what Medicaid allows, which is about $20 per vaccine."

Recently, Medicaid increased that reimbursement – that's welcome news for Arkansas physicians taking Medicaid. "We didn't get it all the way up, but we got much closer," Dr. Wheeler explained. "Previously, reimbursement was $9.56 for pediatric vaccines administered from the Vaccines For Children program. Starting July 1, flu vaccine administration increased by 62% to $15.45 and other Medicaid-payable vaccines increased by 37% to $13.14."

More Reimbursement Help Needed on the Adult Side

Scheduled vaccines for young children aren't the only concern raised by the pandemic. "Comparing this year to last year, we did see a drop in adult rates, too," mentioned Dr. Wheeler. "Adults may not feel that they need vaccinations as much as children, but there are few adults that don't have contact with children. Children are very good at spreading infection, so adults need to get their vaccines to protect themselves."

For Arkansas adults covered by Medicaid and for the physicians trying to serve them, this is easier said than done. Although slight improvements have been made in Medicaid reimbursements related to adult vaccines, much more needs to be done, according to John Vinson, Pharm.D., and Chief Executive Officer for the Arkansas Pharmacists Association. "The reality is that physicians and pharmacists serving Medicaid patients have largely had to stop providing most adult vaccines, including influenza vaccine, due to lack of adequate compensation," said Vinson, who has been a spokesman for change on this issue.

With support from AMS and other groups, Vinson submitted a letter to Gov. Hutchinson in 2018 addressing shortfalls in Medicaid Immunization approved fees and reimbursements. His letter commended past reforms improving immunization coverage for Arkansas Works and Employee Benefits Division plans and asked for similar reforms to Medicaid. Specifically, he asked for an increase in the Medicaid immunization administration fee for children and adults, an update to the Medicaid ingredient cost reimbursement for patients age 19 and over for vaccine product, and a required policy for Arkansas Medicaid coverage of all Centers for Disease Control Advisory Committee on Immunization Practices recommended vaccines and schedules for children and adults.

GARY WHEELER, MD

Some good changes came in response, explained Vinson. As Wheeler aforementioned, the immunization administration fee for adults, just like for children, increased. This was significant since previously, adult vaccine administration fees and administration-specific codes were not covered at all. "Before July, providers of adult vaccine could only get reimbursed from Medicaid for the cost of the vaccine product," Vinson said, "and that often did not cover actual cost. This new policy will help with influenza vaccination access for patients but not so much with *other* adult vaccines.

>>CONTINUED ON PAGE 103.

DRIVE-THROUGH TESTING. PHOTO COURTESY OF ADH.

PHOTO COURTESY OF HEATHER HAZZAN, SELF MAGAZINE

Elaborating on what's still missing, Vinson added, "These administration fee policy changes with Arkansas Medicaid are welcome, but more policy changes are needed if we seek to further strengthen our states' immunization infrastructure in response to the global pandemic" "So far, the state has not addressed reimbursement on the ingredient side. We asked for the CPT billing codes for adult vaccines to be reviewed and adjusted consistent with adequate compensation – by reviewing other state Medicaid programs, Medicare, private insurance, and established pricing standards like Average Wholesale Price and Wholesale Acquisition Cost.

"The most egregious example of the broken policy is pneumococcal vaccine, 23 valent, with CPT code 90732. 90732 reimburses $12.34 and likely has not been reviewed or updated since the 1980s when the vaccine first came to market. Today, the vaccine average cost for providers to purchase is around $100 per dose. For comparison, state Medicaid programs like Florida and Mississippi reimburse between $105 and $130. In Arkansas Medicaid, the total reimbursement is $25.48, compared to more than $135 total in Medicare B in Arkansas. This out-of-date policy leads to lack of access for these vaccines for this vulnerable patient population. Updating the policy would result in less death and permanent disability (from neurological and other organ damage from this horrific illness) as well as lower costs to tax payers from vaccine-preventable disease complications.

"Finally, Arkansas Medicaid has not yet addressed the request to provide adult coverage for all CDC ACIP recommended vaccines, contrasting with their appropriate policy in pediatrics where the Vaccines For Children program does purchase and cover all CDC ACIP recommended vaccines. If they were to grant our requests in these remaining areas, it would help state immunization rates rise and result in Medicaid cost savings by preventing spending on treatment related to medical complications of vaccine-preventable illnesses."

Flu Season is Here, COVID-19 Notwithstanding

It's safe to say it's going to be a different flu season this year. "It complicates the clinical picture," said ADH Medical Director for Immunizations and Outbreak Response Jennifer Dillaha, MD. "With a lot of flu circulating, you have more people with respiratory symptoms, so you have to distinguish between flu and COVID. Also, we have many hospitalizations related to the flu. Last year (fall 2019-spring 2020), we had 105 flu deaths and close to 1,300 hospital admissions. Can you imagine having those hospitalizations along with those we've had with COVID-19? It could very much stress our system.

"We've had 4,182 hospitalizations related to COVID since early March. That's why flu vaccines are so important. The more people we can keep out of the hospital with flu, the better. This comes down to individual patient care. We know that the people who do most poorly with COVID-19 are the people who do most poorly with influenza. It's the elderly and the people with chronic health conditions. Fortunately, children tend to do better with COVID-19 than they do with flu. We have children that die every year from the flu. You can imagine what it might do to someone who got both. Fortunately, with flu, we have treatment and a vaccine."

JENNIFER DILLAHA, MD, ADH MEDICAL DIRECTOR FOR IMMUNIZATIONS AND OUTBREAK RESPONSE

Alongside the impediment of distinguishing flu from COVID-19 is the realization that flu immunization clinics will be fewer and smaller this year. ADH has offered drive-through clinics since late September, but they're nothing like those of past years. "Before, we had mass clinics where everyone could line up and get their flu shot," she added. "This year, you can't line up, so many local health units are incorporating flu with drive-up COVID testing. So, you could get a COVID test and a flu shot, or you could get just a flu shot or just a COVID test."

With this in mind, Dr. Dillaha encourages clinics and pharmacies – if they haven't done so already – to develop their own drive-up or drive-by system for offering vaccinations.

Another thing to note this year is that nasal flu vaccines are *not* recommended. Dr. Wheeler explained, "Nasal vaccines have always been an option for adults and children. We're discouraging that because of the risk of somebody sneezing and such with COVID-19. Most people are ordering the injectable vaccine instead.

"We know that the things you do to keep from getting COVID-19 keep you from getting the flu or the common cold. So, we're hopeful that we'll see a drop in some of those pathogens in terms of frequency IF – capital I, capital F – people

PHOTO COURTESY OF HEATHER HAZZAN, SELF MAGAZINE

will do what they're supposed to do surrounding COVID (masking, frequent hand hygiene, social distance, that kind of thing). We'll see if my hypothesis is correct, but I hope that all this other work will lead to a dramatic drop in some of these other infections and the complications that people have from them such as secondary bacterial pneumonia, flare-ups of asthma, etc."

Expectations Surrounding COVID-19 Vaccine

Finally, our experts comment on another big question this season: What can physicians expect regarding a COVID-19 vaccine this fall?

"The thought is that COVID-19 vaccination programs will begin soon after the flu vaccine season," said Dr. Wheeler. "Usually, we have most flu vaccines administered by first of November. This year, I don't know when we'll finish flu, nor do we know when we'll have access to COVID-19 vaccination. There is a national program to deliver the vaccines around the country. There are logistical and operational things that will engage multiple agencies and the federal government. It's likely to go to multiple sites and be phased in. There will be distribution priorities … health workers and first responders will likely get the first available vaccines. As you go down that list, the discussion will begin. Who is next in line? Do we go to the high-risk people who have high exposure? To those who not only have high-risk but also have likelihood of responding well to vaccines? Older people typically don't respond to vaccines very well and there may be some pressure for older populations to go lower down the list, but nursing home residents are likely to be high on the list because of their high mortality rates. Probably the most important people will be the staff that work in nursing homes – they're typically younger, have strong immune responses, and are typically the ones who bring the virus into nursing homes.

"As you can see, there will be some controversial discussions about how the population gets immunized.

"Private offices may not be getting COVID-19 vaccine in their hands right away. For right now, there have been no clinical trials for these vaccines for children. In the normal course of events, we would test adults first and see if they're safe. Right now, children are unlikely to be in the first round. That's why [many believe] people like teachers ought to be in the priority group."

Focusing on What Is Effective

Going into flu season, and throughout the continuing COVID-19 pandemic, physicians need to remain focused on advocating for regular immunizations. "I think amid all the things that are going on, we can forget the most important thing, which is that immunizations continue to be the number one most effective prevention tool that we have," said Dr. Wheeler. "So, things like the whooping cough, the pneumococcal vaccine, the zoster vaccine – these are all life-saving vaccines that are part of our regular care of patients. It's important that we continue to do that work. That means using your EMR and other tools to make sure your patients are up-to-date."

The pandemic has caused most physicians to adopt new and innovative ways to deliver care. "We need to apply that same principle to providing immunizations," said AMS Executive Vice President David Wroten. He went on to add, "Throughout this challenging period, the AMS has served as a resource and lifeline to our state's medical practices, particularly in the area of telemedicine and of course, PPE. But make no mistake, our doctors and nurses have been the shining stars, the real heroes. We recognize that physicians are overwhelmed; they are exhausted and some even depressed. I hope they know, without any doubt, that the Arkansas Medical Society, its physician leaders and staff, appreciates their sacrifices and dedication to their patients. We will continue helping in any way we can."

To stay abreast of updates and research related to COVID and its impact on immunizations, physicians may want to attend the 2020 Immunization Summit, to be presented virtually this fall by Immunize Arkansas, on November 13. See sidebar, next page, for more information.

Additional Reading

Coronavirus Vaccine Tracker
https://www.nytimes.com/interactive/2020/science/coronavirus-vaccine-tracker.html

BY CASEY L. PENN

2020 Immunization Summit: November 13, 2020

Hosted by Immunize Arkansas, Virtual Summit to Include Updates, Continuing Education

To stay abreast of updates and research related to COVID and its impact on immunizations, physicians may want to attend the 2020 Immunization Summit, presented virtually this fall by Immunize Arkansas, on November 13.

HEATHER MERCER

Heather Mercer is executive director of Immunize Arkansas, a nonprofit dedicated to improving vaccination rates for all Arkansans through education, advocacy, and statewide partnerships. Not a government agency or pharmaceutical company, the organization supports ADH and other stakeholders in raising awareness and removing fears about vaccines through two summits annually (HPV in the spring and a larger, comprehensive summit in the fall) and continuing education for physicians, nurses and pharmacists.

"The focus of this year's [fall] summit is COVID and the impact on immunizations," said Mercer. "People may be tired of talking about COVID, but it has had a tremendous influence on physicians and their practices and their patients, and it's not going to be over for a while."

ADH Medical Director for Immunizations and Outbreak Response Jennifer Dillaha, MD, will open the Summit with "The State of the State (COVID Update and Immunization Rates)." Dr. Dillaha noted, "Last year, when Dr. Nate Smith gave a similar presentation, Arkansas had moved from 50th in all the states in completion of the required vaccination series for young children (in 2013) to a rank of 16th. That's an amazing rise, so, I'm interested to see if we improved the following year, but we're waiting to get 2019 data from the National Immunization Survey. I'm not sure if it will be delayed due to the pandemic. I thought surely we would continue to move up, but now in 2020, everything is a different story."

AMS President Chad Rodgers, MD, is scheduled to present "Encouraging and Maintaining Childhood Immunizations and Well-child Care During COVID-19." He shared a few thoughts with *The Journal* from his perspective as a pediatrician and chief medical officer for Arkansas Foundation for Medical Care. "We know a lot about how vaccines are made and how to make them safely. That knowledge and other advancements in medicine are helping us make a new vaccine in a safe, effective way," said Dr. Rodgers.

Agenda

8:00am – 9:00am- The State of the State (COVID Update and Immunization Rates) – Jennifer Dillaha, MD, State Epidemiologist and Medical Director of Immunizations, Arkansas Department of Health

9:00am – 9:45am - COVID Vaccines in Development and the Process– Jose Romero, MD, Secretary of Health, Arkansas Department of Health; Chair - Advisory Committee on Immunization Practices

9:45am – 10:00am Break

10:00am – 11:00am - How to Promote a Vaccine that Doesn't Exist – Erica DeWald, Director of Advocacy, Vaccinate Your Family; Karen Ernst, Director, Voices for Vaccines

11:00am – 12:00pm Encouraging and Maintaining Childhood Immunizations and Well-Child Care During COVID-19 – Chad Rodgers, MD, Pediatrician, President – Arkansas Medical Society

12:00pm – 1:00pm Lunch

1:00pm – 2:00pm - Shared Clinical Decision Making – TBD

2:00pm – 3:00pm How Immunizations are Influenced through Social Media – Joe Smyser, PhD, CEO, The Public Goods Project

3:00pm – 3:15pm - Evaluation

Other speakers and topics include "How Immunizations are Influenced through Social Media," from speaker Joe Smyser, PhD, CEO, of The Public Goods Project, and "COVID Vaccines in Development and the Process," presented by ADH Secretary of Health and Chair of Advisory Committee on Immunization Practices Jose Romero, MD.

"It will be interesting to see what Dr. Romero will have to share," anticipated Mercer. "He should have an informative update about current vaccines in development and reassurance that they will be safe. There's so much misinformation about the vaccines in clinical trials. We must educate now on the process so that when it's available, people will get it. We already have a hard time getting people to get a flu vaccine. One of the things that physicians can do to help with that is to emphasize that it's safe for children to come into their clinics."

Concerning social media, she added, "So much of social media surrounding immunizations is negative. Arkansas hasn't been hugely impacted by the anti-vaccine movement, but the problem is growing in that direction. COVID has put a magnifying glass on vaccines. We've seen what not having a vaccine can do – for this one disease or virus. We certainly don't want to get back to the point where we could have another pandemic on our hands, especially for something that is preventable."

The final registration deadline for the event is November 9, 2020. For more on registration and a full schedule of speakers and CE, visit https://www.immunizear.org/2020-virtual-immunization-summit.

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A CLOSER LOOK AT QUALITY

Physician's Role in COVID-19 Contact Tracing

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The COVID-19 pandemic presents many challenges to the public health and medical community. Current systems are expanding to meet the need of a rapidly evolving emergency infectious disease situation. Pandemic influenza plans have informed response and mitigation efforts while well-established infectious disease measures were implemented on a large population-wide scale. Tenets of an infectious disease public health response include testing, isolation of infected individuals (index cases) and quarantine of exposures individuals (direct contacts).

One critical public health measure is the rapid identification of positive index cases through testing. Once an index case is identified, investigation begins to collect demographics, household information, workplace and other exposures, travel history, contacts with the index case, and promptly placing the index case in isolation. Identifying and informing close contacts to the index case and quarantine efforts along with close monitoring for symptoms is the next priority for stopping the spread of COVID-19.

According to the Association of State and Territorial Health Officials (ASTHO), contact tracing is the process of identifying, assessing, and managing people, or "contacts," who have been exposed to a disease to prevent additional transmission.[1] The four main objectives for COVID-19 contact tracing are identifying and notifying contacts, determining extent of exposure, establishing risk and providing quarantine guidance. All objectives require the establishment and use of specific criteria to define cases, contacts, and exposures. The setting of epidemiological definitions to standardize criteria is important and should always include the three classical epidemiological variables of person, place, and time. For example, based on current knowledge, the Centers for Disease Control and Prevention (CDC) defines a close contact for COVID-19 as someone who was within 6 feet of an infected person for 15 minutes or longer starting from 48 hours before illness onset until the time the patient is isolated (i.e. during the case's infectious period).[2]

Contact tracing has a long history in response to infectious disease outbreaks. Recent efforts worldwide for contact tracing include mobile device app solutions for COVID-19 and text messaging solutions for rapid identification of index cases and potential hot spots; however, privacy concerns have limited the use of several systems within the United States.[3]

The Arkansas Department of Health (ADH) has contracted with two vendors, including Arkansas Foundation for Medical Care (AFMC) to conduct case investigation and contact tracing for the state. The case investigators make initial contact with index cases and the contact tracers collect essential contact information (direct contacts with dates of exposure) which is utilized to reach individuals who may have been exposed to COVID-19. As efforts evolve and progress, the amount of time from case investigation to reaching of direct contacts has reduced through the streamlining of case investigation and contact tracing processes. There are several factors that contribute to and can be used to measure effectiveness of the contact tracing process, including the amount of time to reach an

index case and their contacts, ability to effectively communicate the need for contacts to quarantine, and willingness of a population to follow quarantine recommendations. Building rapport and trust is a critical step for the contact tracing process which may influence an individual's willingness to comply with directions.[1]

As more point of care testing is made available and health care providers in private clinic settings advise patients with COVID-19 symptoms, it is imperative that health care providers statewide also prepare their patients for calls related to case investigation and contact tracing efforts. The clinical visit, either through telemedicine or face-to-face, is an initial point of contact with COVID-19 cases which provides physicians and other providers an unique opportunity to educate patients regarding the disease and augment the efforts of public health personnel.

The following are steps that can be implemented in medical practices to create awareness and help with contact tracing efforts:[4]

- Inform each patient who tests positive for COVID-19 that they should expect an initial call from a case investigator on behalf of the ADH.
- Stress the importance of self-isolation to prevent spreading and transmitting the disease to family and friends.
- Encourage patients to talk directly to the people they have been in contact with while they were contagious and urge them to ask those contacts, if possible, to quarantine.
- Ask patients to make a list of contacts beginning two days prior to symptom onset or the specimen collection date of positive a COVID-19 test (if the patient is asymptomatic). This will enable them to be prepared to share that information when taking a call from the contact tracer.
- Make them aware of what phone numbers to expect calls from.
  - Arkansas Department of Health (800) 803-7847
  - AFMC (833) 283-2019
  - General Dynamics Information Technology (877) 272-6819

Educate patients that there are scams and to be aware that anyone calling on behalf of the ADH will not be asking for credit card information, money, or social security numbers. ▲

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Contact Tracing Organizations

Arkansas Department of Health
(800) 803-7847
AFMC
833) 283-2019
General Dynamics Information Technology
(877) 272-6819

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SCIENTIFIC ARTICLE

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Characteristics of E-Cigarette, or Vaping, Product Use-Associated Lung Injury (EVALI) Patients

Disclaimer: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Abstract

During August–December 2019, 23 persons who received a diagnosis of e-cigarette, or vaping, product use-associated lung injury (EVALI) were reported to the Arkansas Department of Health (ADH); none died. Among Arkansas EVALI patients, most were aged <25 years and white; two-thirds were male. Approximately half of Arkansas EVALI patients were admitted to intensive care units. Among 18 patients who were interviewed, 61% reported using both nicotine and tetrahydrocannabinol in an e-cigarette, or vaping, device during the 90 days preceding illness onset. Clinicians should remain vigilant for EVALI and continue to report cases to ADH.

Introduction

During July 2019 in Wisconsin and Illinois, the first cluster of persons with severe lung injury that was eventually termed e-cigarette, or vaping, product use-associated lung injury (EVALI) was identified. Common symptoms reported by patients were shortness of breath, nausea, and subjective fever.[1] Characteristic clinical findings included hypoxemia, neutrophilia, lack of evidence of bilateral pulmonary infiltrates on chest radiographs or chest computed tomography (CT) images, and an absence of infectious disease etiology.[1] Additional states subsequently reported patients with similar injuries, and on August 16, 2019, the Arkansas Department of Health (ADH) identified its first EVALI patient.

Since the outbreak started, state health departments, CDC, and the U.S. Food and Drug Administration have worked collaboratively to more fully understand causes, prevention, clinical features, and management of EVALI. This report describes the outbreak and response in Arkansas to raise clinician awareness, optimize diagnosis and patient care, and promote public health reporting.

Methods

On August 30, 2019, ADH re-released CDC's Health Advisory "Severe Pulmonary Disease Associated with Using E-Cigarette Products" to health care providers across the state using the voluntary ADH Health Alert Network (HAN) system.[2,3] In this HAN notification, clinicians were asked to report to ADH any patient with severe pulmonary disease of unclear etiology and a history of e-cigarette, or vaping, product (EVP) use during the past 90 days.

All cases summarized in this report have been classified according to CDC's Lung Injury Surveillance Primary Case Definition released on September 18, 2019.[4] By definition, "confirmed" EVALI cases were patients who reported use of an EVP ≤90 days before symptom onset, had pulmonary infiltrates on chest radiographs or ground glass opacities on chest CT scans, had negative respiratory viral panel, influenza (if local epidemiology supported influenza testing), and all other clinically indicated respiratory infectious disease tests, and no alternative plausible diagnoses for pulmonary illness. "Probable" EVALI cases were those who met all aspects of the "confirmed" definition, except the patient did not have a full infectious disease workup, or a respiratory pathogen was identified but the clinical team believed the infectious agent was not the sole cause of illness.

For all reported cases, patient medical records were requested. Records were received by fax or mail and data regarding demographics, symptoms, clinical course, chest imaging, and infectious disease testing were abstracted and entered into a database (Research Electronic Data Capture [RedCap]; version 8.8.0). When patients were available, they were interviewed by telephone about their history of EVP use. Data entered into RedCap were downloaded and descriptive statistics were computed using Microsoft Excel for Office 365 (version 2002).

Results

In total, 23 persons with EVALI were reported to ADH (eight confirmed and 15 probable cases). Arkansas EVALI patients reported illness onset during August–December 2019; about half (12, 52.2%) had onset of illness in September (Figure 1).

Table 1 summarizes demographic information; median age at injury onset was 21 years (range: 17–54 years), 78.2% of cases were among

Table 1. Demographic Characteristics of Arkansas EVALI Patients (N = 23)

	No. (%)
Age (yrs)	
<18	2 (8.7)
18–24	13 (56.5)
25–34	5 (21.7)
35–44	2 (8.7)
45–54	1 (4.3)
Sex	
Male	15 (65.2)
Female	8 (34.8)
Race/Ethnicity	
Non-Hispanic White	18 (78.3)
Hispanic, Any Race	4 (17.4)
Non-Hispanic Black	1 (4.3)
ADH Public Health Region of Residence[a]	
Northwest	13 (56.5)
Northeast	2 (8.7)
Central	8 (34.8)
Southwest	0 (0)
Southeast	0 (0)

[a] Counties belonging to ADH Public Health Regions can be found at www.healthy.arkansas.gov/health-units

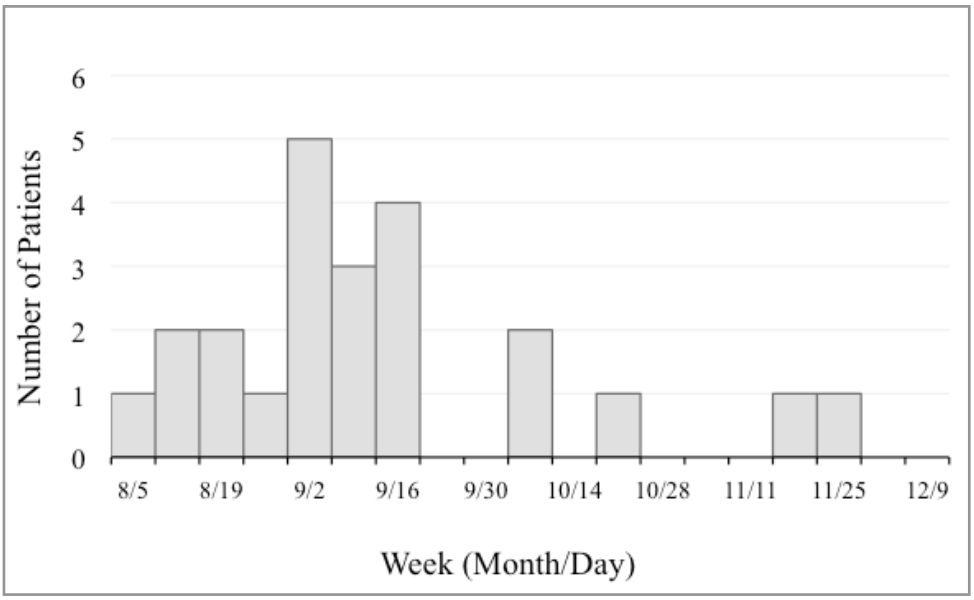

FIGURE 1. WEEK OF SYMPTOM ONSET FOR EVALI PATIENTS (N = 23) REPORTED TO THE ARKANSAS DEPARTMENT OF HEALTH — ARKANSAS, AUGUST 4, 2019–DECEMBER 8, 2019

individuals aged 18–34 years old, and 15 (65.2%) were male. Injuries were reported throughout the state, although approximately half of patients resided in ADH's Northwest Public Health Region (56.5%). Rural Baxter County in the Northwest Region reported seven cases accounting for 30.4% of all cases in the state.

All 23 patients required hospitalization, with a median hospital stay of six days (range: two–14 days); no patient died. Twelve (52.2%) patients visited a health care provider for EVALI-related symptoms before the visit for which they were ultimately admitted for hospitalization. Of these 12 patients, four first sought treatment at an urgent care center (33.3%), four (33.3%) at a hospital emergency department (ED), and four (33.3%) at their primary care provider. Of 11 patients who were admitted to the hospital on the same day they first sought treatment for EVALI-related symptoms, one (9.1%) presented to an urgent care provider before ED referral, and 10 (90.9%) sought care directly from a hospital ED.

Clinical characteristics, diagnostic testing, and therapeutic procedures for these 23 patients are summarized in Table 2. Influenza testing was performed for 18 (78.3%) patients; all these tests were negative. Ten patients (43.5%) received a respiratory viral panel, and nine patients (39.1%) had negative results for all pathogens tested. Adenovirus was detected in one patient, but the patient's clinical team believed that this infection was not the sole cause of illness. Twenty-two (95.7%) persons with EVALI received chest radiographs during their illness. Of these, 20 (90.9%) had bilateral pulmonary infiltrates. Of 23 EVALI patients, 19 (82.6%) had a chest CT scan at some point during their hospitalization, all of whom had bilateral ground-glass opacities. Eighteen (78.3%) patients received both chest radiographs and one or more CT scans.

Eighteen of 23 (78.3%) patients were available for interviews regarding EVP use or had complete information in their medical records on substances used in e-cigarette, or vaping, devices. Of these 18 patients, 14 (77.8%) had used nicotine, 15 (83.3%) had used tetrahydrocannabinol (THC), and two (11.1%) had used cannabinoid (CBD) in an e-cigarette, or vaping, device in the 90 days preceding illness onset. Two (11.1%) of these 18 patients reported exclusively using nicotine-containing products, three (16.7%) exclusively THC-containing products, and one (5.6%) CBD-containing products only. Eleven patients (61.1%) used both THC and nicotine-containing products, and one (5.6%) patient used nicotine, THC, and CBD-containing products.

Discussion

According to CDC, 2,807 hospitalized EVALI cases have been reported nationwide through February 2020, and 68 deaths have been confirmed.[5] The outbreak course in Arkansas followed the national outbreak, where EVALI cases peaked in September and then steadily decreased thereafter.[6] However, despite significant progress in controlling the outbreak, some cases continue to occur.[7] Therefore, clinicians should remain vigilant for this diagnosis in patients with an EVP use history and who also have compatible respiratory, gastrointestinal, or constitutional symptoms. Clinical guidance and tools for health care providers can be found on CDC's Lung Injury Outbreak webpage, including an algorithm for EVALI patient management and a discharge readiness checklist.[8]

Nationwide, most EVALI patients reported use of THC-containing EVP's obtained through informal sources such as family, friends, and online or in-person dealers.[8] In toxicologic anal-

>>CONTINUED ON PAGE 112.

Table 2. Common Clinical Characteristics and Therapeutic Procedures of Arkansas EVALI Patients (N = 23)

	No. (%)
Initial Signs and Symptomsa	
Shortness of breath	22 (95.7)
Cough	22 (95.7)
Fever or chills[b]	20 (87.0)
Hypoxemia[c]	19 (82.6)
Nausea or vomiting	18 (78.3)
Diarrhea	9 (39.1)
ICU Admission and Therapeutic Procedures	
ICU admission	11 (47.8)
Mechanical ventilation	8 (34.8)
BiPAP or CPAP	7 (30.4)

Abbreviations: ICU = intensive care unit, BiPAP = bilevel positive airway pressure, CPAP = continuous positive airway pressure

[a] Patients could report more than one symptom

[b] Subjective or objective (temperature ≥100.4°F)

[c] Oxygen saturation ≤95% while breathing room air

yses, vitamin E acetate was found in 94% of 51 EVALI-patient bronchoalveolar lavage (BAL) samples and in THC-containing e-cigarette, or vaping, products from 81% of patients.[9,10] Vitamin E acetate was not found in BAL specimens from people without EVALI.[9] Further implicating vitamin E acetate as a toxicant causing EVALI, media sources have reported vitamin E acetate being sold on the internet beginning in late 2018 or early 2019 as a diluent-thickener for illicit THC-containing e-cigarette, or vaping, product liquids.[11] Additionally, analyses of THC-containing products seized by law enforcement in Minnesota revealed presence of vitamin E acetate in products confiscated during 2019, but not in products confiscated in 2018.[12] Although vitamin E acetate is strongly associated with EVALI, current evidence is not sufficient to rule out the contribution of other toxicants or chemicals of concern, including chemicals in either THC-containing or nicotine-containing products, in some of the reported EVALI cases.

Consistent with data from Illinois and Wisconsin, approximately 17% of Arkansas EVALI patients denied THC product use in an e-cigarette, or vaping, device during the 90 days preceding illness onset.[1] Therefore, EVALI should still be considered as a possible diagnosis among patients with compatible clinical symptoms who deny using THC-containing EVPs. Clinicians should continue to advise against the use of nicotine- or THC-containing EVPs by youths, young adults, or pregnant women and advocate avoidance of THC-containing EVPs for all persons, particularly those acquired from informal sources.

ADH will continue to investigate cases of EVALI and asks that providers report suspected cases to the Outbreak Response Section at 501-537-8969. To receive timely, updated information on outbreak response activities, clinicians are encouraged to enroll in the voluntary Health Alert Network on the ADH webpage (https://hanregistration.adh.arkansas.gov/).

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CASE STUDY

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COVID-19 Comorbid Conditions Associated with Severe Outcomes in Arkansas

Abstract

As of August 24, 2020, there were 57,635 confirmed cases of COVID-19 in Arkansas. In this retrospective case cohort study, we assess the preexisting conditions associated with poor outcomes (hospitalization, ICU admission, intubation, and death) in Arkansans infected with COVID-19 using historical health care administrative data contained in the Arkansas All-Payer Claims Database. Our findings of elevated risk for severe outcomes among COVID-19 patients with a history of kidney failure, immunocompromised conditions, serious cardiovascular diseases, and diabetes mellitus are consistent with those documented by the CDC. In addition, we found an increased risk of death among COVID-19 patients with dementia.

Background

The ongoing coronavirus disease pandemic of 2019 (COVID-19), caused by the 2019 novel coronavirus (SARS-CoV-2), is one of the greatest public health challenges in the past century. As of August 24, 2020, there were 57,635 confirmed cases of COVID-19 in Arkansas, including an estimated 4,109 hospitalizations, 1,489 intensive care unit (ICU) admissions, 540 patient intubations, and 733 deaths.

On July 17, 2020, the Center for Disease Control and Prevention (CDC) published a list of underlying health conditions that may contribute to increased risk of COVID-19 case severity. Much of the research cited by the CDC was based on outcomes observed in Wuhan, China. In this confirmatory study, we identified health conditions that are prognostic for severe outcomes among Arkansas COVID-19 patients requiring hospitalization, ICU admission, intubation, or that result in death. Data from the Arkansas Department of Health (ADH) registry of Arkansans who have been tested for COVID-19 was linked with historical health care administrative data contained in the Arkansas All-Payer Claims Database (APCD).

The CDC has reported that there is strong evidence that serious heart conditions (e.g., heart failure, coronary artery disease, or cardiomyopathies), cancer, chronic kidney disease, chronic obstructive pulmonary disease (COPD), obesity, sickle cell disease, solid organ transplantation, and type 2 diabetes mellitus increase the risk of more deleterious outcomes among COVID-19 patients.[1] There is mixed evidence that asthma, cerebrovascular disease, hypertension, pregnancy, smoking, and use of corticosteroids or other immunosuppressive medications are associated with severe outcomes. The Arkansas population is burdened with a high prevalence of many of these underlying health conditions.

Analysis from the most recent 2018 Behavioral Risk Factor Surveillance System (BRFSS) identifies that Arkansas adults have among the highest rates of type 2 diabetes mellitus (13.9%), kidney disease (3.7%), hypertension (38.5%), COPD (9.8%), and self-reported fair or poor health (24.7%) in the U.S. Also, U.S. Cancer Statistics reports that Arkansas has among the highest prevalence rates of cancer (471.4 per 100,000).[2] Estimating the elevated risk of COVID-19 acuity due to these conditions can help shape state policies and communication to this vulnerable population.

A focal aim of this study was to assess and document conditions associated with poor outcomes in Arkansans infected with COVID-19. In addition, we have demonstrated a real-time application of an APCD to conduct a retrospective cohort study on COVID-19 patients.

Method

We conducted a retrospective case cohort study on Arkansans who tested positive for COVID-19 by linking two databases — the ADH COVID-19 registry and the APCD contained within the Arkansas Healthcare Transparency Initiative (AHTI).

The ADH COVID-19 registry contains demographic and geographic characteristics (e.g., race, gender, county of residence) of COVID-19 patients in a secure database maintained at ADH. In 2015, the Arkansas General Assembly established the AHTI to address the state's data needs to improve health and support research. This initiative requires health care insurers — including Medicaid, Medicare, and commercial insurers throughout the state — to submit medical, pharmacy, and dental claims inclusive of diagnostic information from Arkansans to the APCD. This large-scale database is securely administered by the Arkansas Center for Health Improvement (ACHI) and governed by the Arkansas Insurance Department (AID). Conditions that individuals were diagnosed with prior to the coronavirus infection were identified using the APCD, which contains claims starting in 2013 for approximately 80% of Arkansans.

In order to protect any personally identifiable information (PII) within the data, the APCD uses an anonymous and unique 44-character identifier — called a HASH ID — that incorporates a person's last name and date of birth. This HASH ID is further combined with gender to improve data linkage accuracy. A HASH ID was constructed for individuals within the ADH COVID-19 registry and was linked to APCD enrollment, medical, and pharmaceutical claims records from 2013 through June 2019. Medicare data were only available through December 2017.

To ensure that the study sample was limited to individuals with sufficient clinical history in the APCD to observe diagnoses related to chronic risk conditions, we applied a set of inclusion criteria that included: (1) COVID-19 positive individuals in ADH COVID-19 database with valid age and gender information as of August

Table 1: Demographic characteristics of COVID-19 positive patients

Characteristics	Outcomes				
	Positive Test N	Hospitalization N (%)	ICU Admission N (%)	Intubation N (%)	Death N (%)
Gender					
Male	12,136	1214 (10)	494 (4.1)	180 (1.5)	265 (2.2)
Female	16,749	1457 (8.7)	468 (2.8)	159 (0.9)	282 (1.7)
Age					
<20	5,847	56 (1)	--	--	--
20 to 44	11,442	452 (4)	121 (1.1)	28 (0.2)	14 (0.1)
45 to 64	6,292	775 (12.3)	293 (4.7)	107 (1.7)	96 (1.5)
65+	5,304	1,388 (26.2)	539 (10.2)	203 (3.8)	437 (8.2)
Race/Ethnicity					
White	13,402	1,386 (10.3)	484 (3.6)	153 (1.1)	335 (2.5)
Black	7,555	889 (11.8)	333 (4.4)	129 (1.7)	142 (1.9)
Hispanic	4,430	195 (4.4)	74 (1.7)	28 (0.6)	25 (0.6)
Other	3,498	201 (5.7)	71 (2)	29 (0.8)	45 (1.3)
Nursing home					
Yes	1,538	327 (21.3)	113 (7.3)	36 (2.3)	219 (14.2)
No	21,214	1,757 (8.3)	594 (2.8)	191 (0.9)	154 (0.7)
Missing	6,133	587 (9.6)	255 (4.2)	112 (1.8)	174 (2.8)
TOTAL					
	28,885	2,671 (9.2)	962 (3.3)	339 (1.2)	547 (1.9)

Abbreviations: ICU = Intensive care unit.
Note: – Cells with N fewer than 11 are not shown.

24, 2020, (2) with matching HASH IDs between the ADH and APCD databases, (3) having at least a six-month continuous insurance coverage period between 2013 to June 2019, and (4) not currently incarcerated. In total, 28,885 COVID-19 cases met these criteria and were included in the analytic study population.

Outcomes of interest included yes/no responses for being hospitalized, admitted to ICU, intubation, and death. The association of the outcomes with COPD, asthma, coronary heart disease (CHD), congestive heart failure (CHF), other cardiovascular disease, kidney failure, immunocompromised status, essential hypertension, diabetes mellitus, and mental and behavioral disorders were studied. Logistic regression models that included age and gender adjustments were fitted to explore the added association of the preexisting conditions with outcome measures.

Results

Overall study population demographic characteristics, as well as subsets of those hospitalized, admitted to ICU, intubation, and death, are presented in Table 1. Table cells containing fewer than 10 individuals have been suppressed to maintain anonymity of individuals represented in the summary statistics.

As of August 24, 2020, a greater number of females had tested positive in Arkansas compared to males; however, males had higher rates of hospitalization, ICU admission, intubation, and death. It has been presented that the risk for severe outcomes increases with age.[3] Of note, 14% of infected nursing home residents died (14% among APCD sample, 11% among not-in-sample). Severe outcomes were less common among health care workers who were diagnosed with COVID-19, compared to non-health care workers. Rurality of residence, based on Rural-Urban Commuting Area Codes, did not appear to result in a noticeable difference in outcome (data not shown), therefore was not included in our model.[4] Compared to the COVID-19 patients who did not have sufficient data in the APCD and who were thus removed from the sample, patients in the sample were more likely to have been hospitalized (9.2% vs. 5.8%), to have been admitted to the ICU (3.3% vs 2.1%), to have been intubated (1.2% vs 0.8%), and to have died (1.9% vs 0.7%).

Table 2 presents a crude (no demographic adjustment for age or gender) descriptive summary of outcomes by the preexisting conditions under study. COVID-19 cases with at least one preexisting condition incurred higher percentages of experiencing a severe outcome in every instance. Death was an outcome in more than one in 10 cases when the patient had previously experienced kidney failure (12.6%), congestive heart failure (12%), or dementia (15.9%). Dementia had not been reported previously by the CDC as a condition of risk for adverse COVID-19 outcomes.

Table 3 presents the adjusted (accounting for age and gender) relative risks (percentage experiencing outcome/percentage not experiencing outcome) for the preexisting conditions under study. For example, compared to COVID-19 patients without kidney failure, those experiencing kidney failure were estimated to be 1.7 times more likely, with a 95% confidence interval (CI) of 1.5 to 1.9, to be hospitalized, 1.9 times more likely (CI: 1.6-2.2) to be admitted to the ICU, 2.3 times more likely (CI: 1.7-3.1) to be intubated, and 2.1 times more likely (CI: 1.7-2.5) to die.

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Table 2: Descriptive statistics of selected conditions

Clinical Conditions		TOTAL N (%)	Hospitalization N (%)	ICU Admission N (%)	Intubation N (%)	Death
Kidney Failure	yes	916	308 (33.6%)	131 (14.3%)	57 (6.2%)	115 (12.6%)
	no	27,969	2,363 (8.4%)	831 (3%)	282 (1%)	432 (1.5%)
Immunocompromised State	yes	597	156 (26.1%)	63 (10.6%)	29 (4.9%)	50 (8.4%)
	no	28,288	2,515 (8.9%)	899 (3.2%)	310 (1.1%)	497 (1.8%)
Diabetes Mellitus	yes	3,615	888 (24.6%)	347 (9.6%)	134 (3.7%)	216 (6%)
	no	25,270	1,783 (7.1%)	615 (2.4%)	205 (0.8%)	331 (1.3%)
CHF	yes	1,146	362 (31.6%)	154 (13.4%)	54 (4.7%)	137 (12%)
	no	27,739	2,309 (8.3%)	808 (2.9%)	285 (1%)	410 (1.5%)
COPD	yes	1,233	362 (29.4%)	152 (12.3%)	49 (4%)	116 (9.4%)
	no	27,652	2,309 (8.4%)	810 (2.9%)	290 (1%)	431 (1.6%)
CHD	yes	2,213	607 (27.4%)	235 (10.6%)	88 (4%)	174 (7.9%)
	no	26,672	2,064 (7.7%)	727 (2.7%)	251 (0.9%)	373 (1.4%)
Asthma	yes	2,262	257 (11.4%)	89 (3.9%)	31 (1.4%)	55 (2.4%)
	no	26,623	2,414 (9.1%)	873 (3.3%)	308 (1.2%)	492 (1.8%)
Other Cardiovascular Disease	yes	2,370	333 (14.1%)	126 (5.3%)	38 (1.6%)	69 (2.9%)
	no	26,515	2,338 (8.8%)	836 (3.2%)	301 (1.1%)	478 (1.8%)
Mental and Behavioral Disorder	yes	8,287	920 (11.1%)	303 (75.9%)	96 (1.2%)	233 (2.8%)
	no	20,598	1,751 (8.5%)	659 (3.2%)	243 (1.2%)	314 (1.5%)
Essential Hypertension	yes	3,315	463 (14%)	175 (5.3%)	56 (1.7%)	73 (2.2%)
	no	25,570	2,208 (8.6%)	787 (3.1%)	283 (1.1%)	474 (1.9%)
Dementia	yes	889	221 (24.9%)	82 (9.2%)	18 (2%)	141 (15.9%)
	no	27,996	2,450 (8.8%)	880 (3.1%)	321 (1.1%)	406 (1.5%)

Abbreviations: CHD = Coronary Heart Disease; CHF = Congestive Heart Failure; ICU = Intensive Care Unit.

Table 3: Relative risk of selected comorbid conditions adjusted for age and gender (95% confidence interval)

	Hospitalization	ICU Admission	Intubation	Death
Kidney Failure	***1.7 (1.5-1.9)***	***1.9 (1.6-2.2)***	***2.3 (1.7-3.1)***	***2.1 (1.7-2.5)***
Immunocompromised State	***1.7 (1.5-2)***	***1.9 (1.5-2.4)***	***2.4 (1.7-3.5)***	***2.3 (1.7-3)***
Diabetes Mellitus	***1.7 (1.5-1.8)***	***1.7 (1.5-1.9)***	***1.8 (1.5-2.3)***	***1.7 (1.4-2)***
CHF	***1.6 (1.4-1.7)***	***1.8 (1.5-2.1)***	***1.7 (1.3-2.3)***	***1.8 (1.5-2.2)***
COPD	***1.5 (1.3-1.6)***	***1.6 (1.4-1.9)***	1.4 (1-1.8)	***1.6 (1.3-2)***
CHD	***1.4 (1.3-1.5)***	***1.3 (1.1-1.5)***	***1.3 (1-1.7)***	***1.2 (1-1.4)***
Asthma	***1.4 (1.2-1.6)***	***1.4 (1.1-1.7)***	1.4 (1-2)	***1.5 (1.2-2)***
Other Cardiovascular Diseases	***1.2 (1.1-1.3)***	***1.2 (1-1.5)***	1 (0.7-1.4)	1.1 (0.8-1.3)
Mental and Behavioral Disorders	***1.2 (1.1-1.2)***	1 (0.9-1.2)	0.9 (0.7-1.1)	***1.4 (1.2-1.7)***
Essential Hypertension	1 (0.9-1.1)	1 (0.8-1.2)	0.8 (0.6-1.1)	***0.8 (0.6-1)***
Dementia	0.9 (0.8-1.1)	0.9 (0.7-1.2)	***0.5 (0.3-0.9)***	***1.8 (1.5-2.3)***

Abbreviations: CHD = Coronary Heart Disease; CHF = Congestive Heart Failure; ICU = Intensive Care Unit.
Note: Statistically significant findings are in bold italics.

Arkansans who tested positive for COVID-19 and had previously been diagnosed with kidney failure, immunocompromised conditions (immunocompromised conditions were defined based on 2018 and 2019 Healthcare Effectiveness Data and Information Set Value Set Directory, e.g., undergoing chemotherapy or organ transplant, congenital IgA deficiency, or human immunodeficiency virus infection), diabetes mellitus, CHF, or CHD had increased risks of hospitalization, ICU admission, intubation, and death compared to COVID-19 patients without these conditions. COVID-19 patients with COPD or asthma also experienced higher risks of hospitalization, ICU admission, and death than patients without these preexisting conditions. Cardiovascular diseases other than CHF and CHD also increased the risk of hospitalization and ICU admission. Essential hypertension, however, was associated with a reduced risk of death.

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COVID-19 patients with dementia continued to demonstrate a higher likelihood of death, 1.8 times (CI: 1.5-2.3) more likely to die, but did not have a higher risk of hospitalization or ICU admission and had a lower risk of intubation than COVID-19 patients without dementia. After removing nursing home residents, the association of dementia with death persisted, with an increased relative risk of 2.0 times (CI: 1.3-3.1).

Discussion

Our study documents the increased risk for poor outcomes due to COVID-19 for specific chronic conditions in Arkansas. These findings will assist Arkansas physicians to provide advice to patients to mitigate their risk and potentially identify individuals for enhanced protection and early vaccination, when available.

Our findings depicting elevated risk for severe outcomes among COVID-19 patients with a history of kidney failure, immunocompromised conditions, serious heart conditions, and diabetes mellitus are consistent with those documented by the CDC. The results presented herein confirm similar elevated risks as previously documented. However, to our knowledge, we present a new association between history of dementia and death in Arkansas COVID-19 cases, particularly for those not in a nursing home setting.

Limitations to this study include an inability to include individuals not in the APCD. Another limitation is that we were not able to assess the degree to which obesity affects outcomes of COVID-19 infections due to insufficient data on weight status among positive patients. Arkansas has one of the highest obesity rates in the U.S. with 37.3% of adults estimated to be experiencing obesity, which has been shown to be one of strongest indicators for the worse outcomes of COVID-19.[5-6]

Ongoing use of the APCD to examine ongoing effects of COVID-19, new associations of conditions associated with poor outcomes, and the health care costs associated with COVID-19 are anticipated.

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PEOPLE + EVENTS

OBITUARIES

SPRINGDALE - **Lee Bryan Parker Jr., MD**, passed away August 13, 2020.

Dr. Parker is survived by wife Beverly; children Susan (David) Brewer, Lobby (Doug) Beecher, Steven (Betsey) Parker, and Lynn Hegwood; 10 grandchildren; and 18 great grandchildren. He was the original director of the Area Health Education Center (AHEC), Northwest. His passion was teaching. Even after retirement, until last year he served as an adjunct faculty member training family-practice physicians.

LITTLE ROCK - **William "Bill" H. Riley Jr., MD**, passed away August 28, 2020.

Dr. Riley practiced medicine in Little Rock for over 50 years and was a co-founder of The Family Clinic, now St. Vincent Family Clinic. He served as assistant clinical professor in the Department of Family Medicine at UAMS. He was a past president of the medical staff at Baptist Health and was a member of the medical staff at SVI. He was a member of Pulaski County Medical Society, Arkansas Medical Society, American Medical Society, and Arkansas Academy of Family Physicians. He was a Charter diplomat of the American Board of Family Practice and a Fellow of the American Academy of Family Physicians.

Dr. Riley is survived by his wife Robbie Braunfisch Riley; daughters Robin (Robert) Smith, Rayma Ross, and Beth (Richard)Richard; and stepsons Albert (Traci) Braunfisch and Pete (Kristen) Braunfisch. He is also survived by 13 grandchildren and four great-grandchildren.

LITTLE ROCK - **K. David McKelvey, MD**, passed away August 26, 2020.

After completing his internship, David joined the U.S. Air Force as a Captain in the Medical Corps and was detailed to the U.S. Army. David served a two-year tour of duty in Vietnam; for 13 months of this, he served as an anesthesiologist in Long Binh. After seeing so much pain and death in Vietnam, David decided that he'd much rather bring life into the world; he moved to Memphis, where he completed his OB-GYN Residency at the John Gaston Hospital/University of Tennessee. After residency, David practiced as an OB-GYN for 45 years. He was the oldest surviving partner of The Women's Clinic, to which he devoted much of his life and from which he retired in 2010 after 36 years of service. It has been estimated that David delivered thousands of babies during his career.

Dr. McKelvey is survived by wife Cheri; children Kent D. McKelvey Jr. (Elise Higdon), Samantha McKelvey (Brian Teeter), Betsy McKelvey Peeler (Michael), Matthew McKelvey; and five grandchildren.

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