Impact of the COVID-19 Pandemic on Vaccine Hesitancy Towards Routine Childhood Immunizations in Kansas

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About Me:

- From McPherson, KS
- B.S. in Biology
- Microbiologist/Pharmacologist
- Health and Science Specialist
- Family
- Sports/Coaching

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Outline:

- Literature Review/Motivation for Project
- APE Site/Preceptor
- Methods/Results
- Key Takeaways
- Products
- MPH Competencies
- Acknowledgements/Questions/References

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Literature Review:

Since 1974, it is projected that **146 million** lives of children under five years of age have been saved because of vaccines. Immunizations have accounted for **40%** of the decline in infant mortality globally (Shattock et al., 2024).

Vaccine Hesitancy

Definition: “The delay in acceptance or refusal of vaccines despite availability of vaccine services”. The World Health Organization listed vaccine hesitancy as a top ten threat to global health in 2019 (Eichman, 2024).

- Movement in Stockholm, Sweden to reject vaccines due to personal freedoms in 1873 led to mortality rates from smallpox 10 times higher than the rest of Sweden (Grimes, 2025).
- Dr. Andrew Wakefield’s disproved theory that the measles-mumps-rubella vaccine was linked to autism in 1998 set back immunizations for years (Qian, 2020)

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Literature Review (cont…):

COVID-19 Pandemic Impact in US, 2020

The first case of COVID-19 was confirmed in the United States on January 21, 2020 in the state of Washington (*AJMC*, 2025)

By the end of 2020, The Centers for Disease Control and Prevention listed COVID-19 as the underlying or contributing cause of death in **377,883** individuals and the third leading cause of death in the United States (*MMWR*, 2021).

Introduction of COVID-19 Vaccines

With the formation of Operation Warp Speed, large-scale efficacy trials of COVID-19 vaccines began in July, 2020 and the first vaccine available to protect against COVID-19 was granted Emergency Use Authorization on December 11, 2020 (Hall, 2022).

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Literature Review (cont…):

A study published in the British Medical Journal found that during the first year of COVID-19 vaccine availability (December 14, 2020 – December 18, 2021) among 2558 counties in the United States, for every 10% improvement in vaccination coverage, there was an 8% reduction in mortality rates and a 7% reduction in COVID-19 incidence (Suthar et al., 2022).

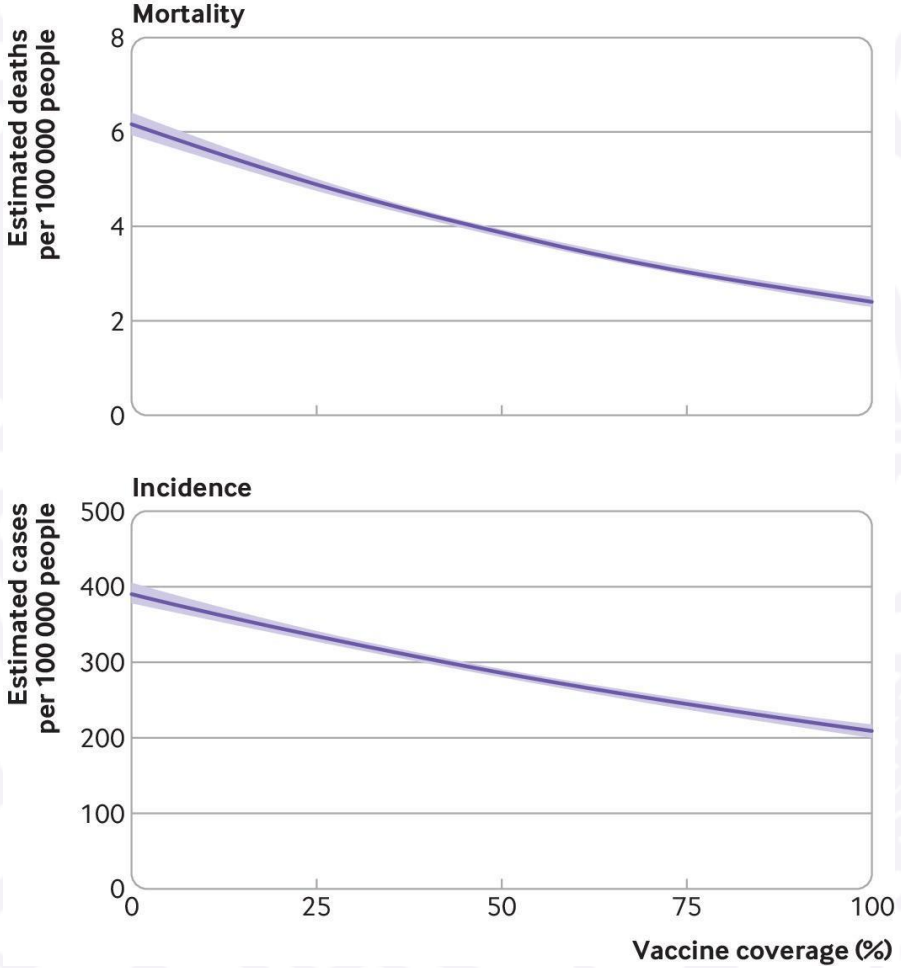

Fig 1.1: "Effect of vaccination coverage on COVID-19 related mortality (top) and incidence (bottom) during first year of vaccine roll-out. Analyses are from 2558 counties in 48 US jurisdictions. Model controlled for county population size, social vulnerability index, and mobility changes" (Suthar et al., 2022)

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Childhood Immunization Rates in Kansas

Vaccination rates have declined for kindergarten aged students in Kansas since 2019-2020. Religious exemptions for receiving kindergarten vaccines went from 1.86% to 3.29% during this time (KDHE, 2025).

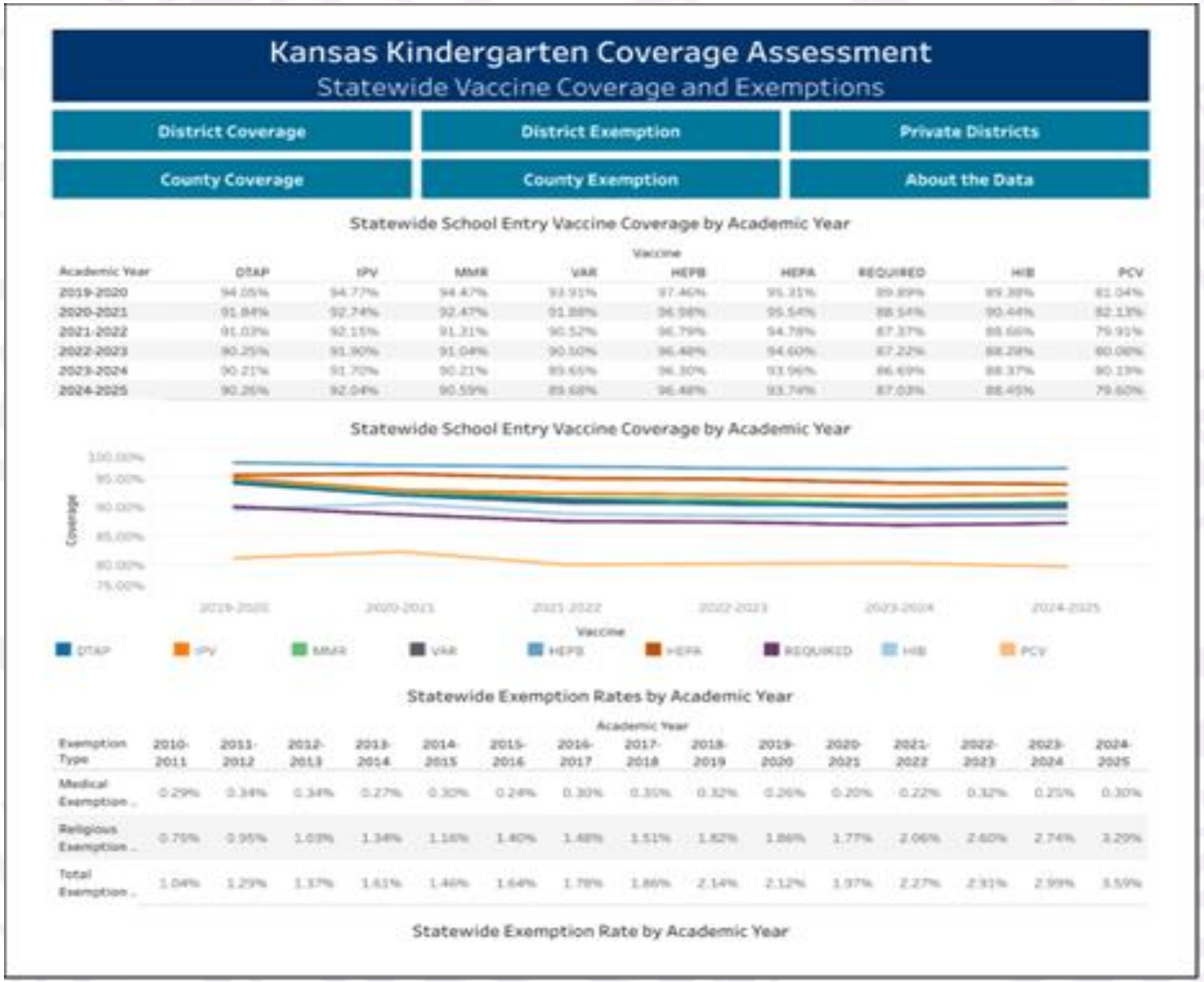

Figure 1.2: Immunization data of Kindergarten students (KDHE, 2025)

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APE Site/Preceptor:

ENVISAGE Consulting, Inc.

Connie Satzler, President

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Methods:

- 17 Question Survey
- In-person interviews/Recorded/ Transcribed
- Inductive thematic analysis
- No predetermined themes
- IRB #12927 approved by Kansas State University Institutional Review Board

Category	Facility Type/Location/Provider	Count	Percentage
Facility Type			
	Health Department	22	73.3%
	Private Practice Pediatric	8	26.7%
Location			
	Urban	10	33.3%
	Semi-Urban	11	36.7%
	Densely-settled Rural	5	16.7%
	Rural	4	13.3%
Type of Provider			
	Pediatrician	3	9.1%
	Nurse Practitioner	1	3.0%
	MA	1	3.0%
	LPN	1	3.0%
	Immunization Nurse	11	33.3%
	Nurse Manager (Director, Supervisor, Manager, Coordinator, etc.)	16	48.8%

Table 1.1: Participation in surveys

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Results:

Question #4: Could you describe your process for recommending available vaccines for children, from the time a family walks in the door through vaccination?

Table 1.2: Themes in recommending available vaccines for children

Code	Theme	Examples
1	All recommended vaccines offered (23/30 – 76.7%)	*"We recommend everything that is on the routine schedule."* *"We go through all recommended vaccines that they are due for."* *"…we still recommend they get all of them – everything recommended from the CDC, not just what is required for school."*
3	Let parents choose options of vaccines or delayed schedule (13/30 – 43.3%)	*"…we give them the options of what they need. We let them decide which vaccines they will get."* *"You can usually tell if a parent is hesitant. Then we adjust how we say it, like 'the school is going to require these'. If they want to split them up we can do whatever they are comfortable with."* *"Some will want to do a slow schedule. It's frustrating, but I try to work with them so they get something."*
2	Vaccine compliant policy (4/30 – 13.3%) (all 4 locations were private pediatric offices)	*"We have a policy that patients have to be up to date on vaccines to be patients here…We tell them that this is what they are due for today. It is not optional."* *"We are a vaccine compliant facility, so all patients must follow the CDC required vaccines for school entry, and we follow their guidelines for administration windows."*

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Results (cont…): Question #9: Do you track adherence rates for recommended immunizations for children?

Table 1.3: Routine childhood immunization adherence rate tracking

Code	Private Pediatric Office	Health Department	Theme	Examples
1	5 (62.5%)	12 (54.5%)	Yes/We do	*"Yes. We get reports of missed opportunities."* *"Yes. Very closely."*
2	1 (12.5%)	6 (27.3%)	We can	*"We can, but we don't typically track rates."* *"We could pull data from the state registry. Our EHR has the ability as well."*
4	2 (25.0%)	1 (4.5%)	No	*"No."*
3	0	3 (13.6%)	I'm not sure	*"I'm not sure. We are working on that"* *"I don't know. We probably do."*

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Results (cont…):

Question #10: Have you seen a difference in adherence rates in children from 2019 to 2024? If so, which vaccine adherence rates have changed?

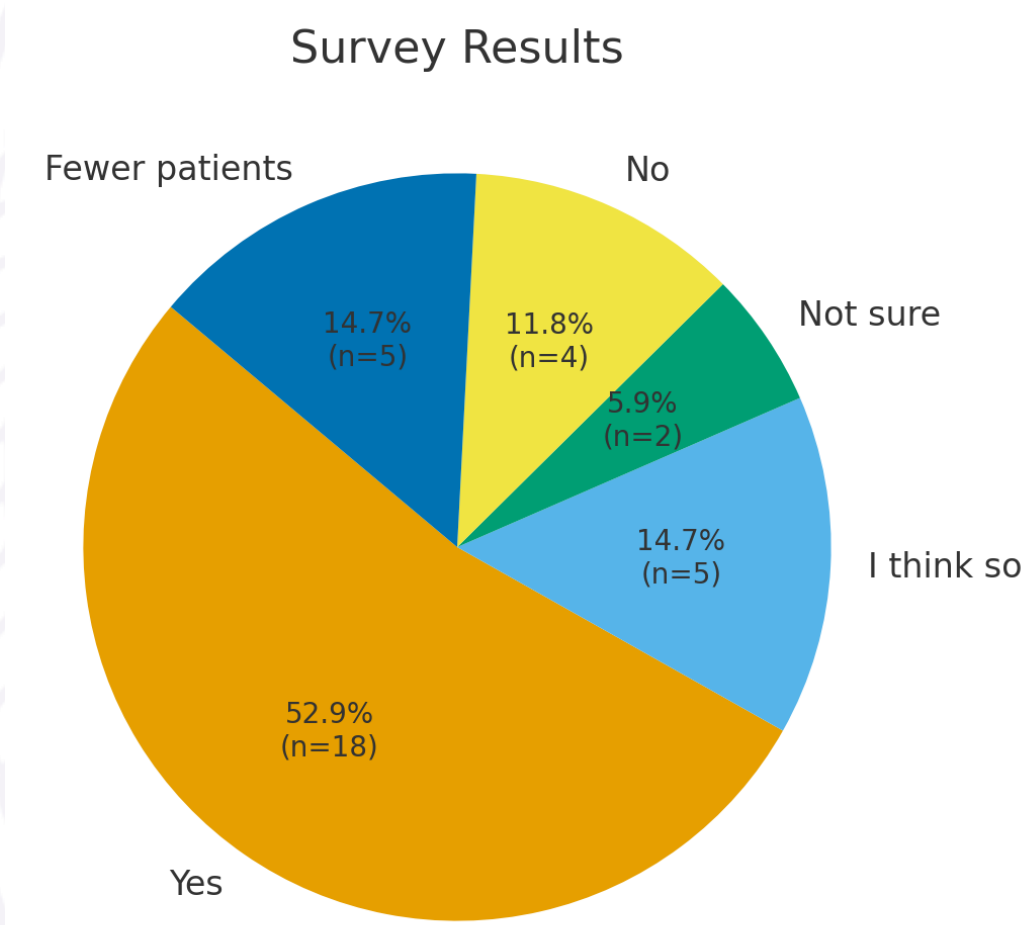

Figure 1.3: Observation of difference in adherence rates in children from 2019 to 2024.

Table 1.4: Vaccines with declining rates

Mentioned vaccine adherence rates declining	Frequency
All Vaccines	9
HPV	5
MMR	5
Influenza	5
COVID	4
Hepatitis B	2
Combination Vaccine	2
Any New Vaccine	1
Meningitis B	1

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Results (cont…):

Question #11: Describe changes in conversations with parents when it comes to routine childhood immunizations over the past five years.

Table 1.5: Predominant themes: Changes in conversations over the past five years

Code	Theme	Examples
1	More information/longer conversations (9/29 – 31.0%)	*"We do spend more time answering some of the questions (parents) bring in from YouTube videos. That shifts to where we have to give more information on the ingredients and finding out where all of this comes from. We deep dive more with some families."* *"We give a lot more information than we used to because they ask for it, and we know that information is the best way to get them to change their mind."*
2	Ask for delayed or alternate schedules (7/29 – 24.1%)	*"More parents are coming in splitting or delaying the vaccines more than they were before COVID."* *"There are a number of parents who are spreading them out farther than before."*
6	Misinformation/safety concerns (6/29 – 20.7%)	*"Parents are seeing a lot on social media, so they are asking more than they were before the pandemic. Asking if they will get 'antigen overload'."* *"All the misinformation and disinformation about the COVID vaccine has spilled over and has affected all vaccines."*
8	More fatigued/weaker recommendations (5/29 – 17.2%)	*"I feel like I'm inquiring rather than presenting information."* *"At two months when we start, I feel like I'm gun shy about getting into vaccination. I'm supposed to sell it more, but I have felt a little more fatigued. I am more reserved now about getting into vaccination schedule."*
3	Afraid COVID-19 shot will be slipped in (4/29 – 13.8%)	*"…we heard people asking if we were slipping the COVID vaccine in with others."* *"A lot of people think that we sneak the COVID vaccine in with other vaccines."*
7	More urgent/stronger conversations (4/29 – 13.8%)	*"I know we make it more urgent to them now when we recommend vaccines."* *"Stronger encouragements. I changed how I present it. I now say that this is what is recommended at this age instead of just what is required by schools."*

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Results (cont…):

Question #12: What new challenges have you experienced since 2019 when it comes to following standard immunization schedules for children?

Table 1.6: Predominant new challenges following immunization schedules for children since 2019

Code	Theme	Examples
1	Social media information (8/28 – 28.6%)	*"There are more 'wellness influencers' and misinformation that we need to address now."* *"With the internet giving so much information, people have more questions, so it is time consuming to answer all of these questions."*
5	Complications with alternate schedules and changing recommendations (8/28 – 28.6%%)	*"I'm seeing so many more people who want to proceed forth with an alternate schedule…"* *"More people want to do a delayed schedule or on their own schedule. A lot of people only want one shot given each visit. Prioritizing vaccines and figuring out what the parents are ok with is a newer challenge."*
2	Political information (5/28 – 17.9%)	*"Currently with the political forefront, there are more challenges. I am very worried and very concerned about what is happening. I'm worried about ACIP being reorganized."* *"Trying to keep political issues out of it and focusing on the medical side of vaccines."*
4	More vaccine hesitancy (5/28 – 17.9%)	*"It feels like people are more wary of all vaccines, not just the COVID vaccine or the flu vaccine."* *"They are hesitant because there is so much information on both sides of it that it can be overwhelming, so they just say they want to do something in the middle and slow it down a little."*

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Results (cont…):

Question #13: What reasons are given by parents when not accepting all recommended childhood immunizations for their children?

Table 1.7: Predominant reasons given by parents when not accepting recommended childhood vaccines

Code	Theme	Examples
1	Side effects/Local reactions (9/29 – 31.0%)	*"They are fearful of side effects."* *"They are afraid of the child being sore or have fevers."*
4	Spread out shots/antigen overload (7/29 – 24.1%)	*"They don't want the antigen overload – don't want so many vaccines at once."* *"Too many at one time. It will overload their system."*
6	Don't trust ingredients (7/29 – 24.1%)	*"Ingredients/preservatives are concerns."* *"We've heard a lot about metal toxins in vaccines. Parents bring in information about how much aluminum is in a vaccine."*
9	Don't give a reason (5/29 – 17.2%)	*"A lot of times there is no reason given."* *"They have decided that they don't want to vaccinate. They don't necessarily give a reason."*
2	Autism (3/29 – 10.3%)	*"Some long-term parents who have a new child don't want vaccines of a sudden because they know someone who was diagnosed with autism after receiving a vaccine."* *"Or it's the autism concern."*
3	Political reasons (3/29 – 10.3%)	*"If they are very political, they don't trust the government."* *"The person in charge of HHS says that it's not safe."*

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Results (cont…):

Question #16: What resources do you need to help combat vaccine hesitancy?

Table 1.8: Predominant resources needed to help combat vaccine hesitancy

Code	Theme	Examples
2	Social media presence (8/30 – 26.7%)	*"I think what we could benefit from is a voice, or several voices, in the spaces where these people go to find information. If TikTok or YouTube is where they are going to go, we can't think they are going to go read a journal. We need to have a presence where they are."* *"Maybe a social media site that combats the social media information that they are seeing."* *"Things we can link to our own social media to help combat the misinformation that people get from social media."*
3	Fact sheet (6/30 – 20.0%)	*"Numbers, like rates of cases in the US that are up to date. Information sticks out. If it's accessible and easy to find and give to patients so they can understand the risks of the disease."* *"A fact sheet. A big paragraph about the importance of vaccines and how it actually helps other people."*
6	Staff training (5/30 – 16.7%)	*"More training or education about what false information is out there. It's easier to shut down false information when we know what people are hearing. Little training sessions that talk about new concerns that we are hearing and then here is evidence to refute that."* *"We are doing more training on how to approach certain vaccines with families. Specific messaging on how to share information without trying to scare parents. More training in this area would be helpful."*
1	Disease-state posters (3/30 – 10.0%)	*"We love posters that show pictures of vaccine preventable diseases."* *"Infographic posters – here are symptoms, this is what the disease can look like. Things that show how devastating these diseases can be."*

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Key Takeaways:

- There have been lasting effects on routine childhood immunizations from COVID-19
- Training for immunizers would be beneficial to help communicate the importance of vaccines (16.7%) as well as adherence tracking (45.4% of Health departments surveyed were not sure or don't track adherence rates)
- Social media misinformation concerning vaccines has been significant in Kansas (28.6%)
- Immunizers would like to use social media to spread accurate vaccine information (26.7%)
- Useful sites: Dr. Rubin TikTok videos, backtothevax.com, knowyourvaccines.org, Booklet – Vaccine Fears Overturned by Facts

Key Takeaways (cont…):

A large percentage of participants mentioned the need for better communication/empathy towards parents (43.5%)

"I think one of the biggest things that we sometimes forget about or we miss, is that these are well-intentioned people who are doing what they think is the right thing by their child…All these things are fed into their social media feeds. It caters to what you've already been watching and what you are interested in, so it feeds into their fears. They are just a product of fear mongering. They are not bad humans, and I think they get very defensive. That's the space we need to approach them in…But this form of vaccine hesitancy feels different, and the amount of misinformation available to these people is different…and we have to find a space where we can move forward and help people with empathy for them, giving them grace, and not making them feel bad."

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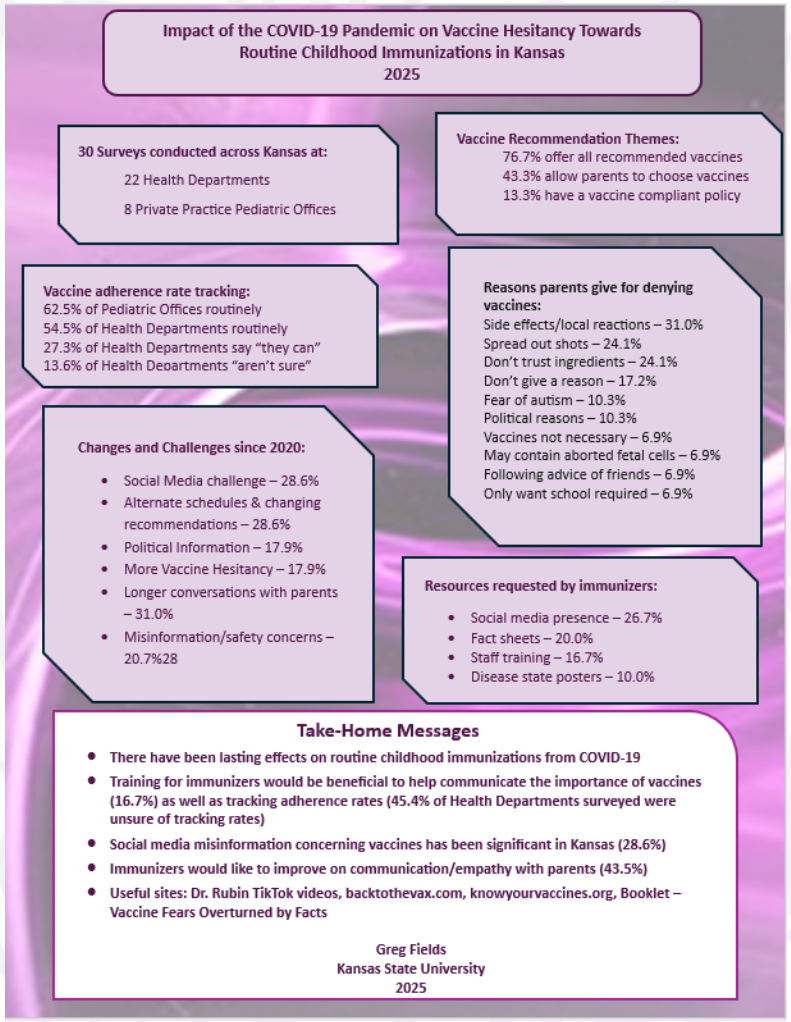
Products:

One-page summary of results and Take-Home messages.



Impact of the COVID-19 Pandemic on Vaccine Hesitancy Towards Routine Childhood Immunizations in Kansas
2025

30 Surveys conducted across Kansas at:
22 Health Departments
8 Private Practice Pediatric Offices

Vaccine Recommendation Themes:
76.7% offer all recommended vaccines
43.3% allow parents to choose vaccines
13.3% have a vaccine compliant policy

Vaccine adherence rate tracking:
62.5% of Pediatric Offices routinely
54.5% of Health Departments routinely
27.3% of Health Departments say "they can"
13.6% of Health Departments "aren't sure"

Reasons parents give for denying vaccines:
Side effects/local reactions – 31.0%
Spread out shots – 24.1%
Don't trust ingredients – 24.1%
Don't give a reason – 17.2%
Fear of autism – 10.3%
Political reasons – 10.3%
Vaccines not necessary – 6.9%
May contain aborted fetal cells – 6.9%
Following advice of friends – 6.9%
Only want school required – 6.9%

Changes and Challenges since 2020:
- Social Media challenge – 28.6%
- Alternate schedules & changing recommendations – 28.6%
- Political Information – 17.9%
- More Vaccine Hesitancy – 17.9%
- Longer conversations with parents – 31.0%
- Misinformation/safety concerns – 20.7%28

Resources requested by immunizers:
- Social media presence – 26.7%
- Fact sheets – 20.0%
- Staff training – 16.7%
- Disease state posters – 10.0%

Take-Home Messages
- There have been lasting effects on routine childhood immunizations from COVID-19
- Training for immunizers would be beneficial to help communicate the importance of vaccines (16.7%) as well as tracking adherence rates (45.4% of Health Departments surveyed were unsure of tracking rates)
- Social media misinformation concerning vaccines has been significant in Kansas (28.6%)
- Immunizers would like to improve on communication/empathy with parents (43.5%)
- Useful sites: Dr. Rubin TikTok videos, backtothevax.com, knowyourvaccines.org, Booklet – Vaccine Fears Overturned by Facts

Greg Fields
Kansas State University
2025

Presentation to Immunize Kansas Coalition at quarterly meeting. Nov. 7, 2025

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MPH Competencies:

Table 1.9: Synthesis and integration of MPH foundational and IDZ competencies

Number and Competency		Description
MPH 2	Select quantitative and qualitative data collection methods appropriate for a given public health context	I conducted surveys with thirty immunizers from across the state of Kansas to evaluate themes of vaccine hesitancy challenges. Quantitative data was organized to determine common use of standing orders, location and type of clinics, use of public-pay versus private-pay vaccines, and time spent giving immunizations. I used inductive thematic analysis to categorize emerging themes found in qualitative data. These themes allowed me to integrate both data collection methods to evaluate challenges that immunizers experience because of the COVID-19 pandemic.
MPH 4	Interpret results of data analysis for public health research, policy or practice	I compiled survey data and presented information to Immunize Kansas Coalition. This data was organized in a manner to evaluate recent challenges that immunizers encounter with their patients in Kansas regarding childhood vaccine hesitancy and possible solutions to overcoming barriers they experience. This information will help create updated resources for healthcare workers in combating vaccine hesitancy.
IDZ 2	Host response to pathogens/immunology	I summarized the pathogenesis of infectious diseases and immune protection through reading and assignments in AAI 852 (Vaccinology). In MPH 754, (Epidemiology), I assessed the importance of adherence rates in vaccines and challenges to preventing disease among populations. I synthesized this knowledge into creating a tool to gather current information on the impact of the COVID-19 pandemic on routine childhood immunizations in Kansas. This work is an effort to theorize why Kansas has experienced declining adherence rates in recommended vaccines for children from 2020 to 2025.
MPH 19	Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation	I organized the data gathered from my ILE research and compiled the findings in a one-page document. This document was created to assist public health workers manage resistance to routine vaccines for children in Kansas. Current objections and recent successes are described in the document. I also had the opportunity to present these findings to the Immunize Kansas Coalition at their quarterly meeting virtually. A summary of my research and the one-page document were both presented at this meeting with an opportunity to address any questions from this organization.

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Questions:

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