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Correlates of Vaping Around the Time of Pregnancy: Data from the Kansas Pregnancy Risk Assessment Monitoring System (PRAMS), 2017-2019

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Background

While smoking during pregnancy has consistently been a concern among health professionals, vaping during pregnancy has garnered increased attention over the last several years. Effects of vaping are not as well studied as the effects of cigarette smoking; however, research has shown that vaping is not harmless.^{1,2} In fact, toxic chemicals can be found in e-cigarettes, and breathing in secondhand aerosol is not safe.¹

Many pregnant persons are motivated to quit tobacco use while pregnant in order to protect their baby.³ However, after birth it is not uncommon to relapse – especially when exposed to secondhand smoke.⁴ This is of particular concern because secondhand and thirdhand smoke or aerosol in homes can be harmful to all who live there, including babies and children.

Secondhand smoke is the exhaled smoke from cigarettes and the smoke from a burning cigarette.⁵ Secondhand aerosol is the exhaled aerosol from an electronic nicotine delivery system (ENDS).^{1,6} Both secondhand smoke and secondhand aerosol can be inhaled by individuals in close proximity. Secondhand smoke and aerosol contain many chemicals, some of which are toxic and/or carcinogenic.^{1,5,6} For infants exposed to secondhand smoke, the risk of Sudden Infant Death Syndrome (SIDS) is significantly higher.⁵ Infants and children are also at increased risk for ear infections, respiratory symptoms, respiratory illness, and asthma when exposed to secondhand smoke.⁵ Children exposed to nicotine from ENDS can experience negative health consequences, including impaired brain and lung development.^{1,7}

Methods

Kansas Department of Health and Environment (KDHE) participates in the Pregnancy Risk Assessment Monitoring System (PRAMS) survey. Each month, about 140 individuals who have given birth to a live infant in the past 2-3 months are randomly chosen to respond to the survey questions by mail per month. If a response is not received, the individual will be called by telephone. Each year, the data are

cleaned and weighted by the Centers for Disease Control and Prevention (CDC), to represent Kansas residents with a recent live birth in Kansas during that year.

Data were analyzed from the 2017-2019 Kansas PRAMS. Weighted prevalence estimates, representing Kansas residents who recently gave birth in Kansas, were calculated in SAS-callable SUDAAN version 11.0. Chi-square tests were used to assess for statistically significant associations between selected maternal and pregnancy characteristics and ENDS use in the 3 months before pregnancy. The PRAMS questionnaire defined ENDS as “E-cigarettes (electronic cigarettes) and other electronic nicotine products (such as vape pens, e-hookahs, hookah pens, e-cigars, e-pipes) are battery-powered devices that use nicotine liquid rather than tobacco leaves, and produce vapor instead of smoke.”

Results

4.8% (95% CI: 3.9%-6.0%) of individuals reported vaping 3 months prior to pregnancy while only 1.4% (95% CI: 0.9%-2.1%) reported vaping during the last 3 months of pregnancy. ENDS use was correlated with cigarette smoking. Among those who reported smoking cigarettes in the 3 months before pregnancy, 16.4% (95% CI: 12.6%-21.1%) also used electronic vapor products during that time (dual use). By comparison, only 1.9% (95% CI: 1.4%-2.8%) of those who were not smoking cigarettes reported using ENDS during this time. There was not enough evidence to show that the prevalence of self-reported ENDS use during the 3 months before pregnancy varied significantly by race/ethnicity.

In addition to cigarette smoking, the prevalence of self-reported ENDS use in the 3 months before pregnancy varied by social determinants of health, including socioeconomic status, access to basic needs, and social support. Prevalence also varied by self-reported depression and anxiety. Statistically significant associations were seen by pregnancy intention and age.

Among those who reported both smoking and vaping in the 3 months before pregnancy, the top 3 barriers to quitting smoking were loss of a way to handle stress, cravings for a cigarette, and other people smoking around them. See Figure A.

Discussion

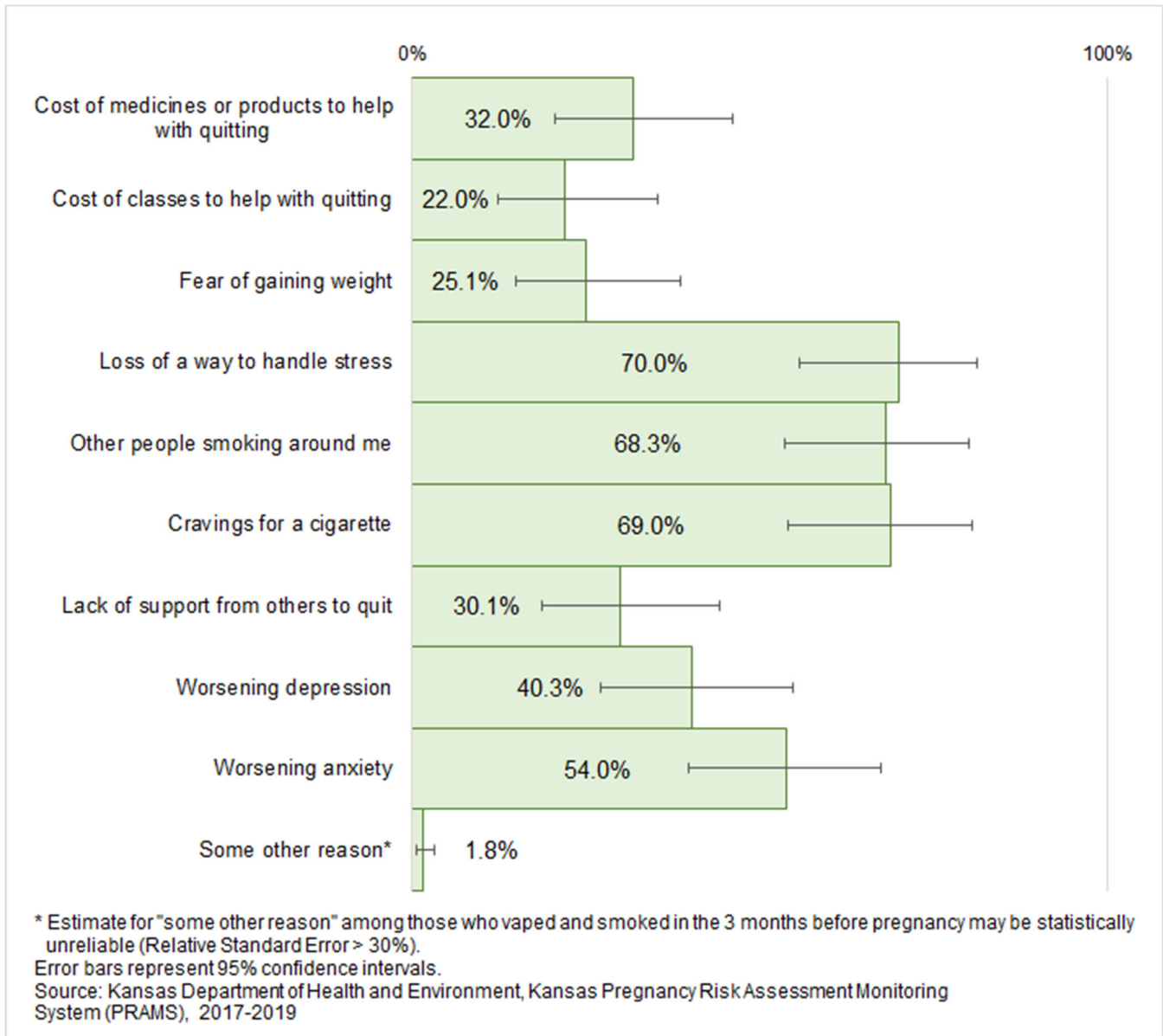
Social determinants of health are relevant to differing prevalence rates in ENDS use during pregnancy. Individuals with lower incomes, lower educational attainment, who were uninsured or on Medicaid prior to pregnancy, who received WIC food during pregnancy, who had fewer sources of social support, or who had unmet basic needs during pregnancy had a higher prevalence of vaping in the 3 months before pregnancy compared to those with higher incomes, higher educational attainment, had private insurance prior to pregnancy, did not receive WIC food during pregnancy, had more sources of social support, or who did not reporting having any unmet basic needs during pregnancy. Individuals ages 20-24 had the highest prevalence rate of vaping 3 months prior to pregnancy. See Table A.

While postpartum depression is the behavioral health condition most discussed related to pregnant and postpartum persons, the mental health status of a person while pregnant should also be considered. Using tobacco may provide comfort to individuals who experience mental health conditions thus making it harder for them to quit while pregnant. This is evidenced in our analysis by the statistically significant higher prevalence rates of individuals experiencing depression and anxiety who also smoke.

Smoking/vaping decreased during pregnancy versus prior to pregnancy, suggesting a willingness of individuals to reduce harm to their babies. KDHE is committed to helping pregnant persons on their journey to quit smoking and to prevent relapse after the baby is born. Through the Kansas Tobacco Quitline, pregnant persons can enroll in the Pregnancy and Postpartum Program (PPP) which helps individuals during and after pregnancy. The program offers up to 5 coaching calls during pregnancy and

4 coaching calls postpartum. It also provides resources designed specifically to help pregnant persons quit. Counseling is recommended over quitting cold turkey. Individuals who are pregnant should talk to their health care provider if they are interested in nicotine replacement therapy (NRT).⁸ The Kansas Tobacco Quitline is available 24 hours a day, 7 days a week, online and by phone at KSquit.org or 1-800-QUIT-NOW.

Figure A. Prevalence of Specific Self-Reported Barriers to Quitting Smoking Among Kansas Individuals with a Recent Live Birth Who Reported Smoking and Vaping in the 3 Months Before Pregnancy



PRAMS data may be subject to recall bias and social desirability bias. Additionally, in this study, dual use of ENDS and cigarettes was considered as self-report of using either of these in the same timeframe (3 months before pregnancy). However, it is possible that a respondent’s smoking and vaping did not overlap during that period.

Table A. Prevalence of Self-Reported Sociodemographic Characteristics Among Kansas Individuals with a Recent Live Birth Who Reported Using ENDS in the 3 Months Before Pregnancy

ENDS use 3 months before pregnancy	Weighted Prevalence	Standard Error	Lower 95% Limit	Upper 95% Limit
Age				
Under 20 years	12.1%	3.51	6.7%	20.8%
20-24 years	9.0%	1.61	6.3%	12.7%
25 years or older	3.0%	0.47	2.2%	4.1%
Highest education level				
Less than high school*	4.9%	1.71	2.5%	9.6%
High school diploma/GED	8.1%	1.38	5.8%	11.2%
At least some college	3.5%	0.55	2.5%	4.7%
Pregnancy intent, just before pregnancy†				
Intended	2.8%	0.50	2.0%	4.0%
Unintended	7.3%	1.39	5.0%	10.6%
Not sure	8.6%	1.84	5.6%	12.9%
WIC status during pregnancy				
WIC recipient	9.4%	1.41	7.0%	12.6%
Not a WIC recipient	2.9%	0.47	2.1%	4.0%
Health insurance status, 1 month before pregnancy§				
Private	2.4%	0.44	1.7%	3.4%
Medicaid	13.4%	2.47	9.3%	19.1%
No insurance	8.7%	1.81	5.7%	12.9%
Any unmet basic needs during pregnancy¶				
No unmet needs	3.5%	0.52	2.6%	4.7%
Any unmet needs	9.5%	1.61	6.8%	13.2%
Number of types of social support sources during pregnancy**				
0 to 1 source	7.7%	2.00	4.6%	12.6%
2 to 3 sources	6.3%	1.06	4.5%	8.7%
4 or more sources	3.3%	0.60	2.3%	4.7%
Federal poverty level in the year before the birth				
<100%	8.6%	1.34	6.3%	11.6%
100% to 199%	6.3%	1.22	4.3%	9.2%
≥200%	1.7%	0.45	1.0%	2.8%

Self-reported depression, 3 months before pregnancy				
No	3.4%	0.51	2.6%	4.6%
Yes	10.4%	1.73	7.4%	14.3%
Self-reported anxiety, 3 months before pregnancy				
No	2.8%	0.49	2.0%	3.9%
Yes	10.2%	1.43	7.7%	13.3%

* Indicator has a Relative Standard Error > 30% and/or confidence interval width >20% points or >1.2 times the estimate and should be interpreted with caution.

† Respondents who had wanted to be pregnant “then” or “sooner” were classified as intending to become pregnant. Those who had wanted to be pregnant “later” or “didn’t want to be pregnant then or at any time in the future” were grouped as having unintended pregnancies. “I wasn’t sure what I wanted” was retained as its own category.

§ From a question about health insurance status in the month before pregnancy. Insurance is coded as: Private (Private only, both Medicaid & private, any other insurance in combination with private, TRICARE or other military health insurance); Medicaid; and No insurance (no insurance or Indian Health Service only).

¶ Having any unmet basic needs was considered if the respondent indicated having at least one unmet basic need (regardless of their answers to any of the other answer items). Not having any unmet needs was considered as answering that they did not have any of the needs in the question, and not specifying any other unmet need. (Those who indicated not having some of the unmet needs in the question, but left other answer choices blank, were excluded from the analysis.) Any write-in “other” responses that fit the existing answer choices were recoded to those choices. Written responses where the respondent only listed how they coped with unmet needs, or where the respondent listed only non-material unmet needs (e.g., emotional, intimate, or interpersonal needs) were excluded.

** From the question, “During your most recent pregnancy, who would have helped you if a problem had come up? For example, who would have helped you if you needed to borrow \$50 or if you got sick and had to be in bed for several weeks?” Excludes those who did not answer the question at all (e.g., left all answers unchecked and did not write in another response). Written responses were recoded.

Source: Kansas Department of Health and Environment, Kansas Pregnancy Risk Assessment Monitoring System (PRAMS), 2017-2019

Conclusion

Quitting tobacco use while pregnant at any point during the pregnancy can have health benefits. Switching from smoking to vaping while pregnant does not eliminate all risks to the baby and is not considered a safe alternative. Eliminating smoking from a baby’s immediate environment removes secondhand and thirdhand smoke and aerosol exposure.

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Examining the Association Between Arthritis and Mental, Physical, and General Health Experiences Among Kansas Adults

Jeremy Goering, BS, Shannon Metz, MPH, Steven Corbett, MA, PhD

Introduction

Arthritis is inflammation of the joints, often resulting in pain and stiffness that worsens with age[1]. In addition to the physical symptoms of arthritis, about 20% of adults with arthritis also experience adverse mental health outcomes, such as anxiety and depression[2].

Performing normal activities is a challenge for many adults living with arthritis[3, 4]. Though arthritis is a chronic, degenerative condition, patients are encouraged to manage their condition by implementing “self-management” strategies to ease the symptoms of arthritis and improve mental wellbeing[5]. Regular physical activity is an effective way to manage arthritis symptoms and improve the arthritics’ abilities to carry out normal daily activities[6].

One Healthy People 2030 objective is to “Reduce the proportion of adults with arthritis whose arthritis limits their activities – A-2”, and endorses increased physical activity as a means to achieving this objective[4]. Understanding current leisure time physical activity levels and associations with arthritis outcomes will aid in the development of strategies to improve the mental, physical, and general health of Kansans living with arthritis.

Methods

Weighted data from the KS BRFSS between the years 2016 and 2020 were analyzed. See Table 1 for the outcomes of interest and the associated BRFSS survey question.

Results

Arthritis is associated with a higher number of poor mental and physical health compared to those without arthritis.

Between 2016 and 2020 the overall prevalence of arthritis has remained stable, with approximately 1 in 4 Kansans reporting that they have been told they have some form of arthritis (data not shown). When asked how many days out of the last 30 days their mental health was “not good”, respondents with

arthritis were significantly ($p < 0.0001$) more likely to report that they had at least 14 days of poor mental health than those without arthritis. (Figure 1). Trends show that the percentage of respondents with poor mental health has increased from 2016 to 2020 among respondents with *and* without arthritis.

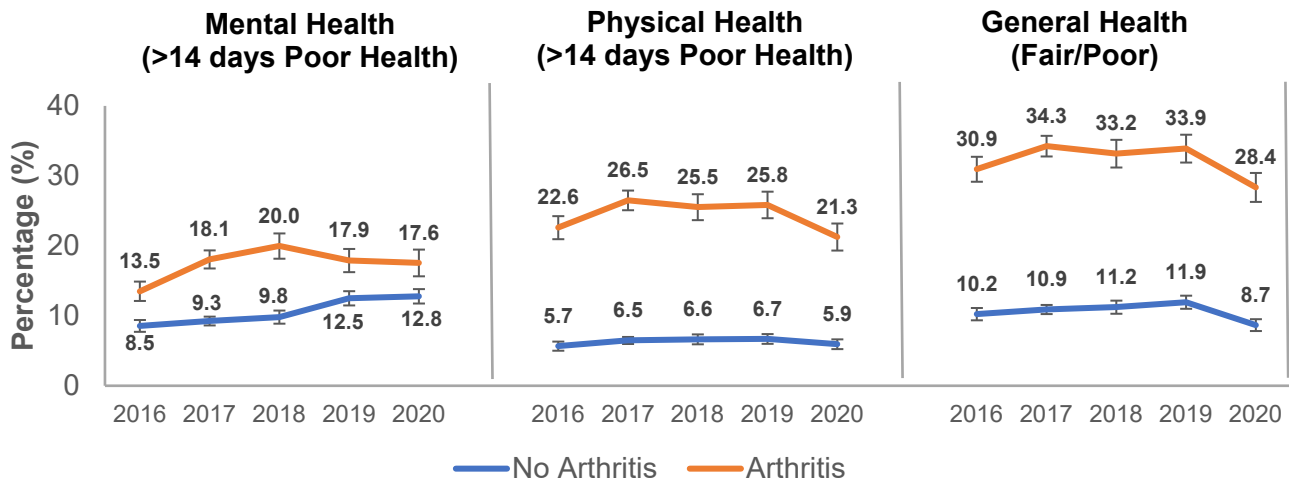
Table 1: Outcomes of Interest and Behavioral Risk Factor Surveillance System (BRFSS) Questions

Outcome of Interest	BRFSS Question
Arthritis	“(Ever told) you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?”
Mental health	“Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?”
Physical Health	Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?
General Health	“Would you say that in general your health is: (1) Excellent, (2) Very Good, (3) Good, (4) Fair (5) Poor.”
Leisure Time Physical Activity	“During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?”

When asked the same question, this time regarding their physical health, respondents with arthritis were significantly ($p < 0.0001$) more likely to report that they have had poor physical health in at least 14 out of the last 30 days compared to those without arthritis (Figure 1). The percentage of Kansas adults who report at least 14 days of poor physical health out of the last 30 days has remained stable among those with and without arthritis.

Additionally, arthritis is associated with perceptions of fair or poor general health. Each year of data shows that Kansas adults with arthritis were significantly ($p < 0.0001$) more likely to report that they have fair or poor general health compared to those without arthritis (Figure 1).

Figure 1: Kansas Adults Aged 18 Years and Older who have had Poor Mental, Physical Health, or General Health for at Least 14 out of the Last 30 Days, KS BRFSS, 2016 – 2020.



Arthritis is associated with less leisure time physical activity.

Between 2016 and 2020, the percentage of Kansas adults who report that they have performed physical activity in their leisure time (outside of their regular job) during the past 30 days is consistently lower among those with arthritis than those without arthritis (Figure 2). This percentage has remained largely unchanged between 2016 and 2020, regardless of arthritis status. Additionally, when looking only at those with arthritis, leisure time physical activity is associated with fewer days of perceived poor mental health and physical health as well as a lower rate of perceived fair/poor general health (Figure 3).

Figure 2: Kansas Adults Aged 18 Years and Older who Report Leisure Time Physical Activity during the Past 30 Days, KS BRFSS, 2016 – 2020

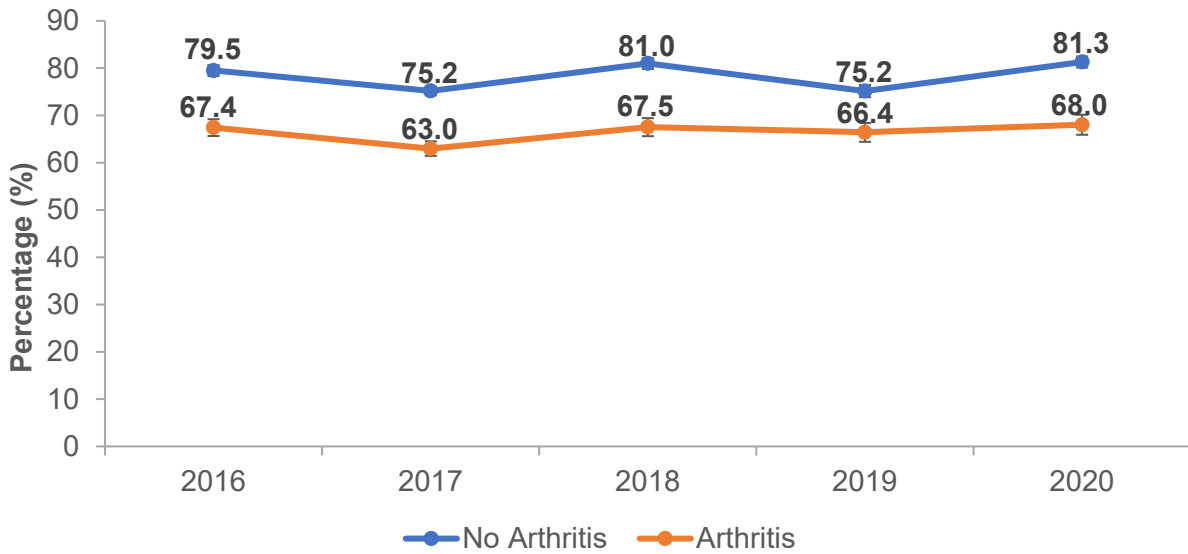
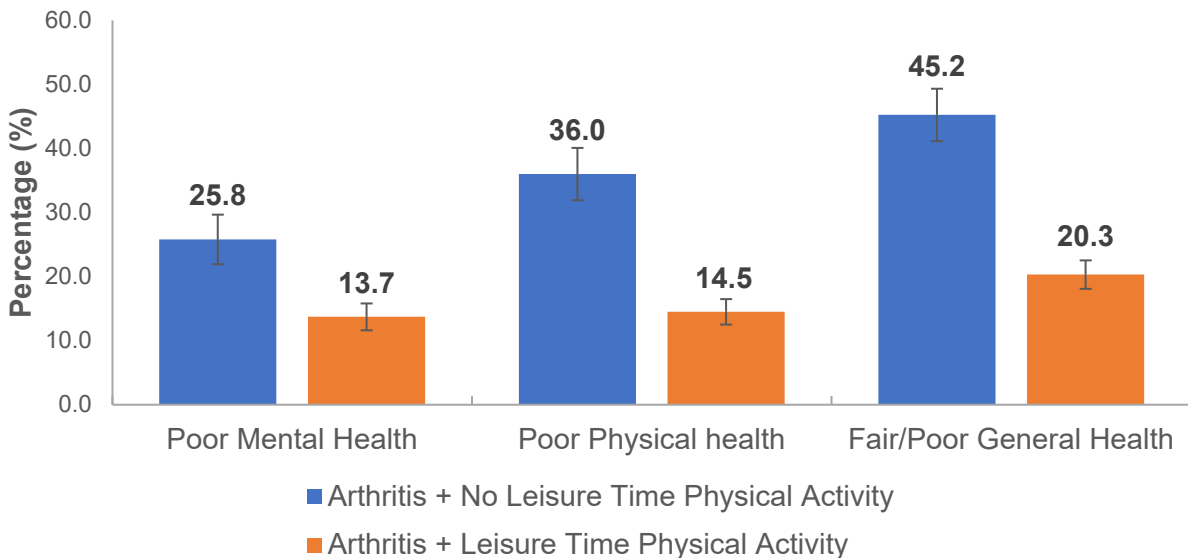


Figure 3: Relationships of Leisure Time Physical Activity with Perceptions of Mental Health, Physical Health, and General Health, among Kansas Adults Aged 18 Years and Older with Arthritis, KS BRFSS, 2020



Discussion

Our findings indicate that the health burdens of arthritis are not limited to the joint pain and stiffness that normally characterizes arthritis. For Kansas adults, arthritis is associated with self-perceptions of poor mental, physical, and general health (**Figures 1**). Thus, both the mental and physical symptoms of arthritis should be considered when seeking to reduce the burden of arthritis. Increasing the percentage of arthritis sufferers who participate in physical activity could be an effective means of supporting the Healthy People 2030 objective of reducing the proportion of adults with arthritis whose arthritis limits their activities.

Physical activity is important to arthritis management and is not only associated with improved joint function, but also improved mood and overall quality of life[6]. Indeed, our data show that physical activity is not only associated with lower rates of physical and general health, but also improved mental health. However, the percentage of Kansas adults who participate in leisure time physical activity remained largely unchanged between 2016 and 2020. Promoting physical activity and improving this stagnant trend of physical activity could help address the burdens of arthritis sufferers.

The results here are subject to certain limitations. BRFSS data are cross-sectional, and causality cannot be inferred. Estimates are likely underestimated. The data might be subject to self-report biases. Non-response bias in sampling remains a possibility.

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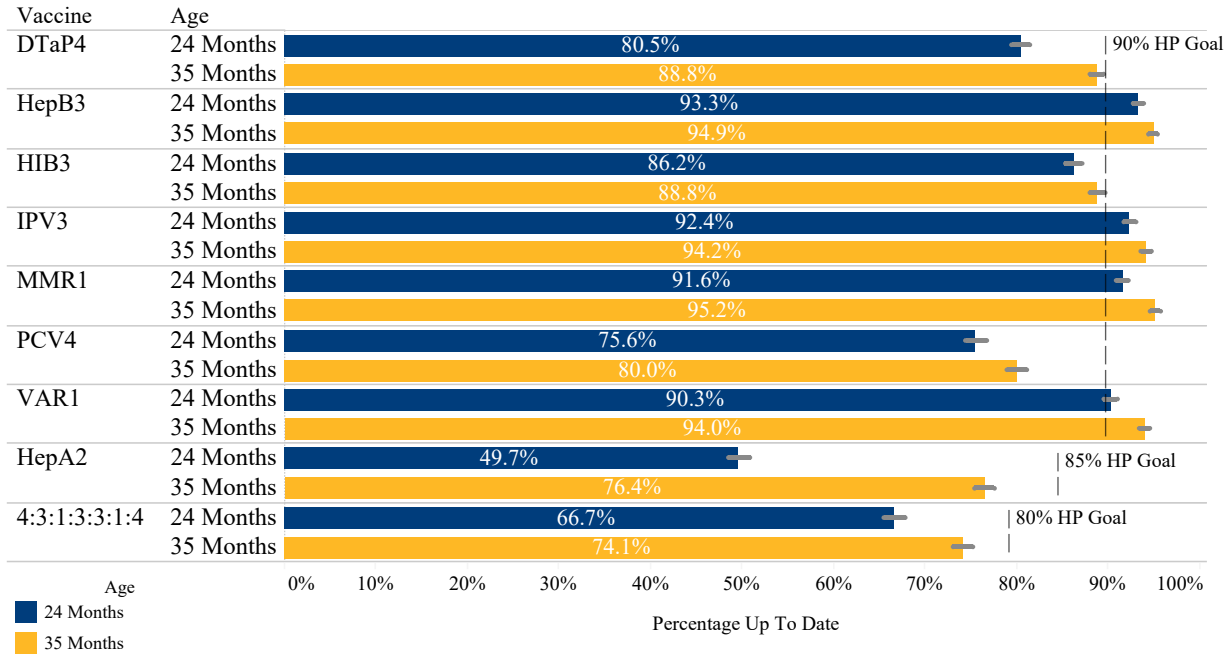
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Retrospective Vaccination Coverage Survey 2014-2015 Results (School Year 2018-2019) Released

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This Retrospective Vaccination Coverage Survey has been released for the School Year 2018-2019. This study sought to measure the vaccination coverage among kindergarten students between the ages of five and seven years on the first day of the academic year and enrolled in either a public or private school in Kansas. For the report, data are examined retrospectively to calculate the vaccination coverage levels of those children when they are 24 and 35 months of age.

Figure 1. Statewide Vaccination Coverage at 24 and 35 Months -- Kansas, 2014-2015†
 Based on retrospective study for school year 2018-2019. The 95% confidence intervals are relatively narrow and are marked above each of the percent bars. Vaccines are ordered alphabetically by age and Healthy People 2020 goal.



† HepA2, Hib3, and PCV4 are not required for school entry, and therefore may not be consistently reported on the vaccination record, which could contribute to the low coverage levels for these three individual vaccines, as well as the 4:3:1:3:3:1:4 series.

Key findings included:

- At the 24 months of age benchmark (Figure 1):
 - The Healthy People 2020 metrics were met for HepB3, IPV3, MMR1, and VAR1
 - They were not met for DTaP4, HepA2, Hib3, PCV4, or series 4:3:1:3:3:1:4
 - HepB3 had the highest coverage at 93.3% and HepA2 had the lowest at 49.7%
- At the 35 months of age benchmark (Figure 1):
 - The Healthy People 2020 metrics were met for HepB3, IPV3, MMR1, and VAR1
 - They were not met for DTaP4, HepA2, Hib3, PCV4, or series 4:3:1:3:3:1:4
 - HepB3 had the highest coverage at 94.9% and series 4:3:1:3:3:1:4 had the lowest at 74.1%
- There was an increase in coverage from the prior year in the DTaP4, HepA2, MMR1, PCV4, VAR1, and 4:3:1:3:3:1:4 vaccinations that was statistically significant
- Kansas had slightly higher coverage than the national average for, DTaP4, HepA2, HepB3, IPV3, MMR1, and VAR1. The coverage for Hib3, PCV4, and 4:3:1:3:3:1:4 in Kansas were lower than the national levels. Except for IPV3, these differences were all statistically significant.
- The following counties met the recommended Healthy People 2020 goals for all vaccine series:
 - Comanche, Dickinson, Doniphan, Ellis, Lincoln, Logan, Meade, Mitchell, Ness, Norton, Pawnee, Phillips, Pratt, Rooks, Scott, Sheridan, and Stevens
- The following counties did not meet the recommended Healthy People 2020 goals for any vaccine series:
 - Chase, Morton, and Wallace

Vaccination coverage is an important component of maintaining a strong and healthy public against preventable disease. To view the full report, visit: <https://www.kdhe.ks.gov/Archive.aspx?ADID=1642>

Identifying Trends for Average Age at Death in Kansas Population Groups

Lara Schmid (KDHE intern)

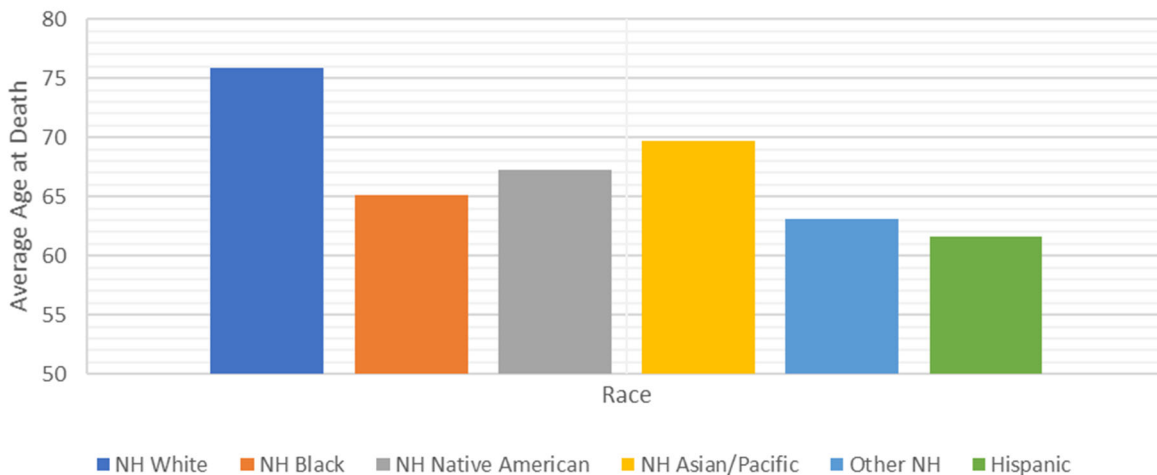
Trends between Average Age at Death and Race

As an Intern for the Vital Statistics Data Analysis team, when I began to investigate life expectancy, I was not sure what trends to expect or what exactly it meant as a matter of fact. According to the National Vital statistics System, life expectancy tells us the average number of years of life a person who has attained a given age can expect to live [1]. This means that when we read something like “Kansas has a life expectancy of XX years” it does not apply to every person. This number would only apply to a newborn in that time period. The average life expectancy at birth for a person born in the United States in 2020 was 77.3 years [2]. Whereas in Kansas this number was slightly lower with the life expectancy reaching 74.3 years of age. Although this number is lower than the national average it has been increasing steadily due to the increased quality in medical care and the ease of access to public health infrastructures throughout Kansas. [2]

Since the majority of people that are reading this article have a couple of years on a newborn, I thought it would be more interesting to investigate the average age at death for a Kansan. What I found were visible differences between sex, race and the leading causes of death that caused this number to vary. These findings did not always align with the trends seen in the rest of America, specifically the differences between the non-Hispanic white and the Hispanic Population. [5]

From the previous figure we can identify that the highest average age at death was within the Non-Hispanic White population with 75.9 years. The next trailing group were Non-Hispanic Asians with a six-year gap in their average age at death of 69.7 years. The group with the lowest average age at death was the Hispanic population with a mere 61.6 years, bringing the difference between the non-Hispanic white population and the Hispanic population to 14.3 years.

Average Age at Death by Race, Kansas, 2020



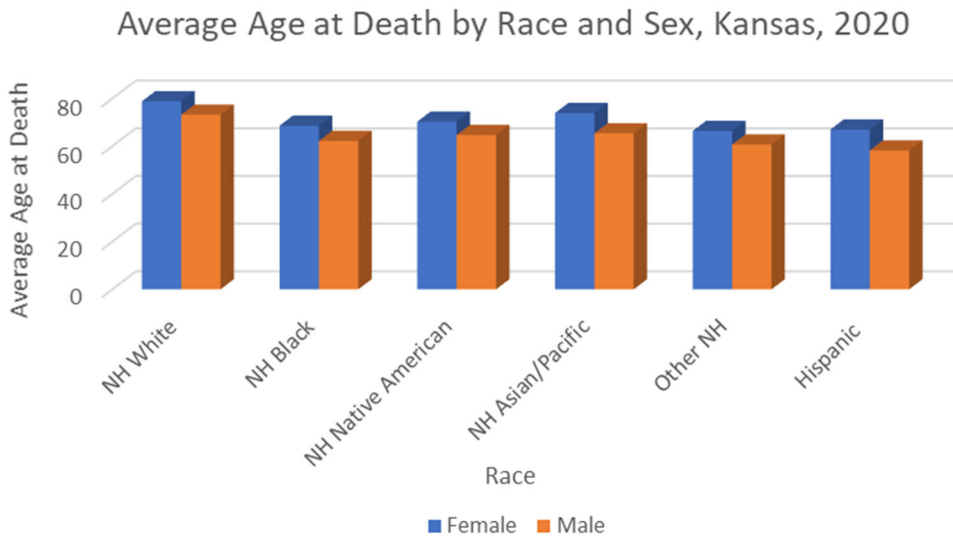
Although this gap was something I expected, I did not expect it to be so great. However, the real head scratcher was that these trends did not match the trends of the United States. What I identified was that the Hispanic population had the highest average age at death throughout the nation usually being

around one to two years longer than the second population group which was the non-Hispanic white population. [5]

Trends between the Average Age at Death and Sex

A trend, that although well-known, could also be identified in Kansas data was the difference in average age at death between females and males.

Among all the races Kansas females have a higher average age at death than Kansas males. Overall, females tended to reach an average age of 77.5 years whereas males only reached about 71.4 years. The biggest disparity in this difference in life span was seen in the Non-Hispanic Asian/Pacific population group, males reached an age of 65.4 years on average while females reached 73.9 years, producing almost a ten-year gap. Non-Hispanic White females reached an average age of 78.8 years in contrast to non-Hispanic black females who reached an average age of 68.6. On the other hand, non-Hispanic white males reached an age of 73.2 and non-Hispanic black males reached an age of 62.2 years.

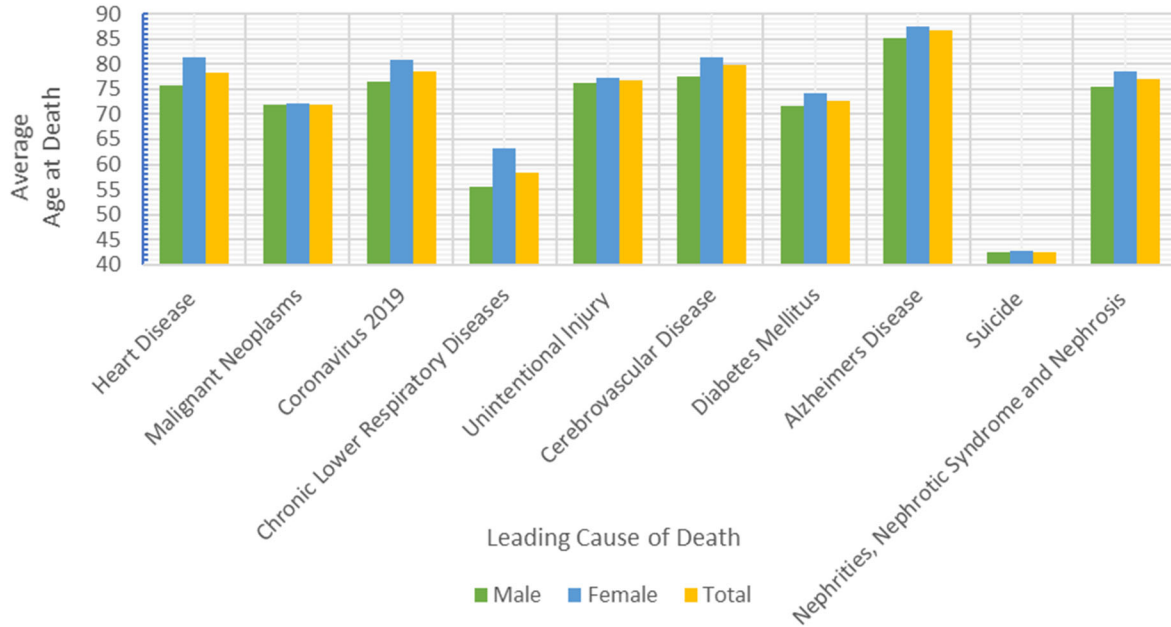


Trends between Average Age at Death and Leading Cause of Death

Below is data broken down into the ten leading causes of death of Kansans and the average age at which they died. Additionally, they are broken up into female, male and the average among both population groups. Categories that should be highlighted are suicide since this is one of the highest causes of death in America [4] and the newly introduced Coronavirus 2019 category which due to its recent emergence previously was not part of this list.

The average age at death due to suicide was 42.6 years with both sexes being within 0.1 years of that average. The biggest age difference at death was found due to chronic lower respiratory diseases, the difference between the sexes was 7.7 years. On average males die due to this illness at 55.6 years whereas females average 63.3 years. Another leading cause that had similar average age at death was malignant neoplasms, males were aged 71.8 years on average and females were aged 72.2 years.

Ten Leading Causes of Death by Average Age at Death and Sex, Kansas, 2020



Summary

Having gathered this data we could identify that there is a noteworthy difference between the average age at death of the non-Hispanic white population and the Hispanic population. A difference in which on average the non-Hispanic white population outlived the Hispanic population by 14.3 years. Another notable finding was the average age at death between the sexes. Females were seen to reach an average age of 77.5 years whereas males only reached an average age of 71.4 years. Finally, another outstanding difference was found when investigating leading cause of the death among the sexes. Chronic Lower respiratory Disease was one of the leading causes and one which had the greatest disparity between the two groups. On average men died due to chronic lower respiratory disease at an age of 55.3 whereas females reached an average of 63.3 years old.

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Announcements

Item 1. Preliminary Birth Report Issued

The Bureau of Epidemiology and Public Health Informatics has released *Preliminary Birth Report, Kansas, 2021*. As of April 1, 2022, KDHE’s Office of Vital Statistics had recorded 34,696 births to Kansas resident mothers in 2021, an increase of 1.0 percent from 34,368 births in 2020. The birth rate remained unchanged from 2020, at 11.8 births per 1,000 Kansas residents. This is the lowest birth rate for Kansas residents since the state created a centralized Vital Records system in 1911. Births to teen mothers decreased from 5.1 percent of live births in 2020 to 4.7 percent in 2021; counts also declined, from 1,749 in 2020 to 1,615 in 2021. Counts and rates presented in the Kansas Annual Summary of Vital Statistics, 2021 may be slightly higher, due to births that may be reported for Kansas residents who gave birth in other states. The full report is available at <https://www.kdhe.ks.gov/DocumentCenter/View/23194/Preliminary-Birth-Report-2021-PDF>. For further inquiry about additional data needs, call (785) 296-8627.

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