

INTRODUCTION

Adverse Childhood Events, or ACEs, are potentially traumatic experiences that occur during adolescent years that may have a long-lasting effect on health and well-being. ACEs include events involving emotional, physical, sexual abuse, and other events that may have a significant impact on one's adolescence such as parental separation/divorce, incarceration of a family member, neglect, and mental illness or substance dependence in the household. ACEs were defined in 1998 by the groundbreaking Kaiser Permanente-CDC study that revealed strong correlations between extent of ACEs in childhood and several risk factors for multiple of the leading causes of death in adults [1]. Since then, ACE research has grown drastically, some proving that ACE prevalence is not uniformly distributed and may be predictable based on demographic factors such as sex, race, and education.

ACE research in the state of Kentucky remains limited. Kentucky has proven to be a high prevalence state for ACEs but little is known about the regional demographic landscape of those that experience ACEs, and most importantly, what populations are affected at a disproportionately high rate. Acknowledging the scarce research done on ACEs in Kentucky, the prevalence of ACEs across different demographics among patients treated by the UK HealthCare system was analyzed.

PURPOSE OF STUDY

In this article, a descriptive study was conducted using data obtained from UK Healthcare, to review and summarize the demographics and types of ACEs found in pediatric patient populations receiving care in Kentucky (age range 0-17). The overall purpose of this study was to create a meaningful resource for pediatric providers in Kentucky to utilize when screening for ACEs in their patient populations.

METHODS

Data for this study was obtained through the University of Kentucky Center for Clinical and Translational Science (CCTS) Biomedical Informational Services. The study was conducted under the "honest broker" CCTS Enterprise Data Trust approved IRB (#45668). The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

A de-identified data set extraction was performed on individuals from the UK Healthcare database between the years June 2017 through June 2021. Inclusion criteria were individuals aged 0-17 years old with a BMI between 10-50kg/m² within the dates June 2017 through June 2021 that had at least one Z-code in their medical record. Exclusion criteria included prisoners, pregnant individuals, and BMI records outside the allotted range. Data collected from the records included ACE Z-codes and demographics.

After removing duplicate data and BMI records not within 10-50kg/m², the limited data extraction yielded n=5,118 unique individuals along with n= 6,020 unique observations. The SAS system was used to create a descriptive demographic summary of the data.

The data was grouped according to Z-code diagnosis. The median and range were found for BMI and age. Percentage distributions were calculated for race/ethnicity, gender, and insurance status. The mean, standard deviation, minimum and maximum were found for each subgroup of the demographics.

To analyze the sequence of ACEs for individuals with more than one, the Z-codes were ordered by appearance for each participant then a table was created to show the percentage of each Z-code for every step of the chronological sequence. Frequencies of Z-codes were found for each subgroup of the demographics.

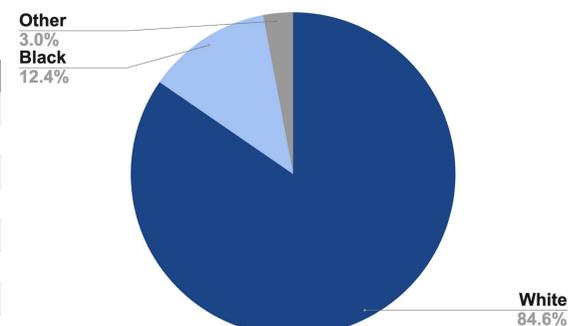
RESULTS

ACE & SDOH Description with their Codes

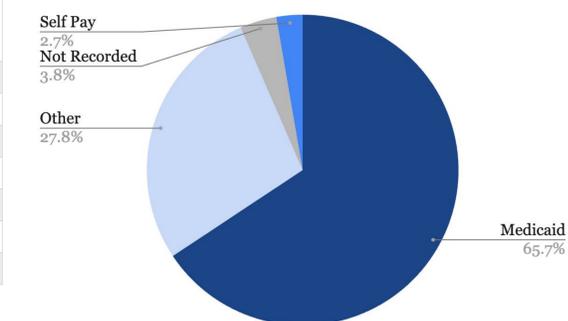
Z Codes	ACEs Description
Z62.81	Personal history of abuse in childhood
Z91.49	Other personal history of psychological trauma, not elsewhere classified
Z86.59	Personal history of other mental and behavioral disorders
Z81.8	Family history of other mental and behavioral disorders
Z62.21	Child in welfare custody
Z63.31	Absence of family member due to military deployment
Z63.71	Stress on family due to return of family member from military deployment
Z63.5	Disruption of family by separation and divorce
Z63.8	Other specified problems related to primary support (Family discord NOS, family estrangement NOS, high expressed emotional level within the family, inadequate family support, inadequate or distorted communication with family)
Z62.82	Parent-child conflict
Z63.72	Alcoholism and drug addiction in family
Z63.79	Other stressful life events affecting family and household
Z91.5	Personal history of self-harm
Z72.51	High risk heterosexual behavior
Z Codes	SDOH Description
Z59.4	Lack of adequate food and safe drinking water

School Based Health Alliance. Coding for Social Determinants of Health (SDOH) and Adverse Childhood Experiences (ACEs). June 2018. Accessed Nov 1, 2022. <https://www.sbhah.org/wp-content/uploads/2018/06/Coding-for-SDOH-and-ACEs.pdf> [1]

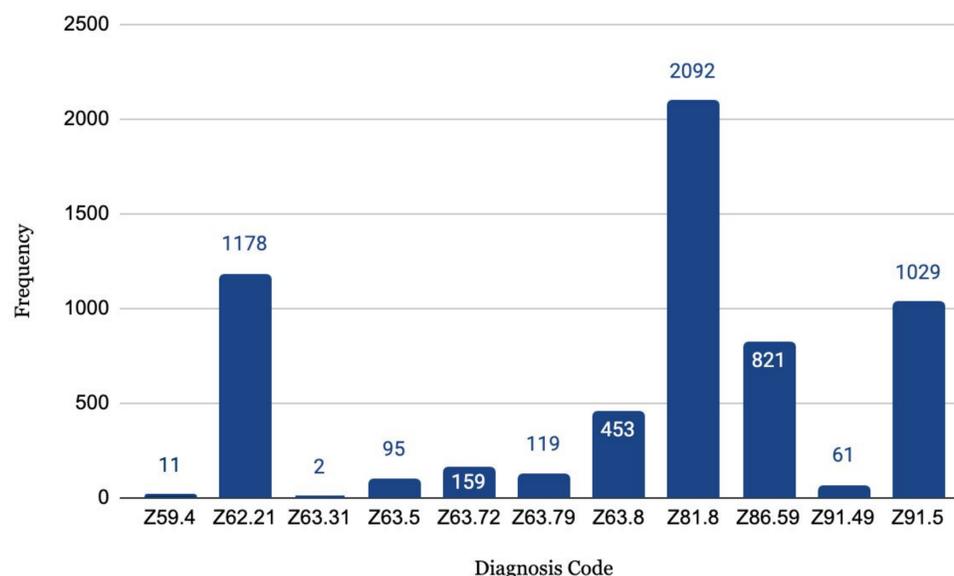
Z-code Percentages by Identifying Race



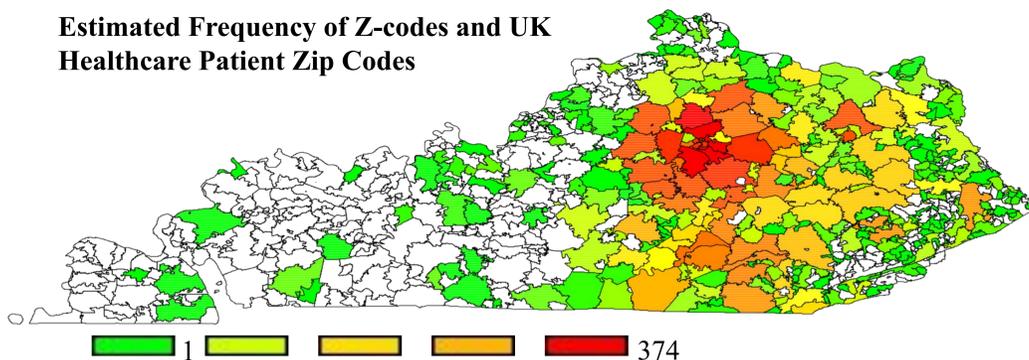
Z-code Percentages by Insurance Type



Frequencies of Z-codes at UK Healthcare Facilities



Estimated Frequency of Z-codes and UK Healthcare Patient Zip Codes



DISCUSSION

- The most frequently documented ACE code was "Family history of other mental and behavioral disorders," which raises questions regarding how family history is screened, as well as how predictive familial mental/behavioral disorders may be for a child's outcomes.
- "Child in welfare custody" was the second most documented, while "Disruption of family by separation or divorce" was used infrequently by comparison. This could be a reflection of how welfare custody is recorded for ACA insurance coverage, or that household disruptions are not documented with equal importance.
- A female was more likely to have an ACE than a male. Specifically, females were more likely to have codes for self-harm, household stress, and psychological trauma. Further study regarding whether higher rates of sexual abuse in females may play a role in this would be beneficial.
- Sequence wise, the two codes that stood out as most likely to be second visit diagnoses were psychological trauma and self-harm. If these codes are unlikely to be diagnosed initially, are they often a secondary outcome of previously documented adversities? Further study could improve awareness and prevention efforts for these diagnoses.

CONCLUSION

The significant variability in the data collected demonstrates that ACEs are present in every geographical, economic, and racial setting in Kentucky. The data found that on average the pediatric patients who were documented to have an ACE had only 1 Z-code, the most common being family member with a psychiatric disorder. These values are comparable to the national estimates for ACE experiences, although suggests further research must be done specifically on Kentucky's psychiatric health. [3]

Additionally, this project serves as a catalyst for **streamlining of ACE documentation and screening protocols**. In order to alleviate the ACE burden in Kentucky, healthcare providers must have an organized approach.

ACKNOWLEDGEMENTS

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REFERENCES



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