

ALBUMIN-BILIRUBIN (ALBI) SCORE AND SYSTEMIC IMMUNE-INFLAMMATION INDEXES USED AS PRETREATMENT OUTCOME PREDICTORS IN PATIENTS WITH PANCREATIC DUCTAL ADENOCARCINOMA UNDERGOING ROBOTIC OR OPEN WHIPPLE PROCEDURES

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INTRODUCTION

Pancreatic ductal adenocarcinoma (PDAC) is the most common type of pancreatic cancer (PC). In patients with resectable PC, identification of pretreatment biomarkers before surgery can help in the decision-making process by weighing the benefits of neo-adjuvant therapy, surgical procedure, and adjuvant therapy.

The purpose of this study was to determine if the albumin-bilirubin (ALBI) score and immune-inflammatory marker levels can be used in combination as pretreatment predictors of mortality risk in patients undergoing Whipple procedure.

METHODS

This retrospective study included patients with PDAC who underwent open or robotic Whipple procedures between January 2013 and December 2022 at a single tertiary medical center.

The albumin and total bilirubin (ALBI) score was calculated from two variables with the formula: ALBI score = $(-0.085 \times \text{albumin (g/dL)}) + (0.66 \times \log_{10} \text{total bilirubin (mg/dL)})$.

The systemic immune-inflammation index (SII) was defined as $\text{SII} = (\text{platelet} \times \text{neutrophil}) / \text{lymphocyte}$. The neutrophil lymphocyte (NLR) was calculated as: $\text{NLR} = \text{neutrophil} / \text{lymphocyte}$, and the platelet lymphocyte (PLR) was calculated as $\text{PLR} = \text{platelet} / \text{lymphocyte}$.

Logistic regression analysis was used to find the association between predictors and mortality. Machine learning algorithms were used to calculate the performance of the different models. Kaplan-Meier curves were calculated for the presurgical biomarkers associated with mortality.

TABLE 1: DESCRIPTIVE BASELINE CHARACTERISTICS OF SURVIVORS AND DECEASED PATIENTS

	Total (N=115) N (%)	Survivors (N=49) N (%)	Deceased (N=66) N (%)	p-value
Age, years, mean (SD)	66 (10.1)	67.3 (10.6)	65.6 (9.7)	0.4
Sex				
Female	46 (40)	15 (31)	31 (47)	0.08
Male	69 (60)	34 (69)	35 (53)	
Race/ethnicity				
Black	28 (24)	12 (25)	16 (24)	0.98
White	72 (63)	31 (63)	41 (62)	
Hispanic	15 (13)	6 (12)	9 (14)	
Type of procedure				
Robotic	76 (66)	36 (73)	40 (61)	0.15
Open	39 (34)	13 (27)	26 (39)	
Neo-adjuvant therapy				
Yes	19 (17)	7 (14)	12 (18)	0.6
No	96 (83)	42 (86)	54 (82)	
Baseline laboratories				
Bilirubin, mg/dL, median (min-max)	1.4 (0.2-25)	1.1 (0.2-14.2)	1.6 (0.3-25)	0.01
Albumin, g/dL, mean (SD)	3.7 (0.5)	3.9 (0.5)	3.5 (0.5)	0.0003
ALBI score, mean (SD)	-2.1 (0.6)	-2.4 (0.5)	-1.9 (0.7)	< .0001
SII, median (min-max)	738 (191-6799)	609 (208-6799)	909 (191-3408)	0.01
NLR, median (min-max)	3.3 (1-278)	2.6 (1.1-28)	3.9 (1-14.5)	0.003
PLR, median (min-max)	149 (69-613)	135 (69-613)	162 (75-588)	0.2

TABLE 2: PRE-PROCEDURAL PREDICTORS AND MORTALITY

Variable	Odds Ratio	95% CI	P-value
ALBI group			
≤-2.24 (low)	Ref		
>-2.24 (high)	4.3	1.8-10.3	0.0008
NLR group			
≤3.5 (low)	Ref		
>3.5 (high)	3.3	1.4-7.9	0.007
Sex			
Female	2.6	1.1-6.4	0.03
Male	Ref		

RESULTS

ALBI score >-2.24 (OR = 4.3, 95% CI = 1.8-10.3, $p = 0.0008$), NLR >3.5 (OR = 3.3, 95% CI = 1.4-7.9, $p = 0.007$), and being a woman (OR = 2.6, 95% CI = 1.1-6.4, $p = 0.03$) remained influential predictors of increased mortality (Area under curve or c-value = 0.77).

Patients with an ALBI score ≥ -2.24 and NLR ≥ 3.5 were grouped as the “high ALBI and NLR” group, while patients with an ALBI score <-2.24 and NLR <3.5 were grouped as the “low ALBI and low NLR” group.

Patients with a combination of high or low ALBI or NLR were grouped as the “high or low any group.”

The median survival time was >25 months (95% CI = 22- ∞) in the “low ALBI and low NLR” group, 22.7 months (95% CI = 15-33) in the “high or low any group,” and 15 months (95% CI = 10-22) in the “high ALBI and NLR” group.

DISCUSSION

In one investigation, Whipple patients with high ALBI grade (>-2.6) and high CA 19-9 (>35 U/mL) exhibited a considerably lower five-year survival rate (13.8%) compared to those with low ALBI grade (<-2.6) and low CA 19-9 (<35 U/mL) (43.3%). Another study reported a significant difference in median survival time between high and low ALBI score patients. Our analysis found that patients in “low ALBI and low NLR” group had a higher survival rate. There is no literature that combines ALBI and NLR to predict mortality.

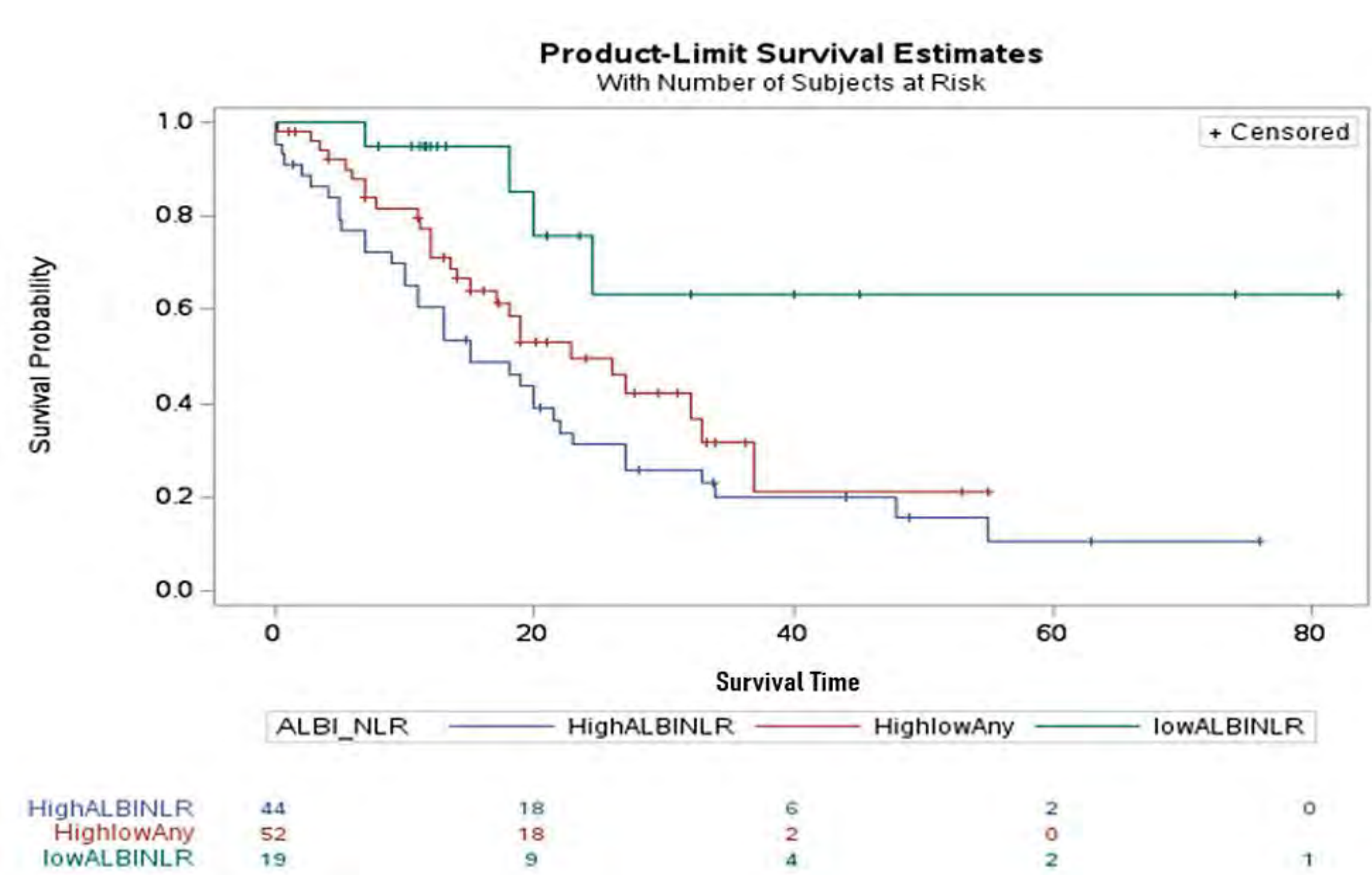
CONCLUSIONS

The ALBI score and the NLR are easily accessible markers; their use, combined with a patient’s sex, can provide useful pre-surgical information regarding mortality risk after Whipple. This can aid in treatment planning as well as expedite decisions about the type of Whipple procedure, adjuvant therapy, and surveillance, which can subsequently improve a patient’s outcomes and survival.

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FIGURE 1. KAPLAN-MEIER CURVES FOR THE ALBI SCORE AND NLR GROUPS





Introduction

Access to care and neighborhood factors may impact maternal postpartum readmission facility location and timing. Neighborhood socioeconomic disadvantage was assessed using the Area Deprivation Index (ADI), which is validated for census block groups.¹ ADI is a multidimensional evaluation, based on the American Community Survey demographic data, that uses factors related to employment, housing quality, and income to quantify the socioeconomic status of neighborhoods (1-10, with higher score indicating disadvantages).² Hypertension-related complications account for most postpartum readmissions.³

The Dallas-Fort Worth area has a Hospital Council that houses a database of hospital admissions for the area. Facilities provide de-identified individual patient data for all hospital encounters, including birth and postpartum readmission.

Objectives

The objective of this study was to determine if ADI is associated with readmission hospital location and timing of readmission for a hypertension-related complication within the first 12 weeks of delivery in an urban region.

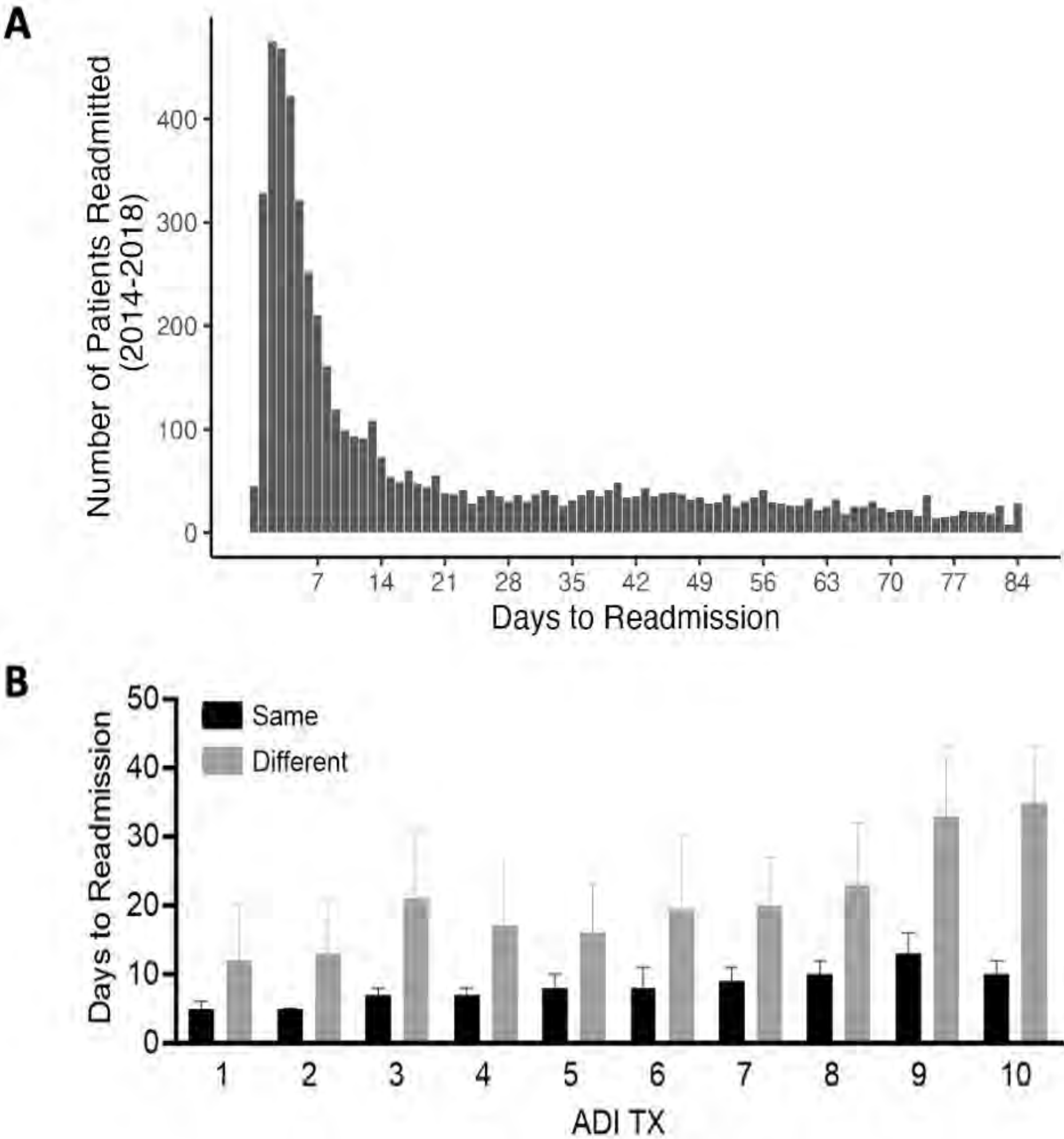
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Materials and Methods

- The Dallas-Fort Worth Hospital Council Database was queried for postpartum readmission
- Inclusion criteria:
 - Patients who delivered a live-born infant from 2014-2018 and had a postpartum readmission for a hypertension disorder within 12 weeks of delivery
 - Only the first hypertension readmission
- Hypertension disorder classified by the ICD-9 and ICD-10 codes⁴
- Patients were linked to the ADI score by their census tract
- The ADI for individuals readmitted to a different hospital was compared to those readmitted to the same hospital where they gave birth
- Trends associated with patient ADI were compared for those readmitted to the same hospital to those readmitted to another facility
- Statistical analysis was performed on GraphPad Prism
 - Chi-squared was used for association of hospital readmission location and ADI
 - The trend analysis was by Mann-Kendall.
 - Data are presented as median with 95% CI

Results



475,865 deliveries:

- 5,471 (1.1% of deliveries) had at least one readmission for a hypertension disorder
- 4,037 (74%) were readmitted to the same hospital where they gave birth
- 1434 (26%) patients were readmitted to a different hospital

Figure 1A: The distribution of the readmission data is skewed right: most hypertension readmissions occur within the first week

Figure 1B: There was a significant association between ADI and hospital readmission location

- Irrespective of ADI, patients receiving care at a different hospital were readmitted later than those readmitted to the same hospital ($p<0.001$)
- A higher ADI was associated with a readmission to a different hospital and these patients were readmitted later in the postpartum period ($p=0.005$)
- Patients linked to an ADI of 10 present to a different hospital 2.9 times later than patients linked to an ADI of 1 ($p<0.001$)

Conclusions

- Nearly 1 in 4 postpartum patients requiring readmission for postpartum hypertension were admitted to a hospital other than their delivery hospital.
- As measured by ADI, socioeconomic disadvantage was associated with an increased likelihood of readmission to a different hospital and a later timing of readmission.
- Untimely hypertension treatment increases the risk of morbidity and mortality.
- This highlights the need to better understand the socioeconomic barriers patients experience and a critical need to understand how to promote access to postpartum care.



LIFESAVING LITERACY: EDUCATING PROVIDERS AND PATIENTS TO REDUCE MATERNAL MORTALITY

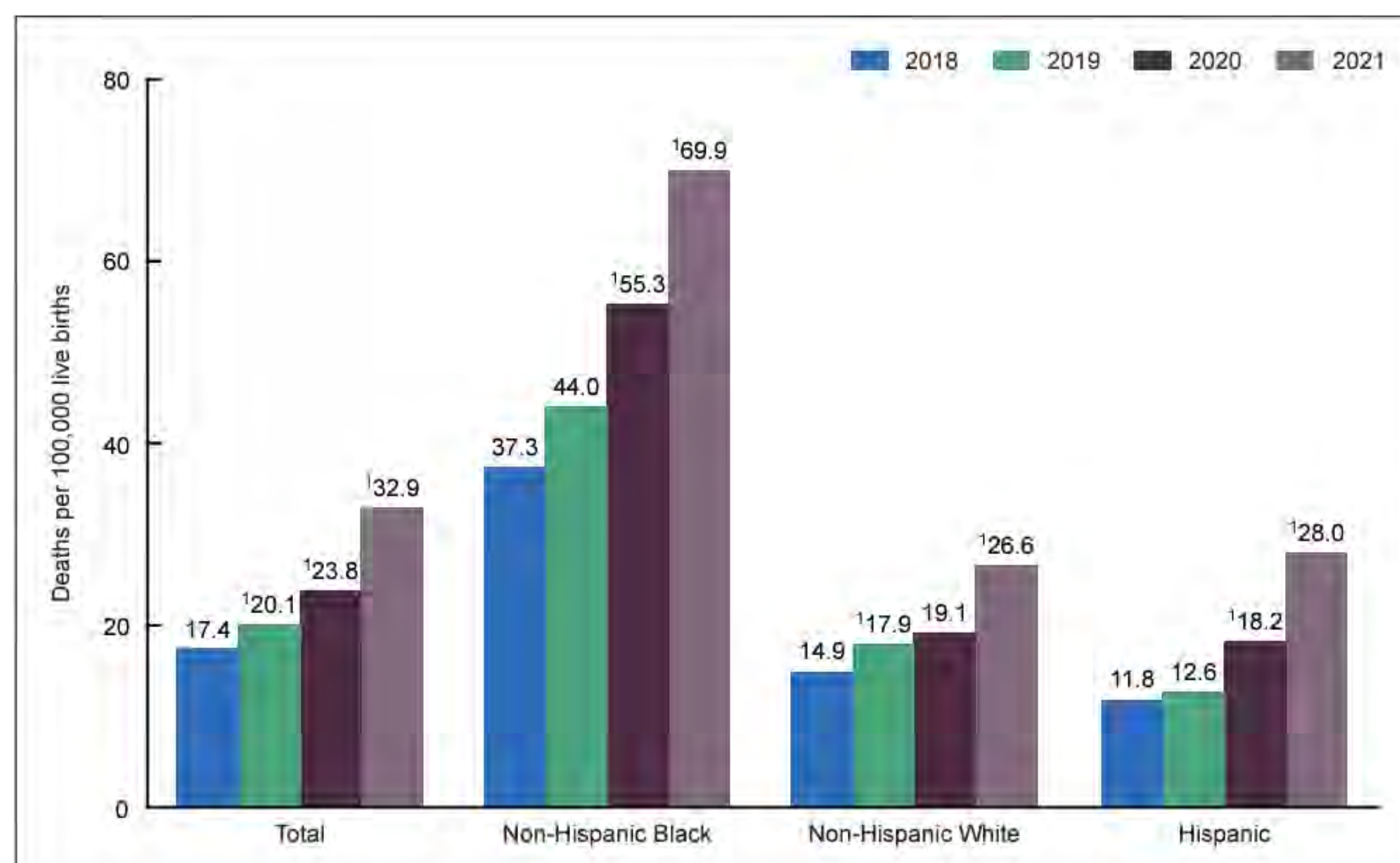
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BACKGROUND

The United States (U.S.) reported a staggering increase in pregnancy related deaths from 2019 to 2021, reporting fatalities of 745 to 1,205, respectively (Hoyert, 2023). An increase of maternal mortality has been seen in categories of race and age, as non-Hispanic Black women are 2.6 times more likely to die during pregnancy compared to their non-Hispanic White counterparts (Hoyert, 2023). Pregnancy-related deaths in the U.S. are higher for non-Hispanic Black women, which stems from complicated pregnancies (e.g., preeclampsia, fetal abnormalities), pre-existing comorbidities (e.g., hypertension, diabetes), and clinical interventions.

Figure 1

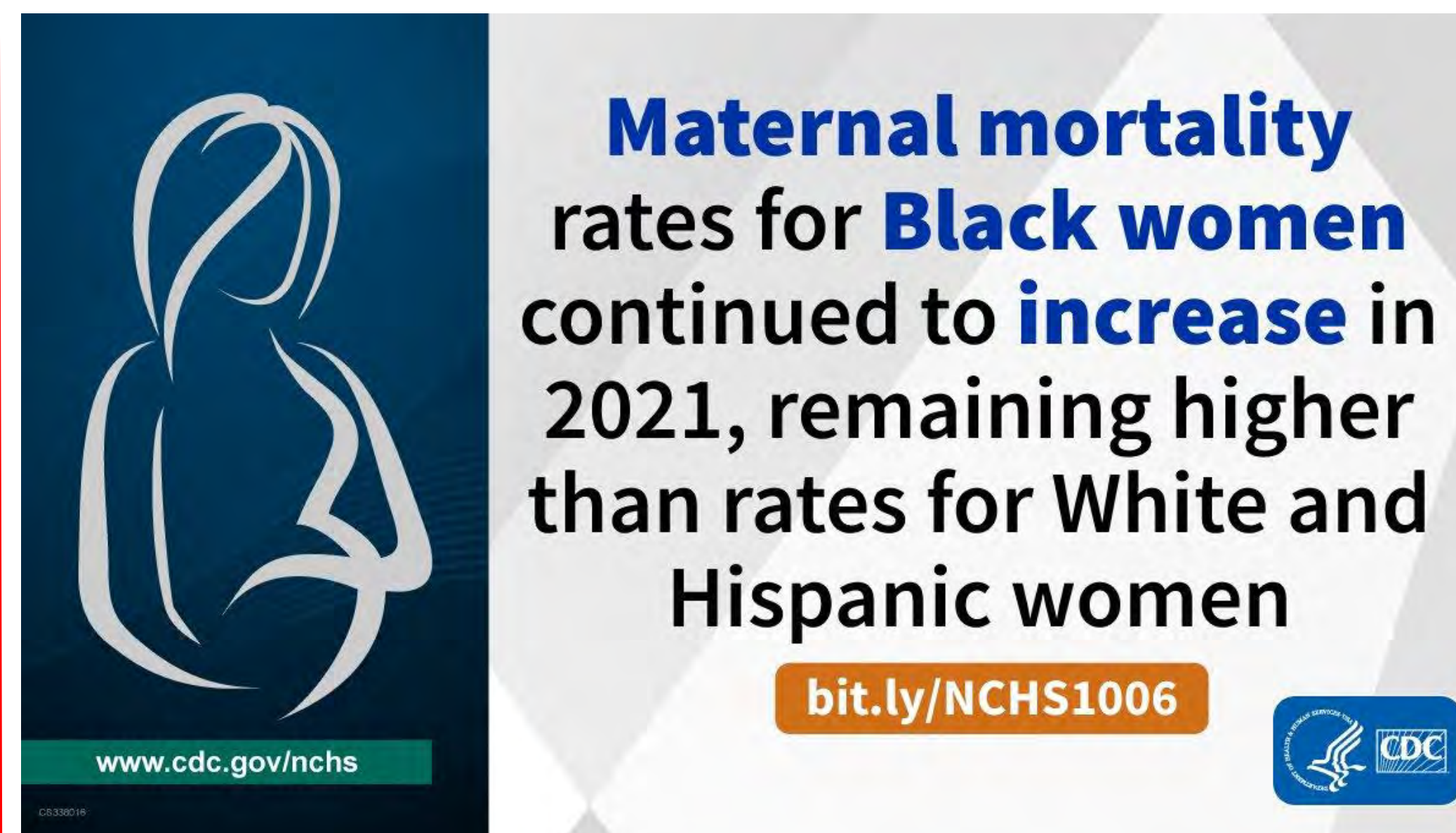


An increase of maternal mortality rate by race and Hispanic origin from 2018-2021. (Hoyert, 2023, March)

AIM

To improve the quality of patient-care outcomes and to promote maternal health and wellbeing by increasing health literacy for healthcare professionals and patients.

Figure 2



Black women have faced an increase in maternal mortality in 2021. (Centers for Disease Control and Prevention, 2023, March)

KEY FINDINGS

1. Implicit bias training should be incorporated into healthcare educational and training programs to provide high-quality healthcare experiences to diverse populations. Prevention strategies need to be researched to reduce disparities in all maternal stages (Saluja & Bryant, 2021).
2. Race and ethnicity are key factors of the U.S. maternal mortality economic strain. Public health officials should focus their policies on reducing maternal mortality and closing the disparity gap (White et al., 2022).
3. Amid the COVID-19 pandemic in August 2020, the CDC launched its Hear Her campaign to raise awareness of urgent maternal warning signs to improve communication between patients and healthcare providers (CDC, 2023)

STRENGTHS & LIMITATIONS

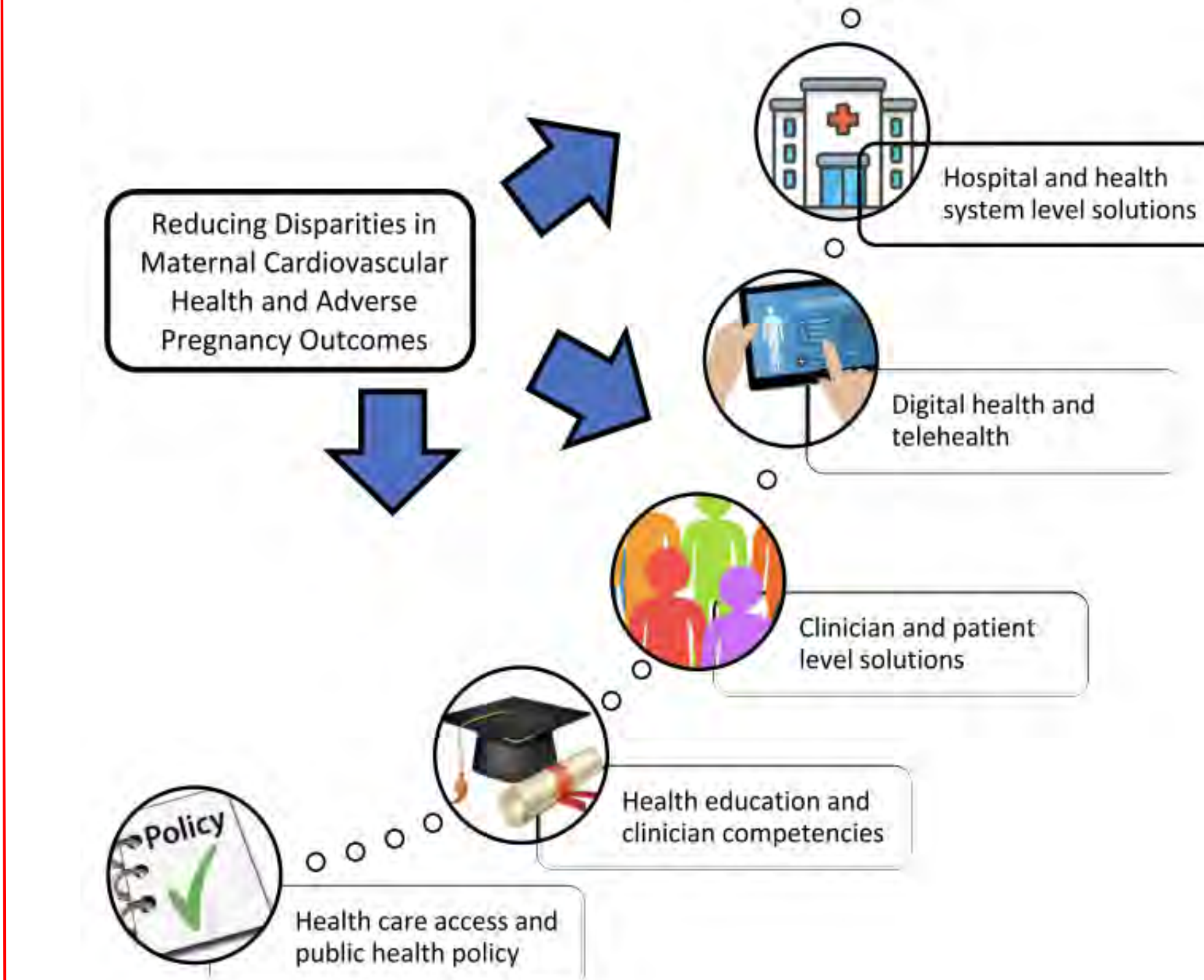
Strengths:

- Disparities, such as racial discrimination, implicit biases, income, and maternal care competency increase the chance of medical errors and death in maternal care.
- Proven gaps in maternal care conveyed by lack of health literacy, education, and equitable clinical interventions.

Limitations:

- Data collected was between 2018-2021, which the COVID-19 pandemic could have impacted current data.

Figure 3



Different solutions to reduce disparities in maternal outcomes. (Shah et al., 2021, December)

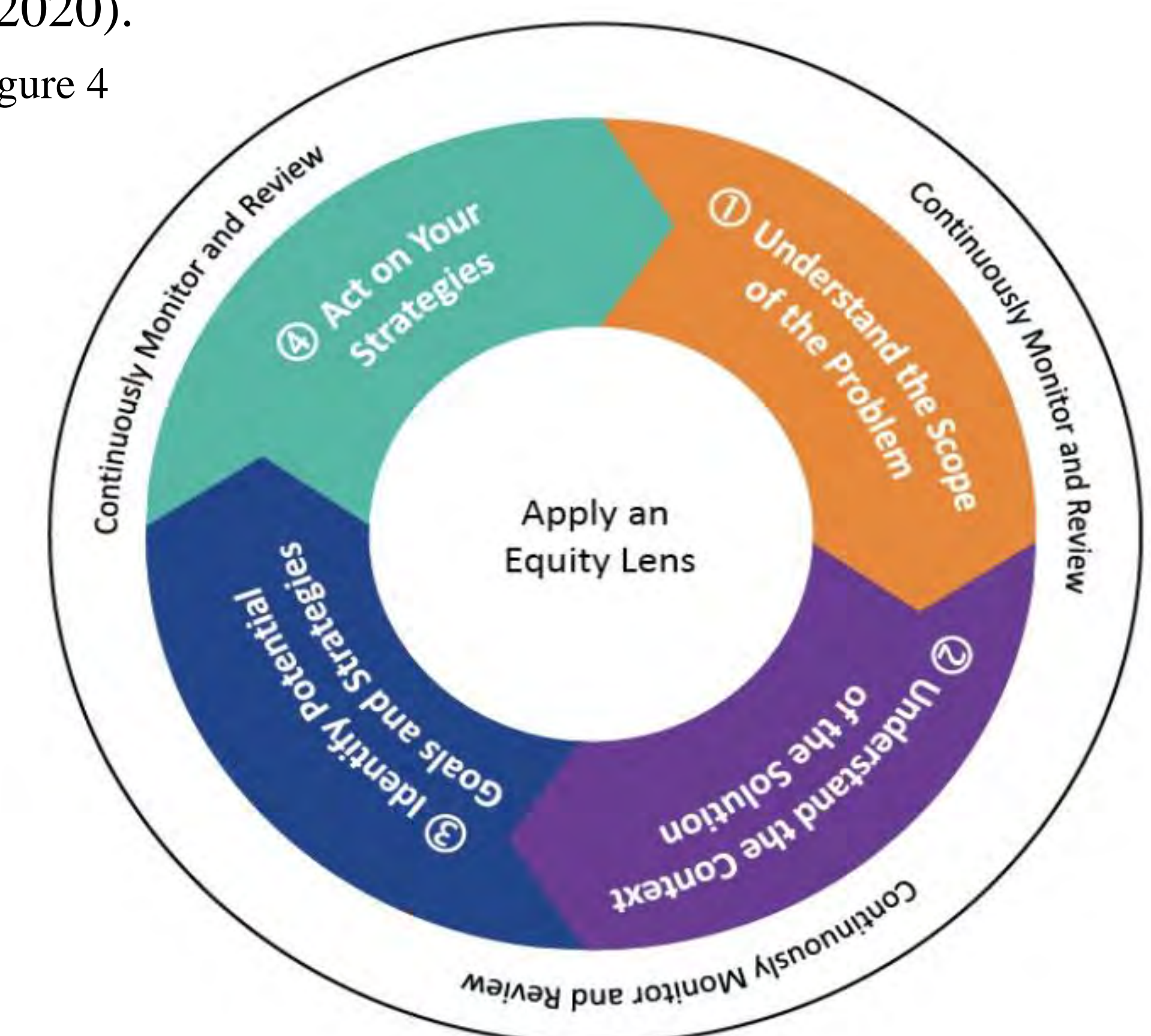
Future Research

- Investigating causations of social determinants of health through systematic levels in maternal mortality by advocating programs in health literacy and cultural humility for non-Hispanic Black women..

CONCLUSION

- Maternal mortality has consistently, and unfortunately, increased from 2019-2021 in the United States, especially non-Hispanic Black women.
- Instituting a training program with medical professionals can improve patient outcomes and lower maternal mortality before, during, and immediately following pregnancy (Allen, 2020).
- With patient education, access to quality reproductive health for women of color and low socioeconomic status resulted in decreased maternal mortality (Ahn et al., 2020).

Figure 4



Maternal Mortality Review Committees (MMRCs) installing state strategies to combat maternal mortality through 4 conceptual steps in the focus of health equity. (Centers for Disease Control and Prevention, 2022, June 15)

ACKNOWLEDGEMENT & REFERENCES



Impact of Smoking Cessation Interventions on Internal Medicine Clinics at a Large Academic Medical Center

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Background

According to the CDC, smoking tobacco is estimated to be responsible for 1 out of 5 deaths in the United States and the leading cause of preventable death. The CDC also notes that smokers who quit before age 40 have a 90% lower risk of death from smoking related disease

In fiscal year 2022, there were over 1,500 new patients in the UT Southwestern Department of Medicine (DOM) who were active smokers. However, only 130 patients (~8.4%) had counseling documented or a referral placed for the Nicotine Cessation Program (NCP)

Aim Statement

For new patients seen within DOM clinics identified as active smokers, we sought to increase tobacco cessation counseling or NCP referral rates from baseline 8.4% to 11.4% (tier 1) and then to 14.4% (tier 2) over a 12-month period (August 2022-September 2023)

Quality Improvement Interventions

- August 2022:
 - Email sent to the Division and Clinical Chiefs informing them of the new smoking cessation metric for Fiscal Year 2023
- November 2022:
 - Started emailing monthly Quality Improvement (QI) newsletter to all clinic leadership, medical directors, and division chiefs updating them on the current metric performance
- December 2022:
 - Created Infographic (Figure 2) to provide education on the QI metrics and how to meet them through a potential clinic staff driven workflow - distributed to all clinic leadership
- January 2023:
 - Outreach at faculty meetings of several divisions informing them of the QI metrics and how to meet them
- February 2023 and beyond:
 - Continue to provide feedback to the DOM clinics on their performance

Figure 2 (below): Infographic developed for education on the QI metrics and how to meet them



Analysis and Results

Figure 1 (below): Smoking cessation counseling or NCP referral rates for new patients to the DOM who are smokers, tabulated monthly

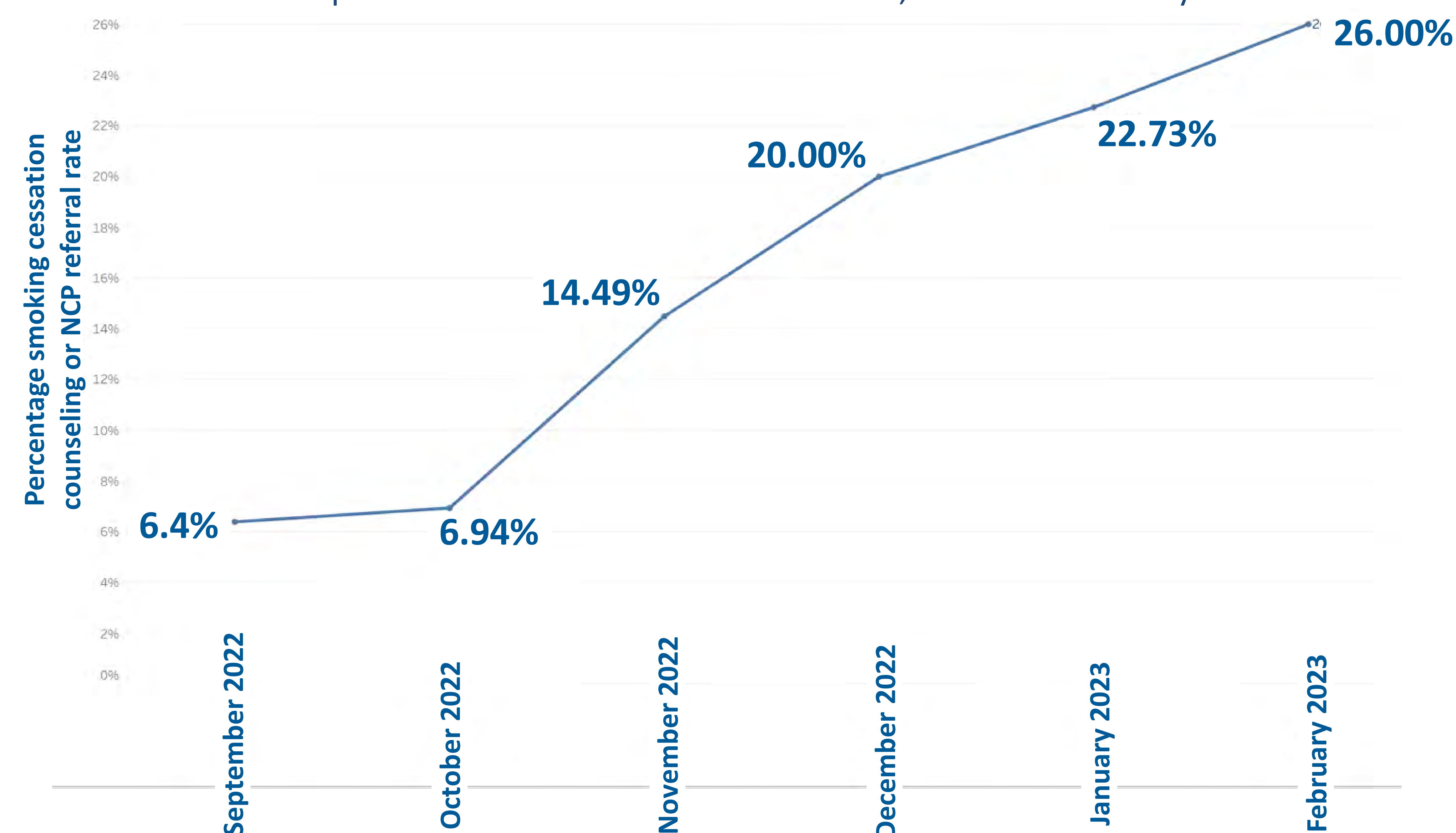
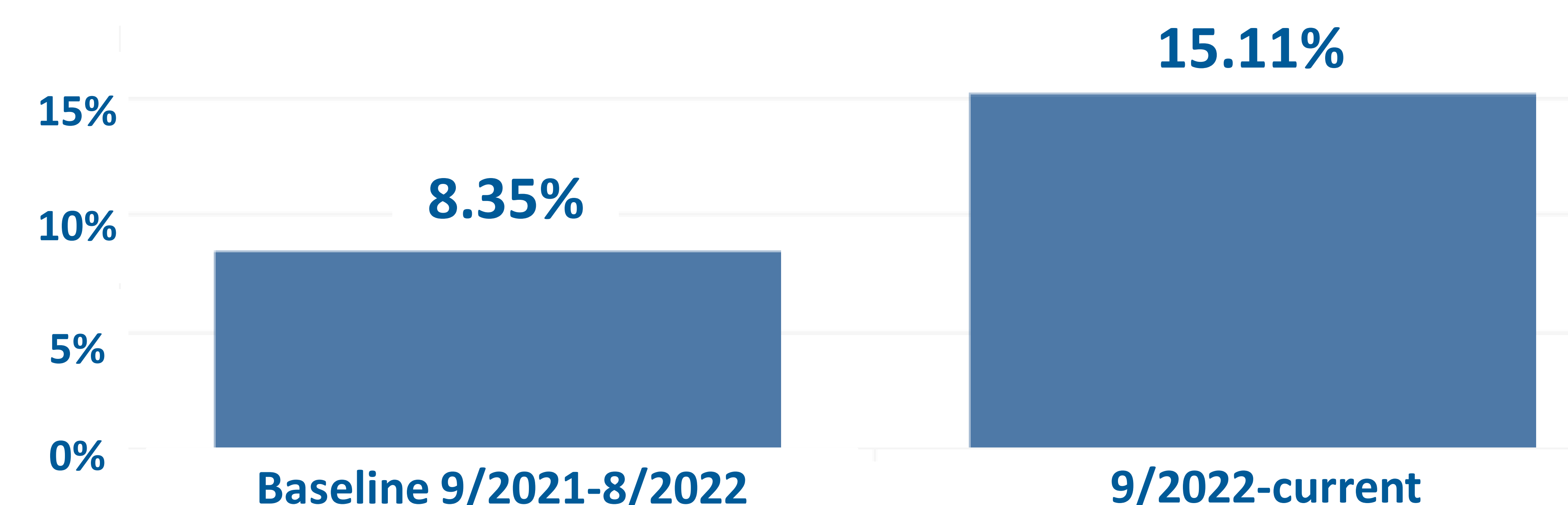


Figure 3 (right): The metric rate increased from baseline of 8.4% in August 2022 to 15% in January 2023 - Tier 2 goal met within the first few months



Conclusions and Future Initiatives

- Our interventions and the approach through a potential clinic staff driven workflow (avoiding additional use of provider time) was successful in increasing smoking cessation counseling or NCP referral rates and we met our tier 2 goal within the first five-month period
- Setting new and higher metrics for counseling and referrals
- Further investigation needed regarding patients who followed through with tobacco cessation
- Reach out to individual clinics to improve performance

References: CDC. *Fast Facts and Fact Sheets*. July 2022. Funding: None

IMPACT OF TRANSFUSION THRESHOLD REDUCTION FOR BONE MARROW TRANSPLANT PATIENTS

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Tracine Adame, BSN, RN, CPHQ, LSSGB



Introduction

Patients undergoing Bone Marrow Transplants (BMT) often require numerous transfusions throughout their treatment.

The ability to limit transfusion burden in the BMT patient population while maintaining patient safety is both highly important and limited in its evaluation.

Background

A meta-analysis, published in The American Journal of Medicine, concluded that restricting blood transfusions to patients with a hemoglobin (HGB) less than 7 g/dL resulted in a significant reduction in total mortality, acute coronary syndrome, pulmonary edema, re-bleeding, and bacterial infection, compared with a more liberal transfusion strategy. (Salpeter, Buckley, & Chatterjee, 2014)

In addition, DeZern et al. (2016) established the feasibility for lower transfusion thresholds in the acute leukemia population without increased safety risk.

Clinical Question

Does lowering the RBC transfusion threshold for BMT patients impact patient outcomes?

- Length of stay (LOS)
- Mortality rates
- Readmission rates
- ICU admission rates
- Patient falls post discharge.

Methods

As a result of blood conservation efforts during the COVID-19 pandemic, the red blood cell (RBC) transfusion threshold was lowered for patients at Medical City Dallas seeking BMT. This change took place in March of 2020. The transfusion threshold for BMT patients was changed from 1 unit RBC for a **HGB < 8 g/dL** to 1 unit RBC for a **HGB < 7 g/dL**. All other treatment was provided according to standard of care.

Quantitative non-inferiority analysis of previously collected data was used to compare patient outcomes.

A total of 206 BMT patients are included in the data set. They were evenly split - 103 pre-threshold change and 103 post-threshold change.

Results

Figure 1

BMT Type	Pre-Threshold Change	Post-Threshold Change
Autologous	61 (59.2%)	61 (59.2%)
Allogeneic Related	19 (18.4%)	10 (9.7%)
Allogeneic Unrelated	16 (15.5%)	26 (25.2%)
Allogeneic RH	7 (6.8%)	6 (5.8%)

*From these values it can be seen that the only change in transplant types is reflected in an uptick of Allogeneic Unrelated type transplants after the threshold change coupled with a corresponding decrease in Allogeneic Related transplants.

Figure 2

	Pre-Threshold Change	Post-Threshold Change
# BMT patients	103	103
Average LOS	25.2 days	26.8 days
SD	11.1	13.9
Median	22	23
(rank sum test $p = .054$, normal scores test $p = .079$)		
Pre-Transfusion HGB	n=92	n=85
AVG	7.7	7.2
SD	0.44	0.71
Median	7.5	6.8
(F=2.60, $p < .001$)		
Mortality		
No	91 (88.4%)	87 (84.5%)
Yes	12 (11.7%)	16 (15.5%)
($\chi^2 = 0.66$, exact one-sided $p = .271$)		
Readmission Rate		
No	81 (78.6%)	83 (80.6%)
Yes	22 (21.4%)	20 (19.4%)
($\chi^2 = 0.12$, exact one-sided $p = .569$)		
ICU Admission Rate		
No	96 (93.2%)	93 (90.3%)
Yes	7 (6.8%)	10 (9.7%)
($\chi^2 = 0.58$, exact one-sided, $p = .307$)		

*The LOS data was extremely skewed to the right (asymmetrically distributed) with extreme outliers on the high end.
*29 patients had no pre-transfusion HGB documented.

Figure 3

BMT Type	Pre-Threshold Change	Post-Threshold Change
Autologous (AVG LOS)	(n=61) 21.4 days	(n=61) 23.2 days
Allogeneic (AVG LOS)	(n=42) 30.7 days	(n=42) 32 days
(p = .186)		

Results

BMT patients had a mild average statistical increase in LOS of 1.6 days (Figure 2) after the RBC transfusion threshold was lowered.

No statistical differences were found in mortality, readmission rates, or ICU admission rates as a result of the lower threshold (Figure 2).

*Only one patient had a fall after discharge, so this research question could not be analyzed.

There was an increase in Allogeneic Unrelated transplants after the threshold change (Figure 1). No difference ($p = .186$) was found when comparing LOS between the BMT types before/after the threshold reduction (Figure 3).

*Statistical analysis was completed by Greg Miller, PhD

Conclusion / Implications

The statistical evidence provided indicates that the answer to the question, **“Does lowering the RBC transfusion threshold for BMT patients impact patient outcomes?”** is **“No”**.

There was no change in patient outcomes as a result of this initiative.

Future studies could explore outcomes related to disease type and overall blood utilization before/after the threshold change. These data elements were collected but not analyzed for this study.

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Salpeter, S. R., Buckley, J. S., & Chatterjee, S. (2014). Impact of more restrictive blood transfusion strategies on clinical outcomes: a meta-analysis and systematic review. *The American journal of medicine*, 127(2), 124-131

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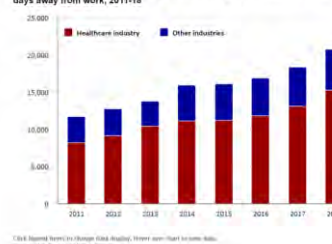


Background

- Workplace Violence is a public health issue, particularly in healthcare

- Violent events are on the rise

Chart 2. Number of nonfatal workplace violence injuries and illnesses with days away from work, 2011-18



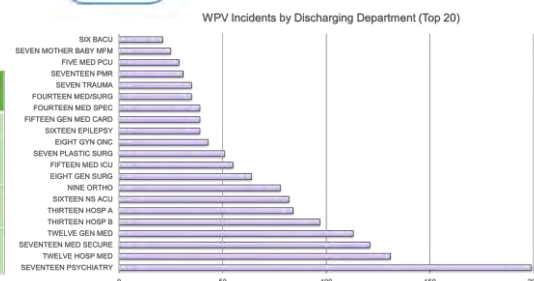
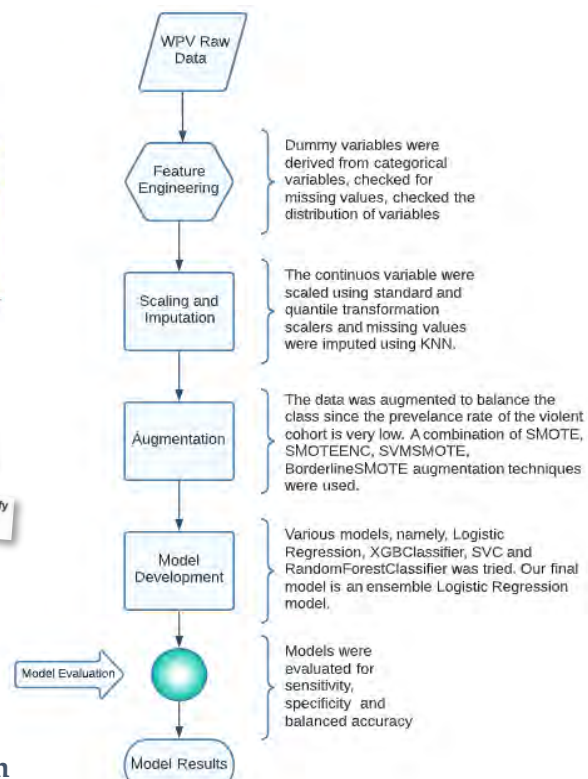
Project Aim

- Create an AI/ML Predictive Model to identify if a patient will become violent during their inpatient visit at Parkland Health

Data Setup

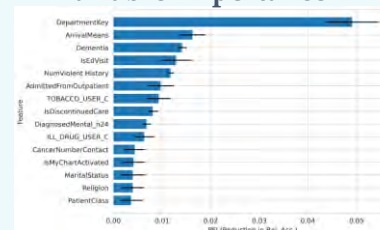
	Date Range	Rows	Columns	Prevalence
Internal Data	10/1/2017 – 10/1/2022	299,692 encounters from 157,162 patients	157 features per encounter	2.095 or 0.70%
External/ Silent mode Data	10/1/2022 – 8/23/2023	48,298 encounters from 36,192 patients	157 features per encounter	459 or 0.94%

Approach



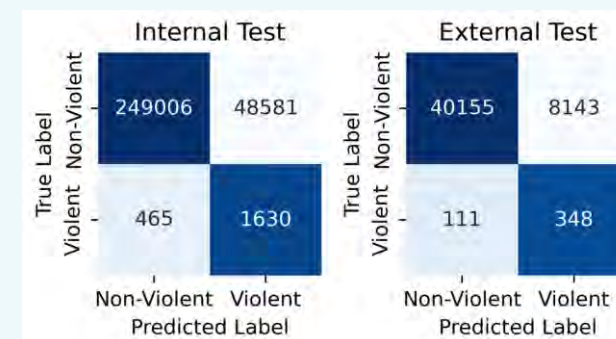
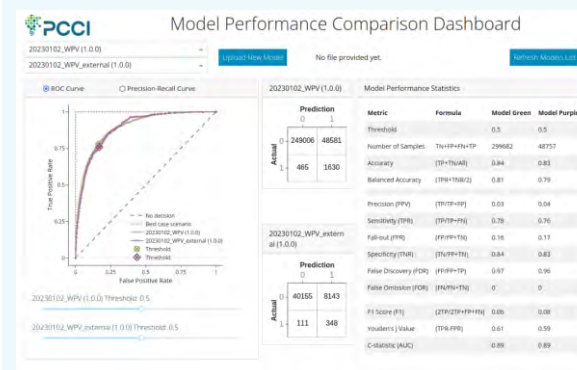
Results

Variable Importance

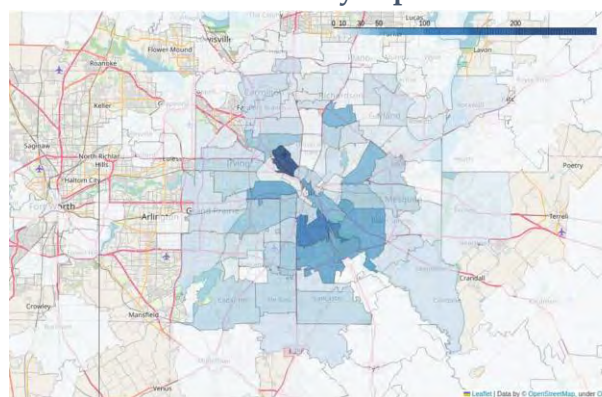


For every 1000 admitted encounters (~1 week at Parkland):

- 7.1 violent events correctly predicted (true positive)
- 2.3 violent events missed (false negative)
- 167 false alerts (false positive)
- 823 correctly predicted non-violent encounters (true negative)



Patient Violent Events by Zip - Dallas County



Conclusions and Implications

- This predictive model is being piloted at Parkland Health in a few departments along with other tools such as the BROSET tool
- Early detection of potential violent events can lead to safety precautions and avoidable injury

Acknowledgements:
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Predicting suicide and intentional self harm risk among high-risk emergency department patients in safety-net healthcare systems: A novel machine learning model

Joydeep Sarkar, Abhijit Ghosh, ShaoMin Liu, Bruno Martinez, Kari Teigen, John Rush, James-Michael Blackwell, Sajid Shaikh, **Cynthia Claassen**

Background & Aims

Background: Safety net healthcare systems’ emergency department (ED) patient populations are known to have a markedly elevated risk of near-term suicidal acts and intentional self harm (ISH). However, predicting risk in this population is particularly challenging because this patient group has a high prevalence of known baseline risk factors (e. g. reduced healthcare access, economic instability, limited social support, mood and psychotic disorders, etc.), making traditional risk assessment methods less helpful than they might be in other settings. Point-of-care predictive models that increase accuracy in identifying ED patients at near-term risk of such behaviors could facilitate more judicious allocation of resources designed to prevent fatal and non-fatal suicidal and ISH acts. However, characterization of risk -- even within populations known to have the greatest risk density -- remains a work in progress.

Study Aims:

1. Using JPS electronic medical record (EPIC) data, to develop suicide risk prediction models specifically designed for ED populations with a higher density of risk factors.
2. To ensure that the new models provide understandable, actionable, point-of-care insights regarding risk of near-term suicidal acts at the individual patient level.

Methods

Outcome variable: Suicide attempt or death occurring within 30 days after an index visit to the JPS Health Network’s psychiatric emergency center (PEC),

Data Sources: 1) 2018-2019 structured and unstructured PEC data from EPIC; 2) structured data from 80 area EDs surrounding JPS extracted the DFW Hospital Association database to identify JPS patients treated elsewhere for nonfatal suicidal acts; 3) Tarrant County Medical Examiner death database.

ED-treated ISH events were identified using ISH-related ICD-10 codes and / or manual record review (JPS system only). A total of 12879 ISH events were identified within the study cohort using these methods.

Methods (Cont.)

The models include a total of 213 variables.

A total of 15,987 individual patients were included in the study. Cumulatively, 29.66% of these patients experienced a suicidal or ISH event at some point within the study timeframe, with 8.63% experiencing more than one such event.

The following table illustrates the distribution of patient demographics in Train/Test/Holdout-Validation datasets.

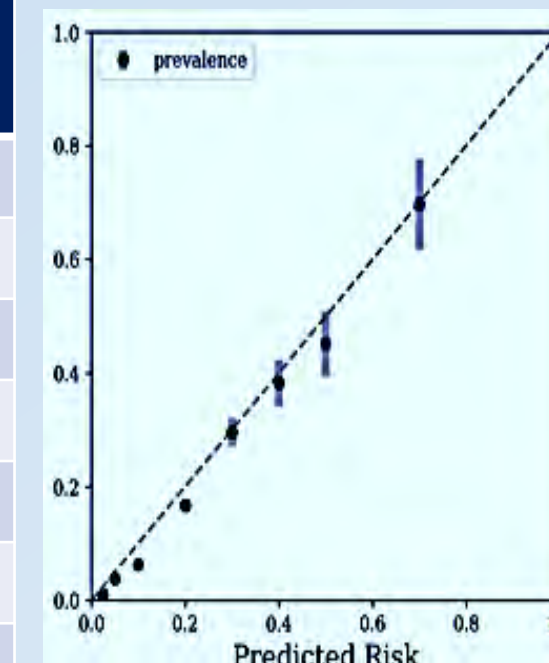
	Study cohort (N = 15987)	Training (N = 9610)	Test (N = 3189)	Holdout-Val (N = 3188)
Gender (N%)				
Male	8460 (52.92%)	5086 (52.94%)	1691 (53.03%)	1683 (52.79%)
Female	7525 (47.08%)	4522 (47.06%)	1498 (46.97%)	1505 (47.21%)
Race (N%)				
White	9350 (58.49%)	5610 (58.38%)	1873 (58.73%)	1867 (58.56%)
Black	4399 (27.52%)	2643 (27.5%)	879 (27.56%)	877 (27.51%)
Asian	190 (1.19%)	115 (1.2%)	37 (1.16%)	38 (1.19%)
Other	1884 (11.78%)	1137 (11.83%)	372 (11.67%)	375 (11.76%)
Multi	164 (1.03%)	105 (1.09%)	28 (0.88%)	31 (0.97%)
Ethnicity (N%)				
No Latino	13486 (84.38%)	8092 (84.23%)	2701 (84.7%)	2693 (84.53%)
Latino	2496 (15.62%)	1515 (15.77%)	488 (15.3%)	493 (15.47%)
Age	36.97 ±13.78	36.99 ±13.73	36.89 ±13.82	36.99 ±13.86
Income (N%)				
Above 40k	7560 (47.29%)	4488 (46.7%)	1561 (48.95%)	1511 (47.4%)
Below 40k	4411 (27.59%)	2712 (28.22%)	855 (26.81%)	844 (26.47%)
Below 25k	4016 (25.12%)	2410 (25.08%)	773 (24.24%)	833 (26.13%)
Education	48.17 ±8.51	48.14 ±8.54	48.21 ±8.49	48.2 ±8.47

Methods (Cont.)

Analytic Approach: Data were split into 3 groups (Train, Test, Holdout-Validation sets at the patient level; Kaplan Meier structural equivalence p = 0.51).

A sliding window (time horizon) method was used to develop a machine learning (ML) based classification model for stratifying risk of either fatal or nonfatal intentional self-harm at the patient encounter level. Specifically, longitudinal patient trajectories were converted into sliding time horizon windows using a six-month pre-encounter observation window and 30-day and 90-day post-visit prediction windows. A total of 51,906 different time horizon “scenarios” were identified in the data, and predicted risk was calculated for each patient by fitting their risk pattern at the point of care to the best-fitting time horizon “scenario.”

Bin of Predicted Risk (%)	Mean Predicted Risk	Prevalence of real ISH events	Number of scenarios
(0, 2.5)	1.12%	1.01%	43627
(2.5, 5)	3.43%	3.83%	4668
(5, 10)	6.81%	6.34%	2016
(10, 20)	13.72%	16.68%	1031
(20, 30)	24.44%	29.65%	317
(30, 40)	34.44%	38.29%	141
(40, 50)	45.01%	45.20%	73
(50, 70)	55.18%	69.69%	33



All results presented here are for the 30-day prediction window. A “Bin of Predicted Risk” is defined as predicted risk that fall within a specific range e.g. 2.5-5% likelihood of a 30-day event.

Results

A XGBoost based ML model incorporating both physical and psychiatric health concerns gave the best performance, reaching AUROC of 0.802 and 0.757 for the 30-day and 90-day prediction windows respectively. Up to the top 2.5 percentile of predicted risk, the model was able to capture all actual suicidal and ISH events.

%ile of Pred, Risk	Count of scenarios	Count of pred. events	Count of actual events	Sensitivity	Specificity	PPV	NPV
0.1	52	52	34	100.0%	NA	65.4%	NA
0.5	260	260	113	100.0%	NA	43.5%	NA
1	520	520	191	100.0%	NA	36.7%	NA
1.5	779	779	246	100.0%	NA	31.6%	NA
2	1039	1039	293	100.0%	NA	28.2%	NA
2.5	1298	1298	334	100.0%	NA	25.7%	NA
5	2596	1391	458	76.9%	51.4%	25.3%	91.2%
10	5191	1391	581	60.6%	77.4%	25.3%	94.0%
15	7786	1391	669	52.6%	85.4%	25.3%	95.0%
25	12977	1391	791	44.5%	91.5%	25.3%	96.2%
50	25953	1391	960	36.7%	95.8%	25.3%	97.5%
100	51906	1391	1125	31.3%	98.0%	25.3%	98.5%

Net Additive Benefit of ML model: Self-reported risk of ISH assessed at presentation for care used the hospital’s routine suicide risk protocol. Comparison of ML model predicted risk values by visit vs. self-assessed risk showed significant differences in risk distribution (F=31.544 (df 2, 149.7); p= 3.69e-12), with clear benefit of ML evaluation, even when patient self-assessment of risk was low.

Pt self-report risk level	(ML Predicted) 30-day ISH	(ML Predicted) NO 30-day ISH	Total % events, By Risk Lvl
Low	53	864	5.77
Moderate	29	141	17.05
High	34	56	37.77

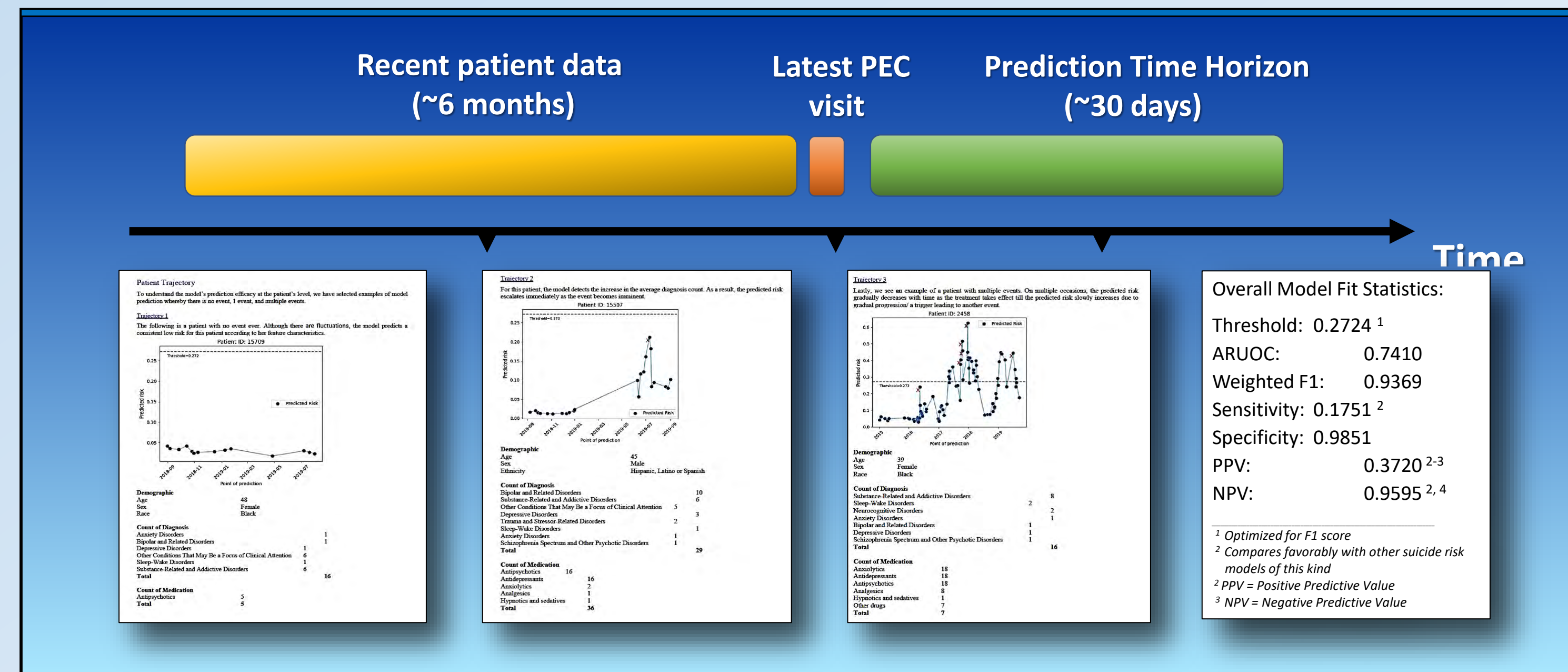
Conclusions

This novel method for predicting fatal and nonfatal suicidal and other ISH events using a sliding window approach and ML methods can estimate changing risk within 30 and 90 days after a patient’s ED visit. The net additive clinical utility of this risk stratification model, used with patient self-assessment, suggests ways the model can be used in effectively in clinical care.

holmusk Analysis by Holmusk USA, Inc.

The following groups and individuals are gratefully acknowledged for the many hours of work donated to data preparation for this study: JPS IT & Office of Clinical Research; 2018 & 2019 chart review teams (see author list); Melax Tech, Inc. (natural language processing consultants) and Michael Schoenbaum (NIMH)

Support for this project comes from the Jordan Elizabeth Harris Foundation, the JPS Foundation and Holmusk USA, Inc.



Practical Analytics: UN SDG 1 No Poverty Applied to Vets Who Are Homeless

S. Lee, PhD, RN, CNE, CPXP, FAAN; M. Tietze, PhD, RN-BC, FHIMSS, FAAN, & C. Lopez, UT Arlington MPH Student

Background:

- Of the 630,000 homeless Americans, 67,495 are Military Veterans who are homeless (MVH).
- United Nations (UN) Social Development Goal (SDG #1) reported extreme poverty rates have been declining.
- Until all MVH who choose housing are placed, policies must be enacted.
- Academia must be inclusive through curriculum-based data analysis and policy development.

Purpose:

- Evaluate the effectiveness of an experiential teaching approach for health informatics (HI) Graduate students focused on the UN SDG #1 applied to MVH, where practical data analytics support policy development for this disparate population.



Participants in Poverty

- For those people living in poverty, relationships and friends are significant and symbolic.
- The words, advice, and opinions of friends are important.
- The actions/interactions of healthcare professionals influence and impact HVs receiving healthcare services.
- Poverty enhances diminished wellness

Implementation

1. Students watched videos, read background information and discussed US poverty, including veteran statistics and associated services to mitigate poverty.
2. Students compared and contrasted databases for evidence-based reports reflecting poverty trends.
3. Students presented rationales and findings to a local non-profit organization that addresses veterans' needs.
4. Students developed topic-based reflection papers (using the Driscoll model) addressing the what, so what, and now what aspect of their experiences.

Measurements:

Project effectiveness was determined by the degree students demonstrated experiential reflection for use of data analytics to support policy-based advocacy, such as UN SDG #1 applied to MVH.

Results and Limitations

- Experiential teaching approach was implemented in a Health Informatics Graduate course.
- At the end of the course, students reflected high degrees of experiential learning in connecting data analytics to address UN- SDG policy related to SDG 1: No Poverty..
- Students authentically shared relevant information within communities.

Discussion and Conclusions

- UN SDG #1 stresses poverty levels are global public health concerns.
- Ending extreme poverty is a priority.
- Healthcare providers must assess, recommend, and evaluate this priority to end poverty.
- UN SDG-based curriculum beneficial for students
- UN SDG-based curriculum must be included in curriculum



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- McBride S, Tietze M. (2019) Nursing informatics for the advanced practice nurse: Patient safety, quality, outcomes and interprofessionalism. 2nd Ed. Springer Publishing Co.

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Disclosure

The authors declare there was no sponsorship or commercial support for this work and there are no competing interests.

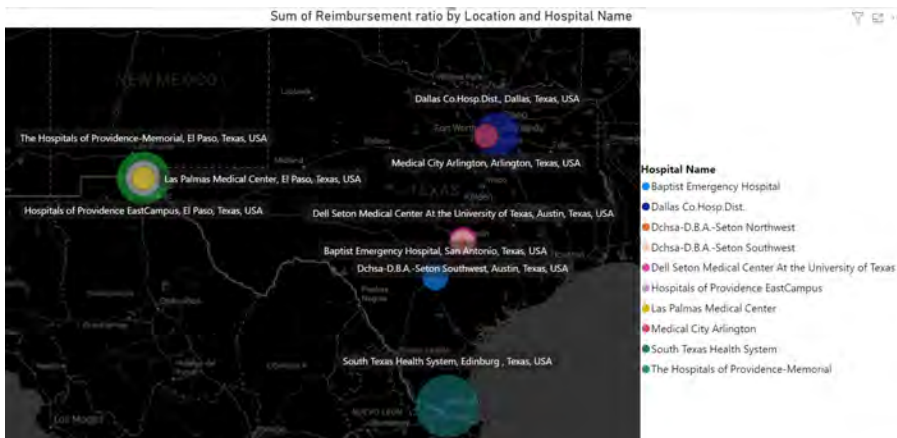
Which Outpatient Care Hospital System in Texas has the Best Reimbursement and How?

Team Lead : Anish Padala

Team Members: Vivian Ekadi, Yen Co

Data Analysts: Shraddha Kurra, Vipin Kumar

Faculty Sponsor: Dr. Keith Thurgood



Map of Texas with 10 random hospitals reimbursement ratios. The larger the circle the higher the reimbursement ratio

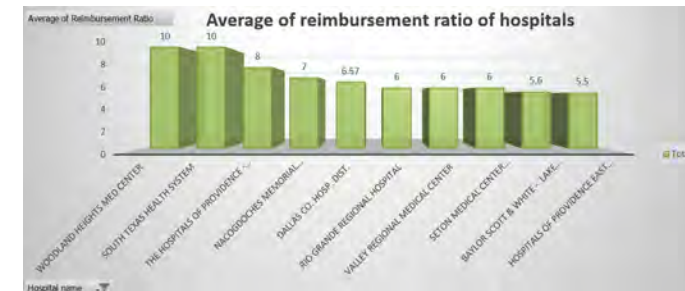
Outpatient care Services vs Standardized price



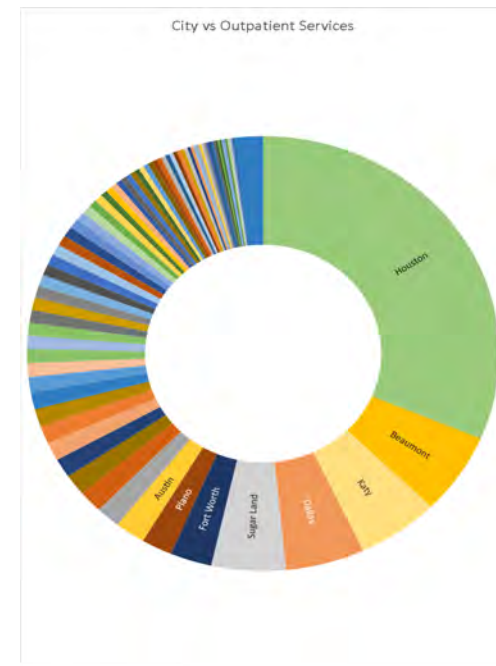
So far for this project we have created a graphs and charts to understand the data that we see from the approximately 500 hospitals in Texas. We were given data from 2018 for these hospitals about the number of services that are provided as well as the prices. The aim of this project is to conduct a comprehensive analysis and comparison of hospital reimbursement in Texas, exploring the intricate relationships between reimbursement rates and various demographic and social factors. Through rigorous data analysis, we aim to identify patterns, disparities, and correlations that exist within different demographic and social contexts, providing valuable insights for healthcare policymakers, practitioners, and stakeholders to optimize reimbursement strategies and promote equitable healthcare access across diverse populations in the state.

Current and Next Steps

Currently, we are in the process of dissecting the data and doing regression analyses to see and understand the relationship between different parts of the data that we have regarding outpatient care.



A graph representing the top 10 hospitals with the highest reimbursement ratios



How Long Can You Go? Estimating Blood Loss in AIS Surgery with Patient and Surgeon Specific Calculator

Anne Boeckmann, David Thornberg, Lydia Klickerman, Amy McIntosh MD.

¹Scottish Rite for Children, Dallas, Texas



BURNETT
SCHOOL of MEDICINE

UTSouthwestern
Medical Center

INTRODUCTION

Blood loss is a major focus in the treatment of adolescent idiopathic scoliosis due to the complexity and duration of surgical procedures. As standard practice patients who experience $\geq 20\%$ blood volume loss during a case require a transfusion. And although several studies have identified surgical and patient risk factors that correlated with massive intraoperative blood loss, they often fail to consider the surgeon operating. Therefore the goal of this study was to compare actual blood loss versus blood loss predictions generated by patient/surgeon specific calculations.

METHODS

- Retrospective Review of AIS patients who underwent index fusion
- Surgeons with ≥ 100 unique patients were included
- Actual estimated blood loss per level (aEBLL) was calculated by EBL divided by number of levels fused in the case
- aEBLL was used to calculate average blood loss per level (avEBLL) for each surgeon
- Predicted estimated blood loss (pEBL) was calculated against each individual case (avEBLx fusion levels)
- pEBL was further quantified as predicted % blood volume loss (pPBVL) relative to patient weight
- aPBVL and pPBVL were further categorized as $<20\%$ vs $\geq 20\%$ blood volume loss.
- Chi-Square Test of Independence, Pearson's correlation, and paired t-tests were performed to assess/compare aPBVL vs pPBVL.

RESULTS

- 692 AIS cases were reviewed from 4 fellow-trained orthopedic surgeons
- Mean age at surgery was 14.6 ± 2.1 with a mean curve Cobb of $63^\circ \pm 12.5$
- Paired T-Tests show no significant difference between aPBVL and pPBVL for any surgeon
- All Pearson's correlation coefficients were significant and demonstrated strong positive correlations ($r > .50$).
- There was a significant relationship between aPBVL and pPBVL when categorized by $<20\%$ vs $\geq 20\%$ blood volume loss for all surgeons. (See Figure 1).

CONCLUSIONS

By using a surgeon's average estimated blood loss per level and fusions levels, we were able to calculate a predicted % blood volume loss for individual patients. There was a significant association between these predicted % blood volume loss and actual % blood volume loss. Additionally, we found no significant difference between the predicted % blood volume loss and actual % blood volume loss. The implementation of a surgeon/patient-based predicted % blood volume loss calculator may help guide PRBC orders prior to surgery.

Figure 1. Chi-Square Test of Independence, Pearson's correlation, and paired t-tests performed to assess/compare aPBVL vs pPBVL.

Surgeon	Paired T-Test			Chi-Square Test of Independence		Pearson's Correlation	
	Predicted % Blood Volume Loss (pPBVL)	Actual % Blood Volume Loss (aPBVL)	p-value	Chi-Square	p-value	Coefficient	p-value
1	13.8 ± 4.4	14.1 ± 9.1	0.8	$X^2(2, N=104) = 15.5$	<0.001	0.551	<0.001
2	15.1 ± 4.7	15.3 ± 9.3	0.8	$X^2(2, N=149) = 22.4$	<0.001	0.593	<0.001
3	13.9 ± 4.8	14.2 ± 11.1	0.6	$X^2(2, N=181) = 11.4$	<0.001	0.531	<0.001
4	12.5 ± 4.3	13.0 ± 11.6	0.5	$X^2(2, N=258) = 27.2$	<0.001	0.515	<0.001

ATTACK OF THE BOTS: RESEARCHERS BEWARE

Dixie Rose, PhD, RN, ACUE, Univ of Texas at Tyler; Cheryl Parker, PhD, RN-BC, CNE, ACUE, Univ of Texas at Tyler; Susan Newman, PhD, RN, CRRN, MUSC; Mohan Madisetti, BSc, MSc, MUSC

BACKGROUND

Web-Based Surveys:

- Convenient, cost-effective and used with increased frequency¹
- Allowed research to continue during pandemic¹
- Vulnerable to fraud²
 - Hard to detect³
 - Often in the form of bot attacks³
 - Threatens data integrity³

Case Study:

- Stroke Caregiver Research Study
- Online survey hosted through REDCap⁴
- reCAPTCHA enabled to prevent fraud
- Distributed through 2 national organizations
- 6,961 returned records over a 4-day period

PURPOSE

- Deconstruct a case study of a bot attack to identify
 - Recognition of bot responses
 - Data cleansing methods

METHODS

Indications of bot responses

- Foreign language (Latin and Chinese)
- Records with multiple identical free text fields
- Records with time stamp within one minute
- Records with nonsense free text entries

8/3/2021 4:50				
8/3/2021 2:39	Do you have any recommendations on how we could change the study to make it more appealing to you?	What would prevent you from participating in future research studies?	Do you have anything else you would like to add about your experience with this survey?	Do you have anything else you would like to add about your caregiving experience?
8/3/2021 5:31				
8/3/2021 4:11	Add some images of actual care for our selection	Maybe my family	The experience was relatively good	No more
8/3/2021 1:59	Add some images of actual care for our selection	Personal privacy	So far the experience has been good	The caretaker has some compensation
8/3/2021 2:51	Add some images of actual care for our selection	The people I care for might disagree	The caretaker has some compensation	Nope
8/3/2021 4:26	Add some images of actual care for our selection	The people I care for might disagree	So far the experience has been good	No more

Data Cleanse

- Removed records with foreign language free text and 3 or more identical free text entries
- Examined nonsense entries
- Determined data too compromised to maintain scientific integrity

Survey relaunched

- Screening email
- Survey link emailed after screening
- Data cleanse protocol identified

RESULTS OF RELAUNCH



CONCLUSIONS

Researchers must:

- Stay abreast of AI methods specific to data collection platform
- Employ counter measures
- Data cleanse protocol prepared ahead of survey launch
- Survey distribution as close to participant as possible
- Data evaluated for scientific integrity before data analysis begins



How Robotics Impacted Nurses' Workload & Satisfaction in Acute Care

Laura Burnett, MSN, RN, NEA-BC, CPXP; Julie Balluck, DNP, RN, NEA-BC



Problem

- The COVID-19 pandemic had significant impact on the nursing workforce highlighting the need for innovative solutions to:
- Reduce nurses' workload
- Fill the gap created by 159 nursing vacancies; few applicants
- Increase nurse satisfaction in acute care (journal.org/articles/post-pandemic-nursing-shortage/ 2023).

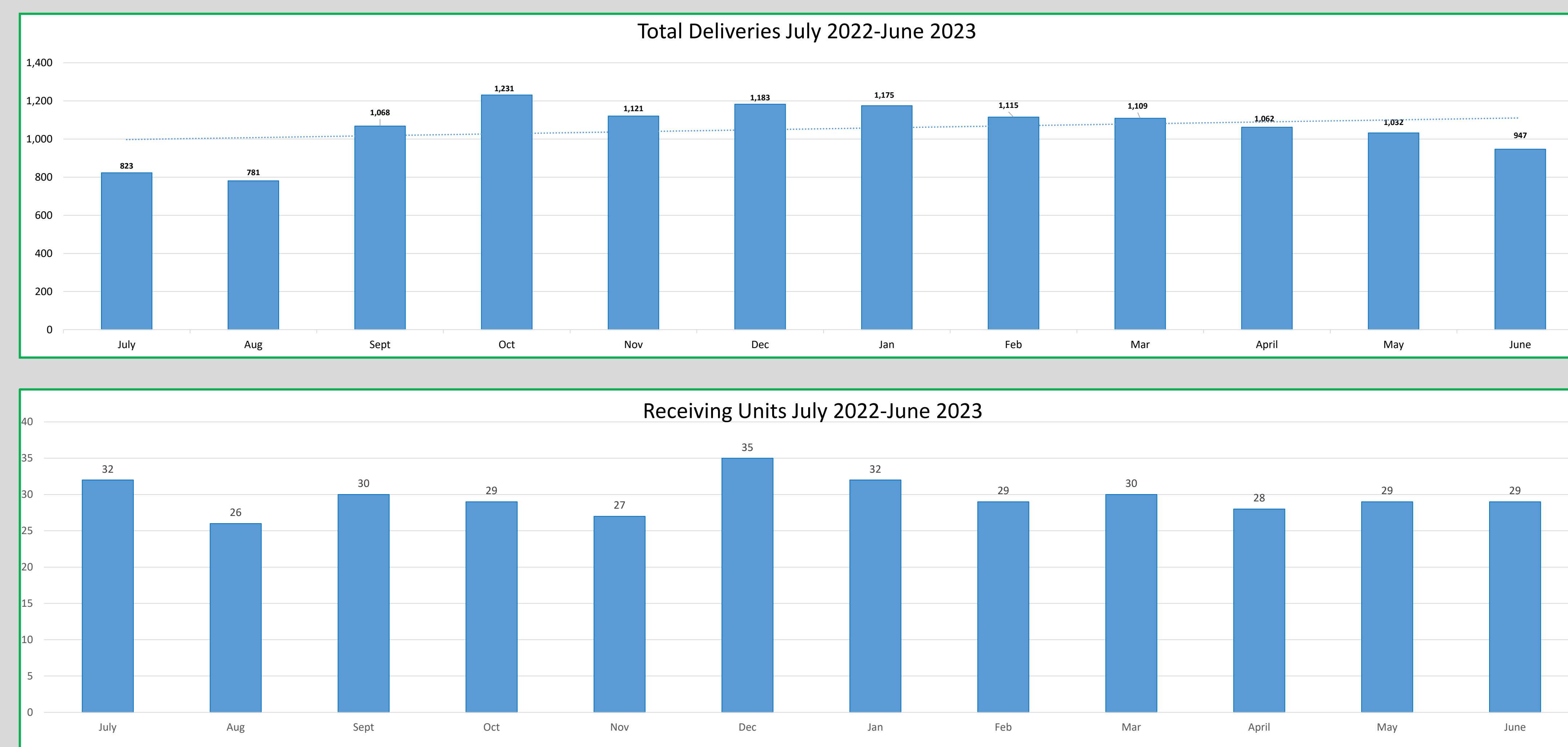
Purpose

What supportive and innovative solutions will address the nursing shortage, offload non-clinical tasks from nursing, ensure nurses can work top of license & competence, and remain at the bedside?

Methods

- Introduction of artificial intelligence (AI) service robot, Moxi, into the acute care setting.
- Moxi performed, non-patient facing point to point deliveries, offloading tasks from the nursing team.
- Evaluated impact, adoption, and sustainability of service robots as part of the healthcare team.

Adoption (Deliveries) & Sustainment (Receiving Units)



Findings

- Between 2022 and 2023, the National Database for Nursing Quality Indicators (NDNQI) Nursing Survey question on “staffing and resource adequacy” showed improvement in 8 out of 13 inpatient nursing units.
- Adoption and sustainability are demonstrated by increased utilization of robots over time and consistent use among multiple nursing and non-nursing units.

On the cutting edge...

Average number of hours/day the two robots are in use = 17 hours

Average robot delivery time, from request to delivery = 16 minutes

Robot enhancements since July 2022 = 150+

Hours returned to staff = 5700 hours

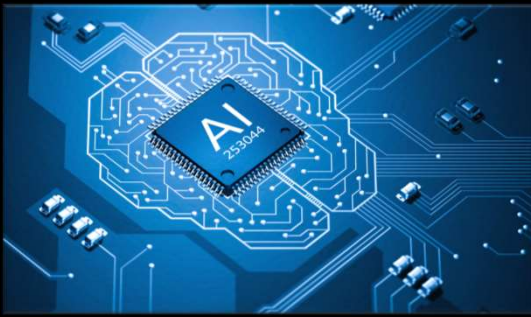


Conclusions

- Use of innovative technology within healthcare must be used in assisting the clinical team.
- With forecasted nursing shortages, AI technologies like Moxi will become increasingly important in providing safe and effective care.
- New and innovative ways for use of robotics will assist healthcare personnel in all disciplines.

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HARNESSING THE POWER OF AI TO TRANSFORM HEALTHCARE DOCUMENTATION: A CASE STUDY ON BELLS AI'S IMPACT AT MHMR OF TARRANT COUNTY

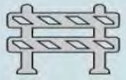
Linda Perna Ph.D., Cherie Tidwell M.S., Kimberly Niestroy B.S.,
Camille Patterson Ph.D., & Kirk Broome Ph.D.
My Health My Resources of Tarrant County



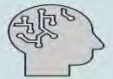
Background and Introduction



Clinical service documentation is part of a "Golden Thread" connecting medical needs and treatment plans, service delivery, billing, and quality improvement.¹



Despite its importance, healthcare professionals experience many barriers that negatively impact their ability to provide comprehensive clinical information in an accurate, complete, and timely manner.²



Bells AI, from Netsmart Technologies, is an artificial intelligence (AI) documentation tool that is smart, intuitive, and designed to alleviate documentation burdens and enhance overall quality of behavioral health services.³



MHMR of Tarrant County implemented Bells AI in April 2023 in efforts to improve documentation quality and address staff concerns with documentation burden.

Methodology



Population sampled included nurses, therapists, and other credentialed staff providing behavioral health, substance use treatment, and disability services to patients and families



Comparative quantitative analysis of clinical documentation six months before and six months after Bells AI implementation



Examined data from internal Key Performance Indicators and post-implementation statistics



Collected pre/post surveys on staff operations, impact, and satisfaction

References

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2. Strudwick G, Jeffs L, Kemp J, et al. Identifying and adapting interventions to reduce documentation burden and improve nurses' efficiency in using electronic health record systems (The IDEA Study): protocol for a mixed methods study. *BMC nursing*. 2022;21(1):213. doi:10.1186/s12912-022-00989-w
3. AI Documentation Assistant: Netsmart. Accessed January 2, 2023. <https://www.ntst.com/CareFabric/CareGuidance-Solutions/AI-Docmentation-Assistant>

Results

62%
Of practitioners spent
less time on
documentation

58%
Reduction in
average days to
documentation

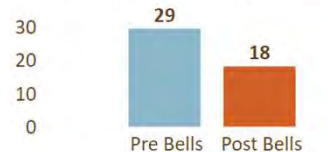
54%
Of practitioners served a
higher volume of
patients

42%
Increased satisfaction
with documentation
process

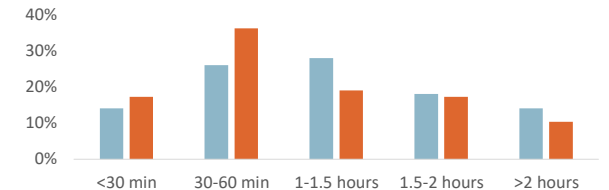
Services Delivered by Month



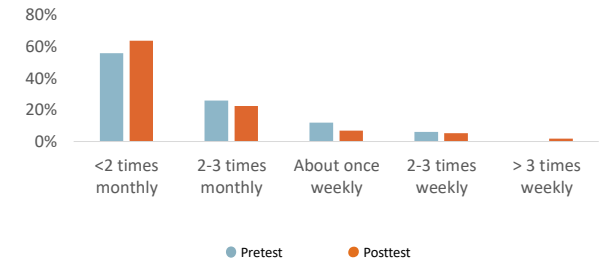
Average Days in Accounts Receivable



Documentation Time Per Day



Frequency of Progress Note Corrections



Conclusions and Future Directions

- Findings support Netsmart's data which suggest Bells AI enhances efficiency of documentation processes resulting in clinical and financial gains for service providers and organizations.³
- The current data show Bells AI users spend significantly less time on documentation activities, made fewer documentation corrections, reduced the time to start documentation after providing services, and there was a reduction in time from session to claim to payments. Additionally, compared to before Bells AI implementation, practitioners were able to see more patients, increase the number of services provided, and were more satisfied with the documentation process after Bells AI implementation.
- Findings may suggest that Bells AI holds substantial positive implications for productivity in various clinical and operational domains. The time efficiency gained through AI utilization empowers practitioners to reallocate resources to other critical clinical activities, thereby enhancing access to care, fostering greater patient engagement, and elevating overall care quality. This not only aids staff in performing higher quality work but also contributes significantly to improved patient outcomes.
- In exploring future directions, upcoming research should examine the financial implications and long-term cost savings associated with Bells AI. Recognizing its integral role in the continuous quality improvement process, it is also essential to examine how Bells influences staff retention and onboarding processes. Additionally, there is a need to specifically investigate how AI technology, such as Bells, impacts programmatic and patient-level outcomes, shedding light on its broader impact on healthcare delivery.



Robotics and the Impact on Nursing Care, Associated Artificial Intelligence, and Multi-Robotics



Mari Tietze, PhD, RN, BC-NI, FHIMSS, FAAN, Addison Clark, Univ. of Texas at Arlington
Susan McBride, PHD, RN, BC-NI, CPHIMS, FAAN, University of Texas at Tyler, Divya Prakash, Austin College

Introduction & Purpose

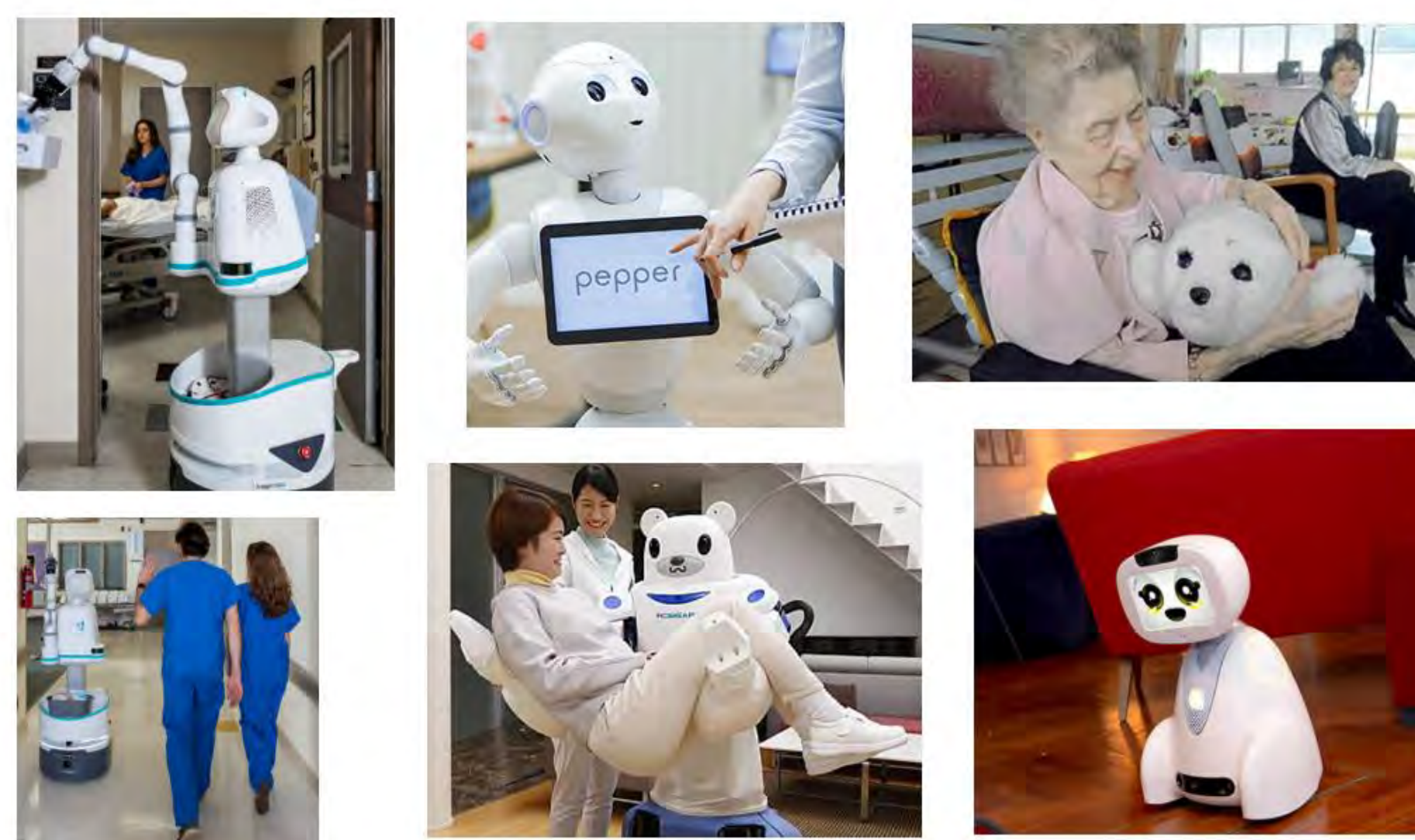
- Robotics, Artificial Intelligence (AI) and Machine Learning (ML) in nursing care will transform and revolutionize care delivery.
- A study supported by American Nurses Association (ANA) examined three pilot sites that implemented service robots to support nursing in their institutions.
- There are unique characteristic of organizations that deploy robotic and AI innovations.
- This presentation will describe the experiences of three pilot sites, themes, and recommendations. In addition, the role of artificial intelligence in robotics, in health care, and the application of multi-robotics to support health care delivery will be described.

Robotics in Healthcare Delivery

According to Locsin (1995)[4], the concepts of technology and caring within the context of competencies for nursing care delivery illustrate the realities of advancing technologies in health care.

Robotics to support nursing calls for a new examination of models of nursing care delivery updated to reflect the massive amount of technology being used.

Robots in Healthcare Delivery



- Nurses must ensure that robot technology maintains patients' dignity, privacy, preferences, and safety.
- Robotics must also be used ethically with patient consent and ongoing outcomes assessment.

Policy Implications

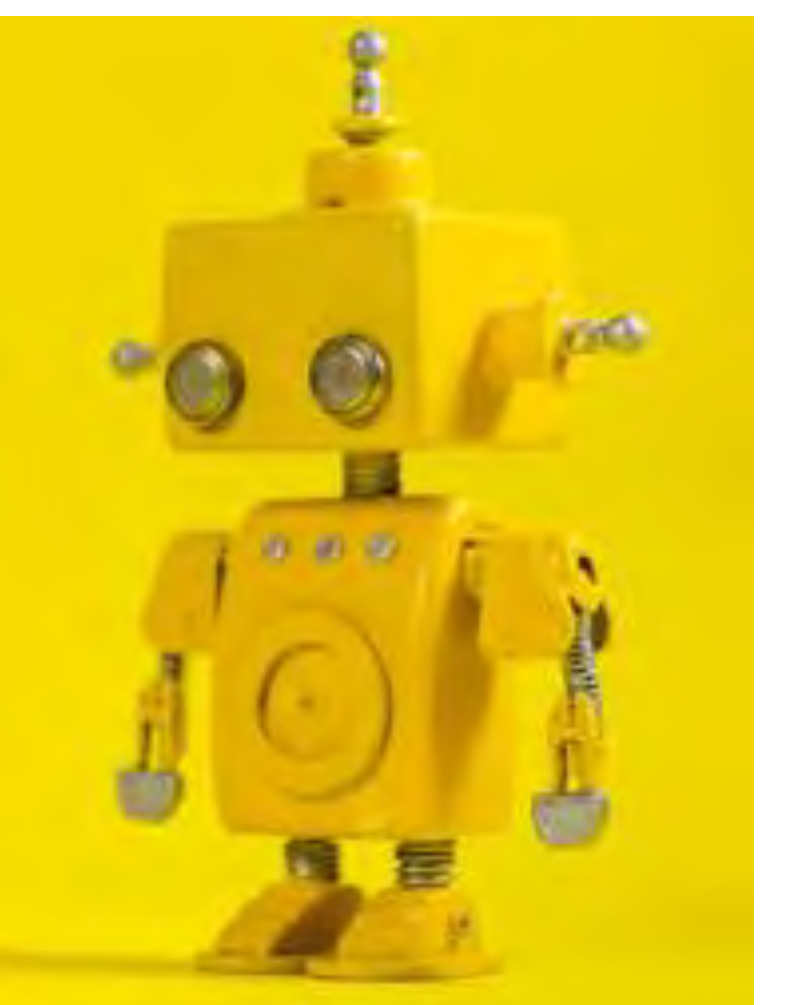
World Health Organization: Key ethical principles for the use of AI for health

- Protect autonomy
- Promote human well-being, safety and the public interest
- Ensure transparency, explainability, and interpretability
- Foster responsibility and accountability
- Ensure inclusiveness and equity
- Promote AI that is responsible and sustainable

Ethics and governance of artificial intelligence for health: WHO guidance. Geneva: World Health Organization; 2021. License: CC BY-NC-SA 3.0 IGO

Discussion

- Complex innovations such as robotics with AI require multi-faceted approaches to achieve effectiveness and user satisfaction
- Propel nursing capabilities and enable nurses to provide more evidence-based and personalized care to their patients.
- Support responsive and evidence-based nursing practice through cognitive insights and decision support (e.g. insights for patient care and long-term planning).



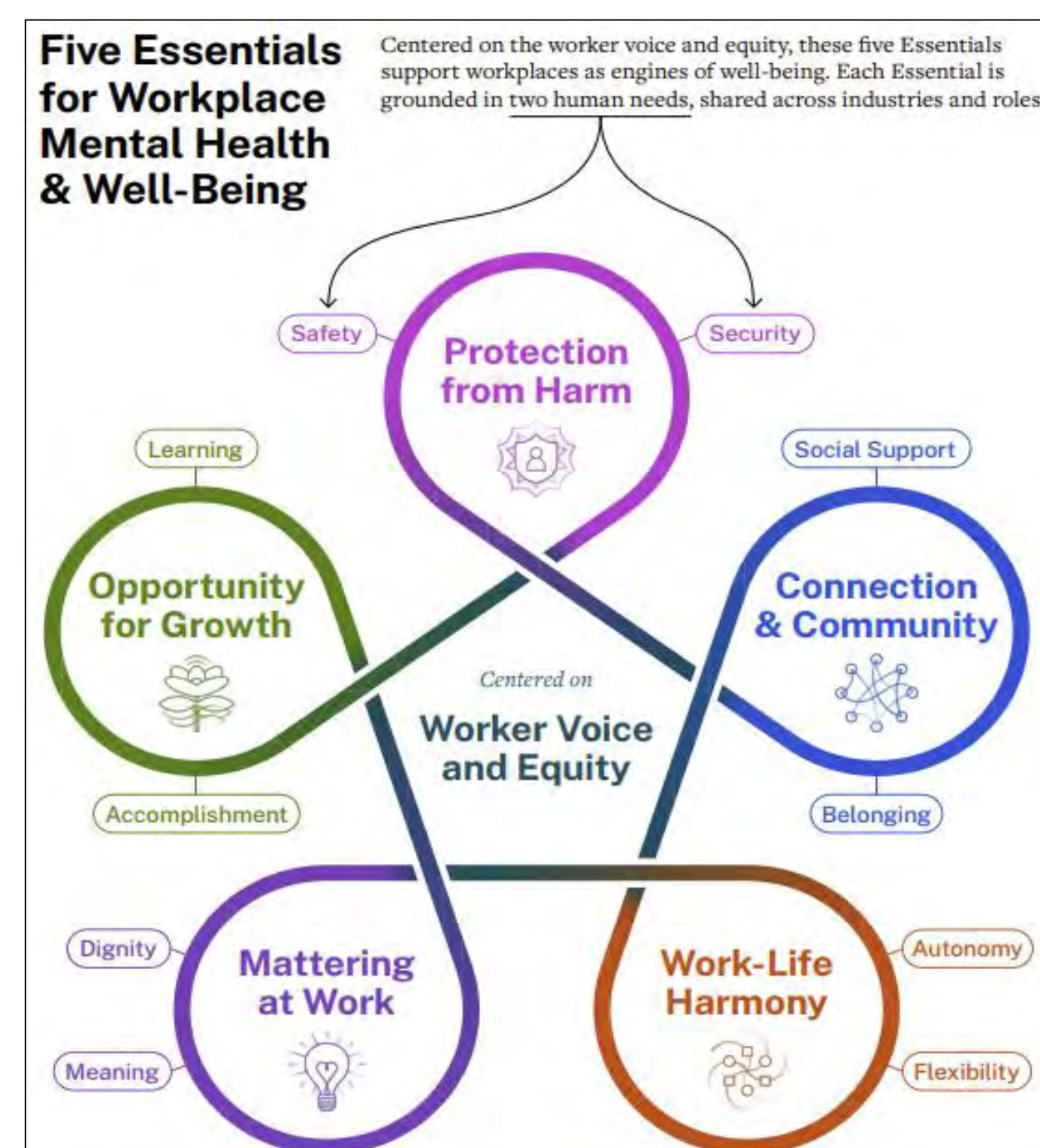
Conclusions

Collaborate with others involved in healthcare robotics.

Explore use of AI with other disciplines focused on healthcare

Background

- Over 22 Million healthcare workers in the US experience burnout. [1]
- Burnout is an "occupational phenomenon"... International Classification of Diseases [2]
- Below is the U.S. Surgeon General's Framework for Workplace Mental Health & Well-Being [3]



Artificial Intelligence in Robotics

- One capability that has enabled an increasing number of applications is the ability for AI to safely navigate indoors around people. An example of this is warehouse logistics, where a warehouse for a company such as Amazon has robots that operate alongside human workers (Clipper et al., 2018)[5]
- Artificial intelligence is commonly a component of the engineering for robotics, including those robots used in healthcare delivery (Tietze & McBride, 2023)[6]

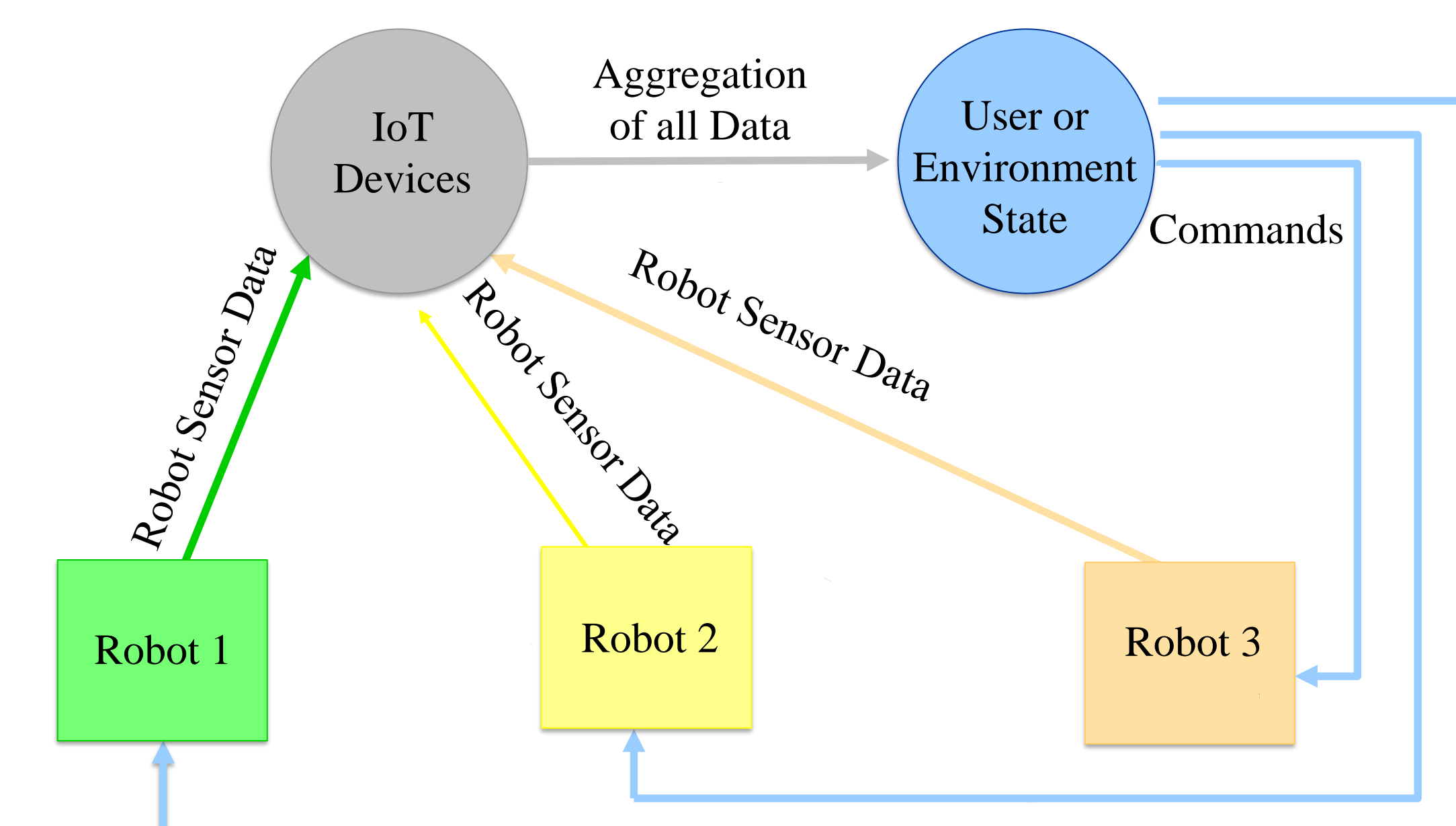
Robotics, AI, & ML implementation teams must focus on five foundational adoption factors:

Safety and reliability	Capability and function	Cost-effectiveness	Clinical effectiveness	Usability and acceptability

Nurse competencies should also focus on the use of robotics to maintain the caring components of the nurse-patient relationship.

Multi-Robot Systems for At-Home Healthcare

- Simpler robots are cheaper and more accessible
- Less complex systems are more reliable/ less prone to failure
- Customization and scalability to meet the needs of different patients



An example high-level control flow diagram for a multi-robot system (Clark and Ahmad)[7]

References

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ANALYSIS OF RACIAL DISPARITIES IN HYPERTENSION IN INTERNAL MEDICINE CLINICS AT A LARGE ACADEMIC MEDICAL CENTER

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Background

HTN is the most prevalent modifiable risk factor for cardiovascular disease with nearly half of the adult US population meeting diagnostic criteria [1]. Treatment and control of HTN is an important public health challenge due to substantial percentage of patients with uncontrolled BP and its strong association with increased cardiovascular disease risk especially stroke and heart failure [2]. Despite efforts to improve treatment and control of BP, management of HTN has not been equitable for persons from racial and ethnic minority groups [3].

Objectives

To identify the patterns and opportunities correlated to Racial disparities in hypertension Diagnosis and control (BP Reading of systolic <=140 or diastolic <=90) within the department of Internal medicine.

Demographic Analysis

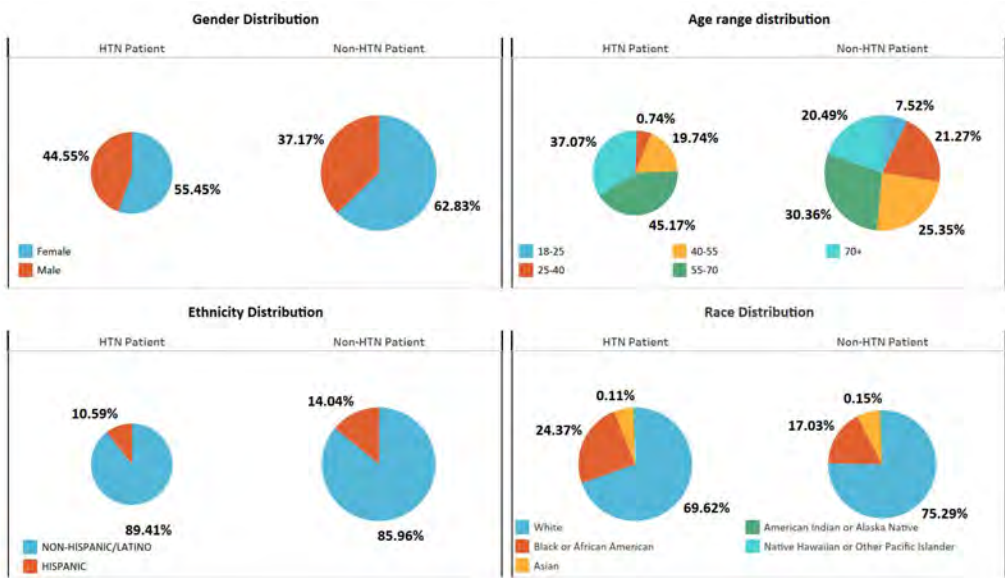


Figure 1. Distribution of HTN and Non-HTN patients by Gender, Ethnicity and Race from CY21-CY23 . (Total encounters: 147,288)

Analysis by Race and Age Groups



Figure 2. BP Control Rates by Race and Age Groups

Conclusions and Future Initiatives

Conclusion: Analysis/Data shows a much larger proportion of whites & non-Hispanics compared to other races. [Fig.1] Proportion of females (55.45%) is larger compared to males (44.55%), in hypertensive patient group.[Fig. 1] In the 55-70 and 70+ age group, a much larger proportion of white patients had their BP controlled compared to other races. [Fig. 2]

Future Initiatives: Increase awareness and scheduling follow-ups for the HTN diagnosed patients for underrepresented race and ethnic groups.

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Sepsis in the Dallas-Fort Worth Area in Relation to Social Determinants of Health



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University of Texas Arlington, College of Nursing and Health Innovation

Abstract

Texas is the second-largest state in the United States. Even a small proportion of Texas has hundreds of thousands of people.

We used the THCIC [1] dataset to analyze the top three principal diagnoses in Texas, the number one being sepsis. The analysis then focused on sepsis in North Texas, specifically, the Dallas-Fort Worth area.

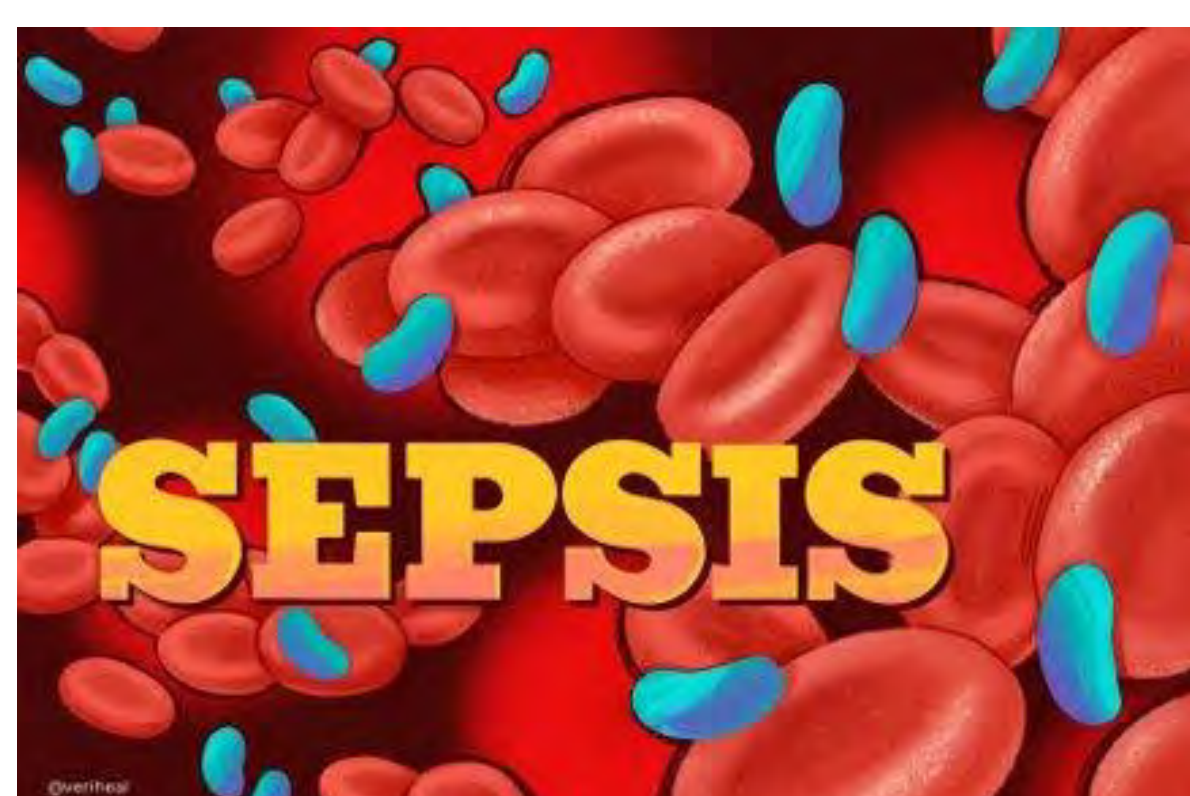
Sepsis, a bacterial infection of the blood, is a common condition affecting millions of Americans annually. Using a mixture of public and governmental data, we explored the extent to which sepsis correlates with the *social determinants of health*.

Background

Sepsis is the body's extreme response to an infection. It affects a wide range of health, functioning, and quality-of-life outcomes and risks.

2023 Health Equity Index is a measure of socioeconomic need that is correlated with poor health outcomes. .

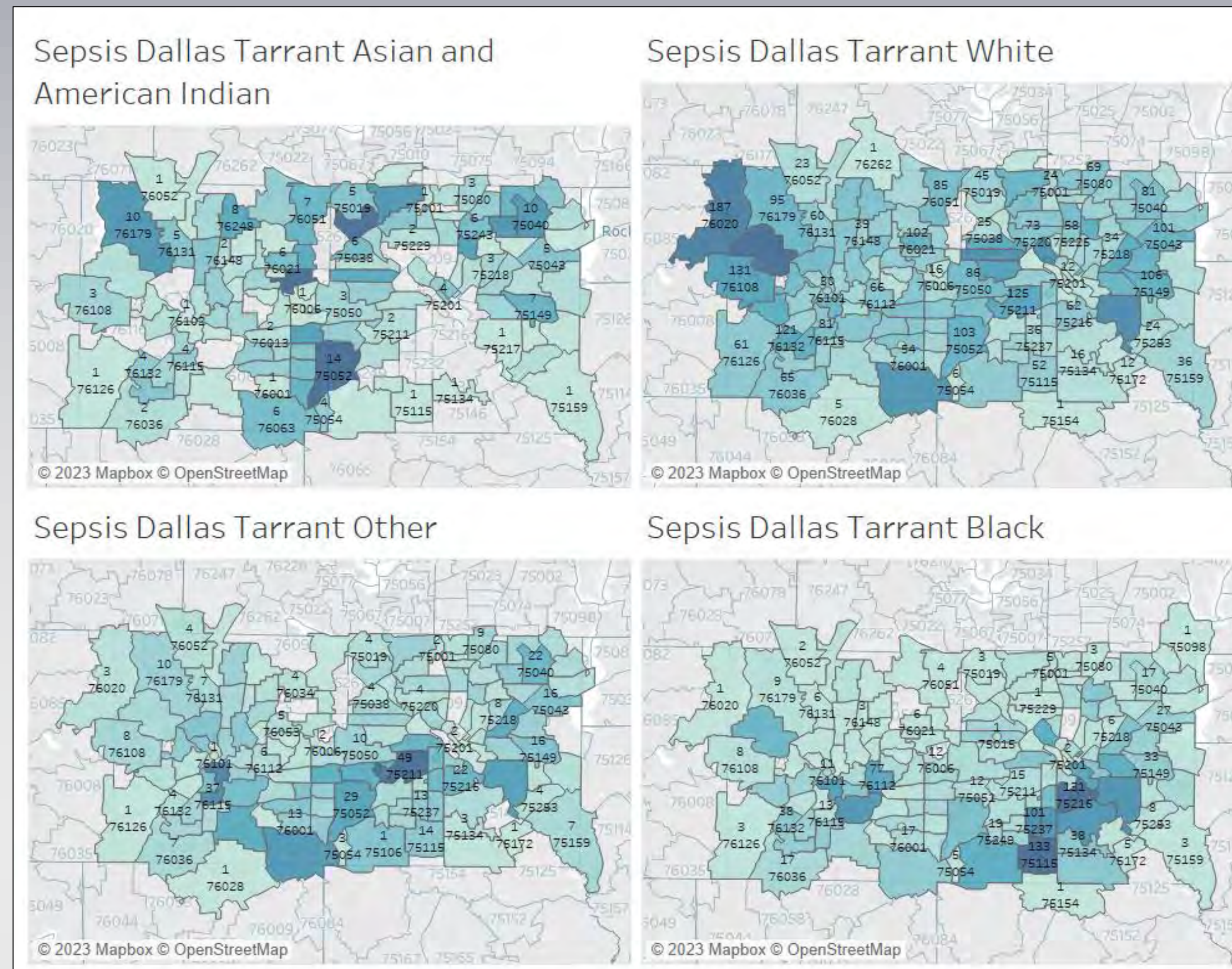
At least 1.7 million adults in America develop sepsis. At least 350,000 adults who develop sepsis die during their hospitalization or are discharged to hospice (CDC).[2]



Methods

Using discharge claims data from the THCIC database, we explored counts and trends of sepsis events in Dallas-Tarrant county area, between 2019Q3-2022Q1.

1. Geographic distribution of sepsis cases by ZIP codes and race. For example, blacks had highest number of sepsis cases, 133.
2. Relationship between SDOH via the *Health Equity Index* and sepsis.



Social Determinants of Health

Social determinants of health (SDOH) [4] have a major impact on people's health, well-being, and quality of life. For example, people who don't have access to grocery stores with healthy foods are less likely to have good nutrition.

SDOH include factors such as:

- Safe housing, transportation, and neighborhoods
- Racism, discrimination, and violence
- Education, job opportunities, and income
- Access to nutritious foods and physical activity opportunities
- Polluted air and water
- Language and literacy skills



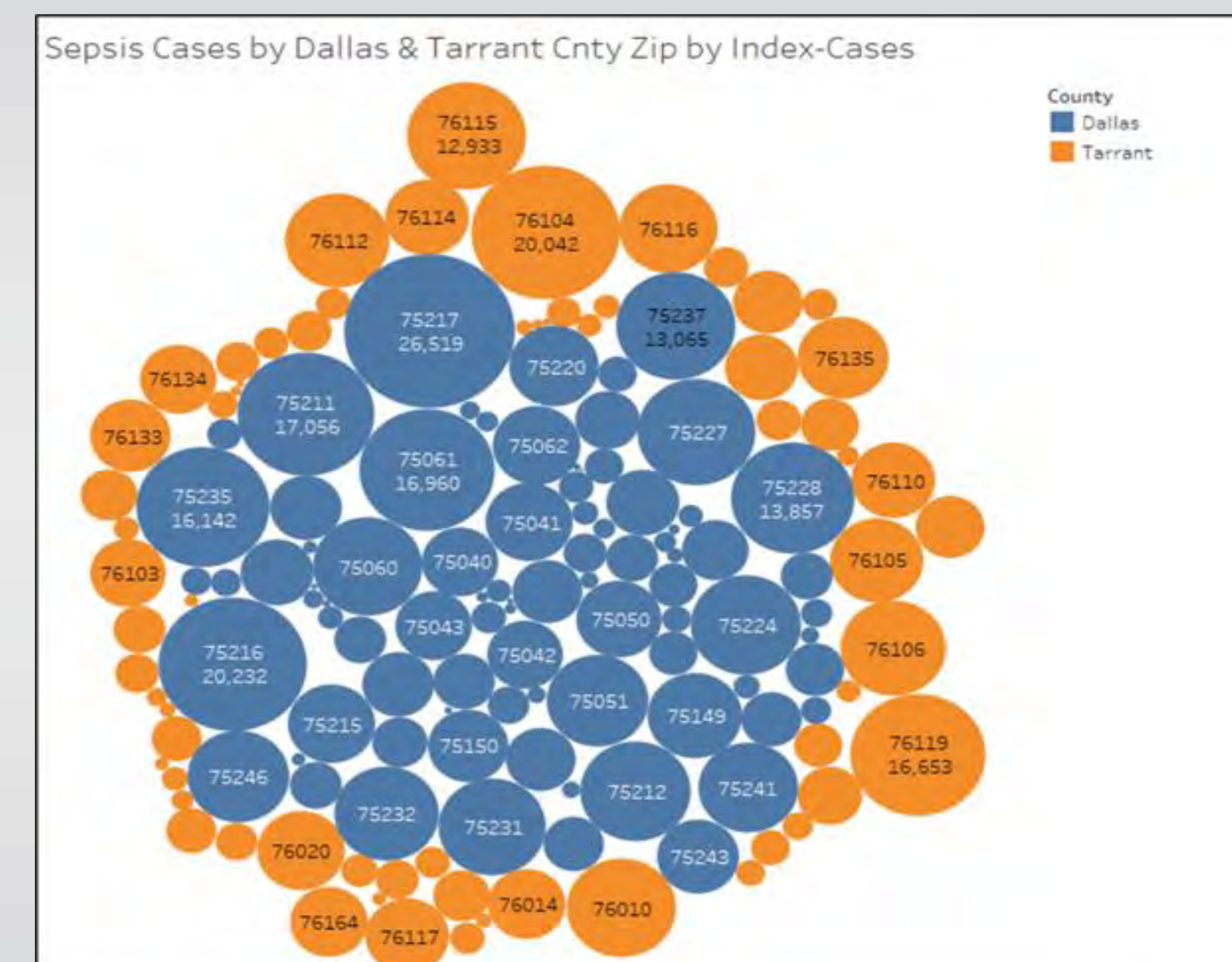
Results

Per geo-maps [Figures to the left], we found that certain groups, such as the black population, were negatively affected by sepsis.

For example, multivariable analysis yielded health equity index-based sepsis results. For Example:

- 75217 (Dallas) had the **highest** health equity index-case score of 26,519
- 76104 (Tarrant) had the **highest** health equity index-case score of 20,042

Allowing for prioritization strategies to improve sepsis rates in those ZIP codes [Figure below]



Health Equity Index

- 2023 Health Equity Index [3] is a measure of *socioeconomic need* that is correlated with poor health outcomes. Scale is 1 [low] to 100 [high].
- Conduent HCI's *Health Equity Index* (HEI) considers validated indicators related to **income, poverty, employment, education, language, Medicaid enrollment, and race to identify areas at highest risk for experiencing health inequities**. High socioeconomic needs correlated with preventable hospitalizations, premature death, and self-reported poor health and well-being.
- Regarding education, we found that 2021 high school dropout rate [5] for Dallas county was the highest for blacks at 5.3% [compared to the 4.4% overall rate]
- Highest HEI scores are Dallas=94.8, Tarrant=97.7

Discussion

It is suggested there be some management for the rate of sepsis contraction driven by SDOH

For example, an ANOVA from SPSS revealed the race of black had a statistically significantly higher Health Equity Index than other races

Thus, it is suggested that there be more focus on the black populations because of their higher rate of contracting sepsis

Highschool drop out rates impact health literacy and is a SDOH that should be addressed

Conclusions/ Policy Implications

Concentrating improvement efforts in counties more affected by sepsis would help address many social issues.

Those affected also face poverty, low income, and high dropout rates. Addressing sepsis is more complicated than addressing a single factor; thus, a combination of efforts should be applied.

Implementation of sepsis avoidance management is warranted and we must disseminate results at all community levels.

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Evidence-based Recruiting for Artificial Intelligence and Machine Learning Talent: Career Identification



Shakera Moreland, DHSc, MBA, RHIA, CSM with Mari Titetze, PhD, RN-BC, FHIMSS, FAAN

Introduction

With 76% of global employers using assessments in hiring, integrating career assessment tools with DISC profiles supports ongoing research.

Extending this concept to career identification becomes crucial, where DISC profiles, alongside other tools, provide insights into communication styles, behaviors, and work preferences.

This approach forms the basis for further research, enhancing career selection and assessing readiness for roles, especially in dynamic fields like Artificial Intelligence and Machine Learning usage within healthcare.

Background

The study aims to investigate whether there is a correlation between DISC personality profiles and identified AI/ML niches.

The research will involve examining the DISC personality profiles of participants and analyzing how these profiles align with specific AI/ML niches.

The goal is to determine if certain personality traits are associated with proficiency or preferences in particular AI/ML areas.

The results could be used to provide insights for professionals in career navigation, helping them identify domains that align with their strengths and preferences.

Determining AI/ML Niches

Extensive research, coupled with expert consultations, was undertaken to analyze the landscape of artificial intelligence and machine learning in healthcare. Employing thematic analysis, similar technologies were grouped, resulting in the identification of four key domains.

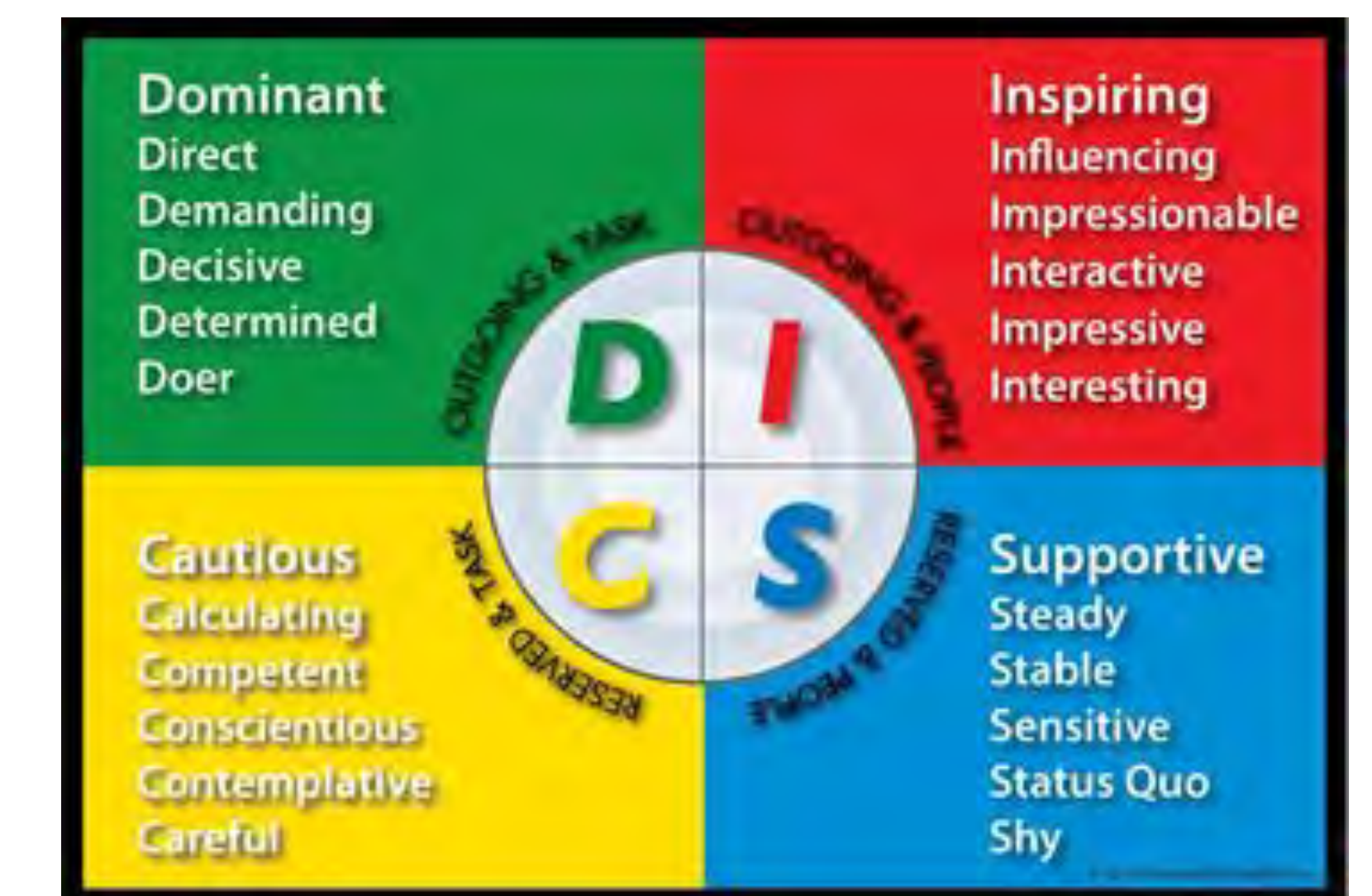


These domains present a concise framework for understanding the diverse applications of AI/ML in healthcare.

DISC Profile Usage

Choosing DISC profiles stems from their broad usage and simplicity. Globally recognized, DISC provides a straightforward yet effective way to understand communication styles and work preferences.

This aligns with the research focus, ensuring a broadly adopted tool for grasping individual traits in career identification and readiness assessments.



Methods

The procedures involve a two-part assessment. In the first part, participants will complete an abbreviated version of the DISC profile personality assessment, comprising 14 questions (dependent variable).

Subsequently, participants will proceed to the second part, where they will take an AI/ML identification assessment consisting of 10 questions designed (developed with the help of SME's, recruiters, and employers) to identify their specific areas of interest within the AI/ML domains (independent variable).

This process aims to correlate DISC personality profiles with identified AI/ML domains.

Example Question to Identify Niche

A high-profile patient is under your hospital's care, what is your role to ensure their information is not leaked to the press?

☐ Monitor network traffic for any unusual behavior on the network.

☐ Conduct regular audits of profile and chart access within the EHR.

☐ Ensure that media, communications, and other related policies, behavior, and training are appropriate for the specific environment and comply with the policies, best practices, professional standards, and ethics.

☐ Bear ultimate responsibility for understanding network and EHR traffic and behavior, monitor DLP alerts, and work with compliance to remind staff of the privacy and security policies regarding HIPAA.

Real-World Scenarios

Realistic Answer Choices

Participant Incentive

Design, document, develop and roll out financial, clinical and utilization analyses using a variety of computing tools (e.g., SQL, Excel)

0 - No Exp. 1 - Education Exp. 2 - Direct Exp.

Survey completion invites participants to assess their skills gap in alignment with their identified niche, facilitating personalized insights for targeted professional development.

Study Conclusion and Participant Insights

Study Conclusion and Statistical Analysis: Concluding the study involves statistically measuring the relationship between behavioral analysis and career assessment, utilizing correlation and/or regression analyses to quantify the link between individual traits and career paths.



Participant Insights and PDF Resource. After the survey, participants get a 10-15 page PDF with insights on personality, career paths, job roles, readiness, skills, and actionable steps. The PDF includes resources for personalized career

development.

Contact: info@himconcierge.com

Next Steps

- ✓ Identify Research Objectives
- ✓ Literature Review
- ✓ Hypothesis Development
- ✓ Research Design
- ✓ Survey Instrument Development
- ✓ Pilot Testing
- IRB Approval
- Data Collection
- Data Analysis
- Conclusion

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BACKGROUND

- ❖ The COVID-19 pandemic magnified the need for individuals, communities, organizations and systems to develop capacity to access, acquire, understand and apply health information while adapting health behaviors rapidly, that is, to be health literate (Naccarella & Horwood, 2021).
- ❖ Limited health literacy has been associated with increased and longer hospitalizations, trouble managing chronic conditions, and higher mortality rates among the elderly (Berkman et al., 2011).
- ❖ When deployed in underserved communities, community health workers (CHWs) may serve as a critical Emergency Management Communication resource for communities and individuals in reducing potential exposures, identifying when to seek medical care, and accessing health and other resources in a time of massive disruption (Boyce & Katz, 2019).
- ❖ The purpose of this project is to operationalize an AI algorithm to identify vulnerable older adults at high risk for adverse outcomes in the event of a public health crisis and connect them with emergency prepared CHWs.

METHODS

Partnered with MedStar EMS Mobile Health Services

Embedded Age-Friendly Care Algorithm in Medstar EMR

Extracted Zip Code Data from Vulnerable 65 & Older Clients

Gathered Similar Data from Meals on Wheels & City of FW

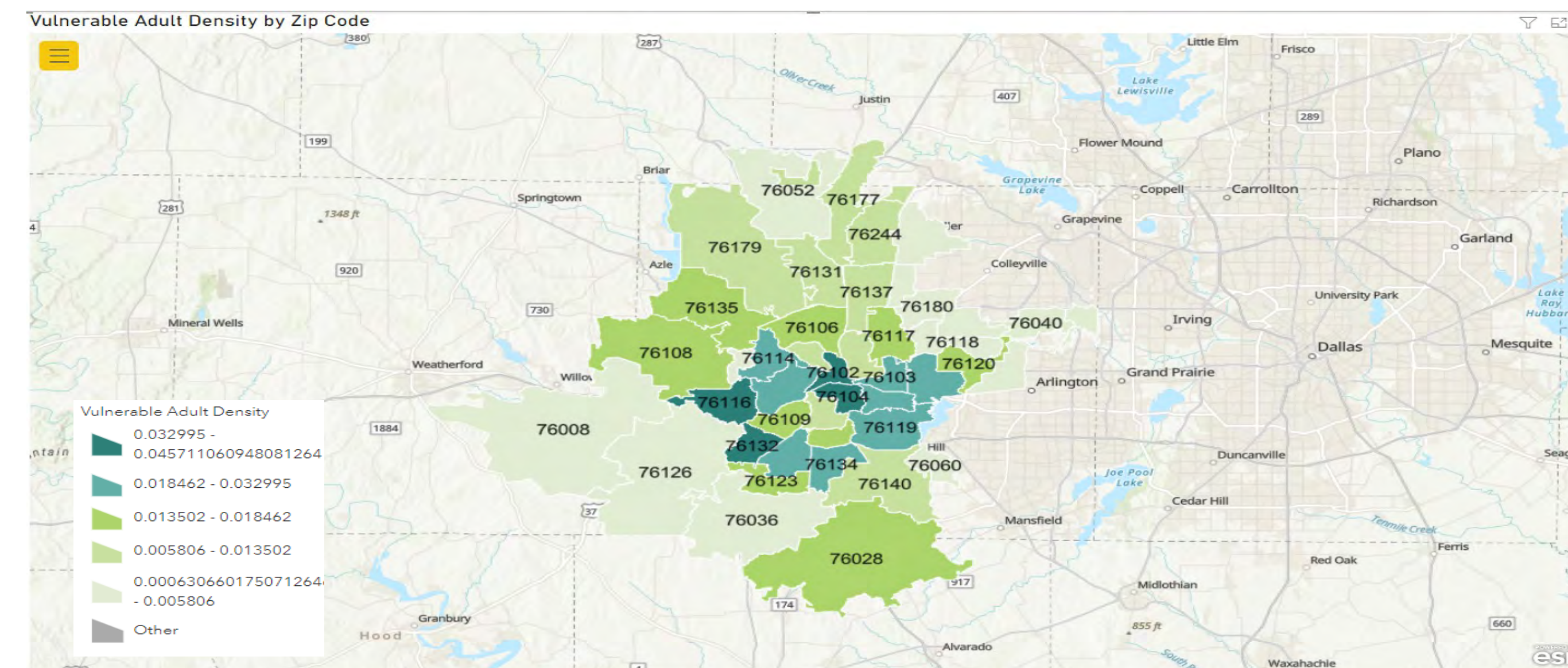
Heat Mapped Pockets of Vulnerable Seniors

Overlaid Zip Code Data of Existing CHWs for Gaps

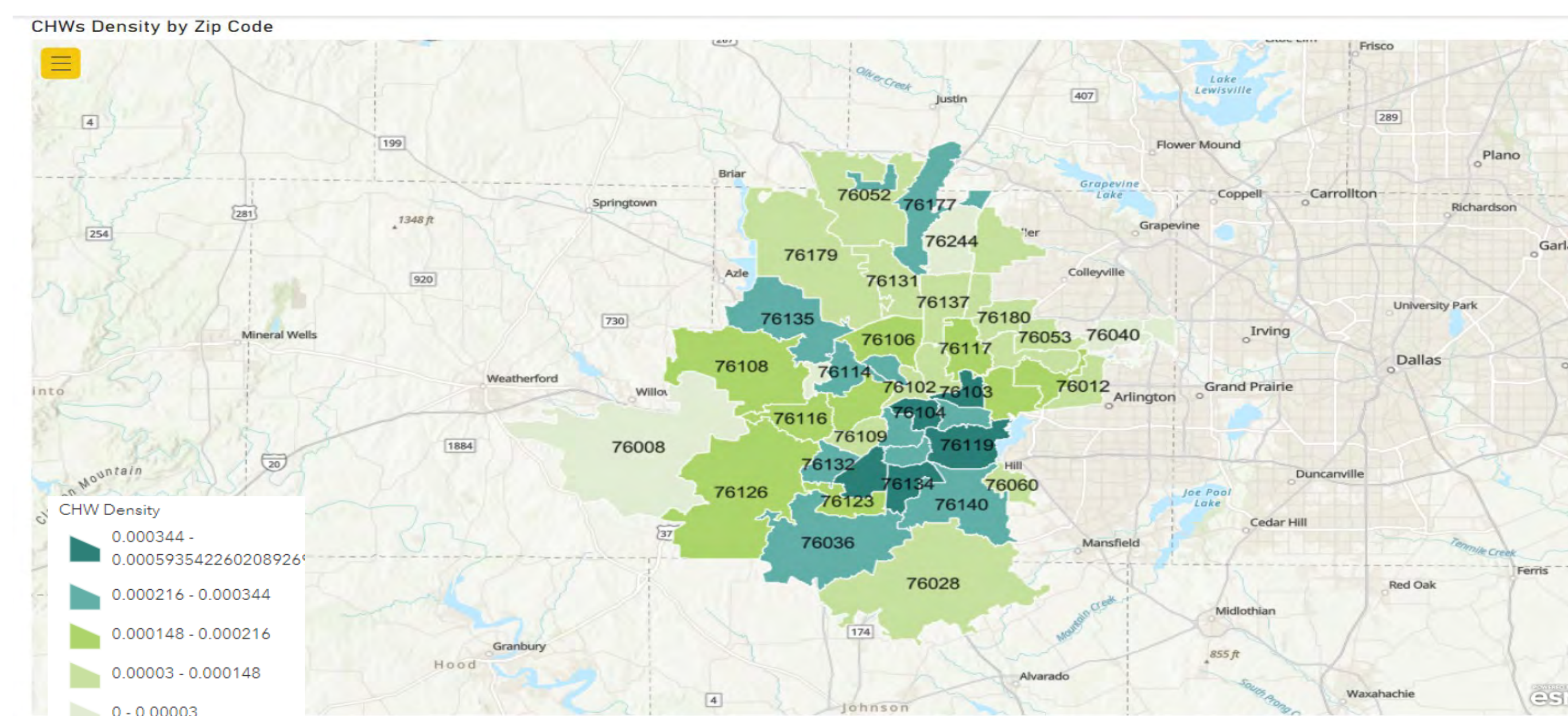
Currently Recruiting & Training New & Existing CHWs

RESULTS

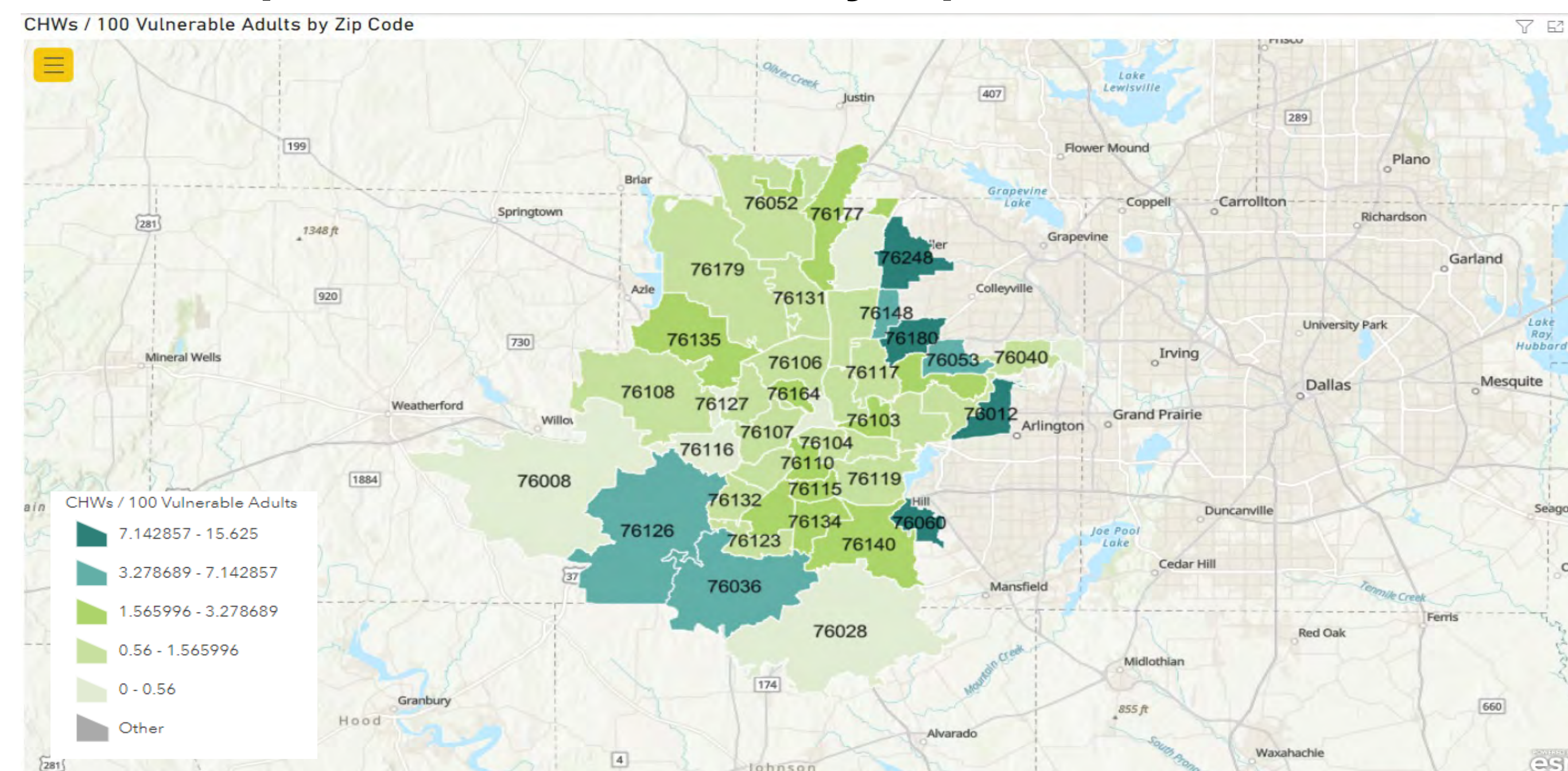
Vulnerable Older Adults by Zip Code



Community Health Workers by Zip Code



CHWs per 100 Older Adults by Zip Code



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RESULTS

Gaps in CHWs by Zip Code (HRSA Recommends 1-2)

Zip Code	CHWs / 100 Vulnerable Adults	Zip Code	CHWs / 100 Vulnerable Adults
76244	0	76179	1.395348837
76008	0	76040	1.449275362
76127	0	76052	1.492537313
76129	0	76131	1.565995526
76155	0	76135	1.719197708
76102	0.205761317	76133	1.830161054
76116	0.541516245	76115	1.928374656
76028	0.56	76103	2.049180328
76109	0.684931507	76177	2.054794521
76137	0.751879699	76134	2.083333333
76107	0.777202073	76164	2.173913043
76112	0.817438692	76110	2.558139535
76132	0.960512273	76140	2.578796562
76105	1.03626943	76118	3.278688525
76104	1.063829787	76148	4.109589041
76108	1.066666667	76053	4.255319149
76111	1.086956522	76126	5.405405405
76106	1.13452188	76036	5.921052632
76123	1.17820324	76060	7.142857143
76117	1.19760479	76012	11.11111111
76114	1.230769231	76248	12
76119	1.284796574	76180	15.625
76120	1.342281879		

- ❖ Gaps were identified in available CHWs in approximately 30 zip codes with high concentrations of older adults.
- ❖ As a result, SaferCare Texas set out to fill those gaps by:
 - 1) Recruiting and training new CHWs for gap areas.
 - 2) Recruiting and training existing CHWs in areas of need.
 - 3) Educating both cohorts in emergency response (4 FEMA Courses) and older adult care including digital literacy.
- ❖ This model aligns with the current Texas Association of Promotoras and Community Health Workers' (TAPCHW) efforts to embed CHWs in Texas' state public health emergency response.

DISCUSSION

- ❖ Disasters disproportionately impact the most vulnerable members of our communities, and oftentimes CHW's have or can develop pre-disaster relationships.
- ❖ CHWs work alongside other organizations to provide targeted preparedness messaging & identify post-disaster unmet needs.
- ❖ Texas communities are diverse, and CHW's often reflect the communities they serve to mediate potential trust issues.
- ❖ CHWs can provide translation services to help prevent non-English speakers from being left behind.
- ❖ CHWs can serve as volunteers forming in disaster recovery to fill disaster fatigue gap from COVID-19 and bringing reimbursement dollars to local & state areas through a cost-share agreement.

CONCLUSION

- ❖ AI can help abate health disparities by operationalizing data to prepare CHWs to serve in vulnerable populations prior to public health and other crises.
- ❖ This model serves as a replicable best-practice for underserved as well as rural areas lacking sufficient healthcare & emergency services across the country as they work prepare for the next public health crisis especially for older adult and vulnerable populations.

FACILITATING CRITICAL ROLE TRANSITIONS FOR MSN NURSE EDUCATOR STUDENTS

Patricia E. Thomas, PhD, APRN, CNE | Mari Tietze PhD, RN, BC-NI, FHIMSS, FAAN

INTRODUCTION

- EHRs promote patient safety, workflow efficiency, & communication.
- MSN Nurse Educator students are prepared to transition into academic and/or clinical educator roles after graduation.
- Clinical nurse educators are integral in ensuring the quality and safety of nursing care in hospitals and outpatient settings.

METHODS

- MSN Nurse Educator students in their final practicum course completed a database query activity in an academic EHR.
- Using the data generated, students developed teaching strategies to address health and safety issues identified from the query.

aEHR

Name: * ADE Analysis

Field(s): * * First Name * Last Name * Gender * MR# * Age * Type Of Insurance

Query Rules:

AND OR

Age greater or equal 65

Type Of Insurance equal Medicare

Query Summary

Total record(s): 118



TEACHING STRATEGY

Patient Safety 1st

General Hospital's Top 3 ADEs:

1. Wrong infusion rate (32%)
2. Wrong dose of medication (28.1%)
3. Medications given at non-scheduled time (14.3%)

Preventing Adverse Drug Events (ADEs)

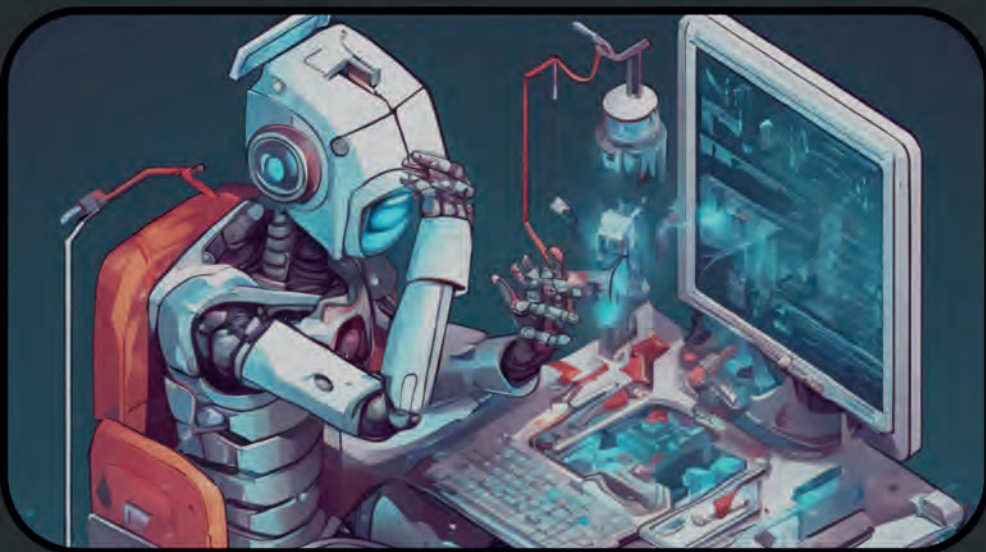
high-alert IV medications by having a second nurse validate the order, patient, dose/concentration, and pump programming (Wolf, 2018).

- Do not dispense orders with abbreviations for doses (Wolf & Hughes, 2019).
- When flow rate changes for same drug in IV, mix second bag for different rate of same drug (Wolf & Hughes, 2019).
- Do not mute alarms (Wolf & Hughes, 2019).
- Stop when hard stop on pump alerts trigger and call pharmacy (Wolf & Hughes, 2019).

PRELIMINARY RESULTS

- The majority of students reported that the aEHR activity enhanced their skills as a nurse educator and prepared them to teach EHR-specific skills to nursing students and/or new graduates.
- SUS scores reflected good usability of the aEHR¹.

¹Brooke, J. (1996). SUS: A quick and dirty usability scale. In P. W. Jordan, B. Thomas, BWeerdmeester, & I.L. McClelland (Eds.), *Usability Evaluation in Industry*. CRC Press.



FROM EPIC TO POWER APPS: TRAUMA PATIENT DISCOVERY

IMPROVED TRAUMA PATIENT DISCOVERY PROCESS
USING MICROSOFT POWER APPS

Colyn Turnbow BSN, RN, CEN, CCRN | Christopher McCarty MS, MBA, BSN, RN, NI-BC

Introduction

Trauma patient discovery is the process in which trauma programs identify patients that meet trauma registry inclusion.

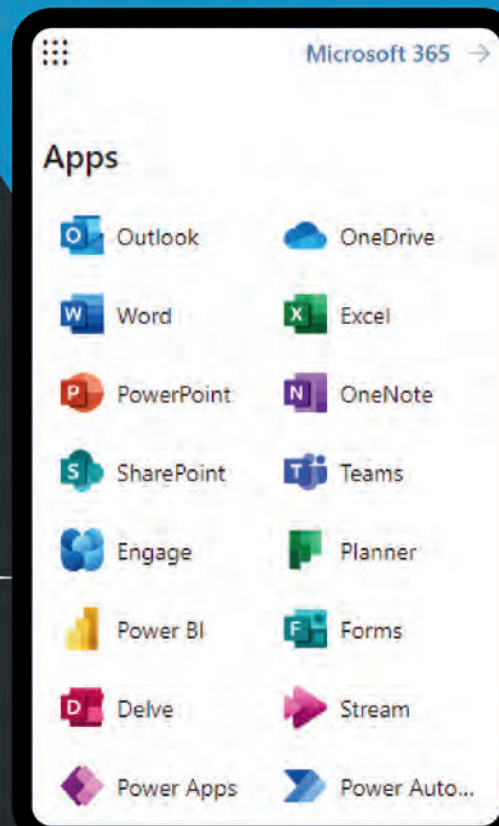
PROBLEM: Reviewing multiple reports and logs manually can be cumbersome, time consuming and have the capacity to produce errors.

Objective

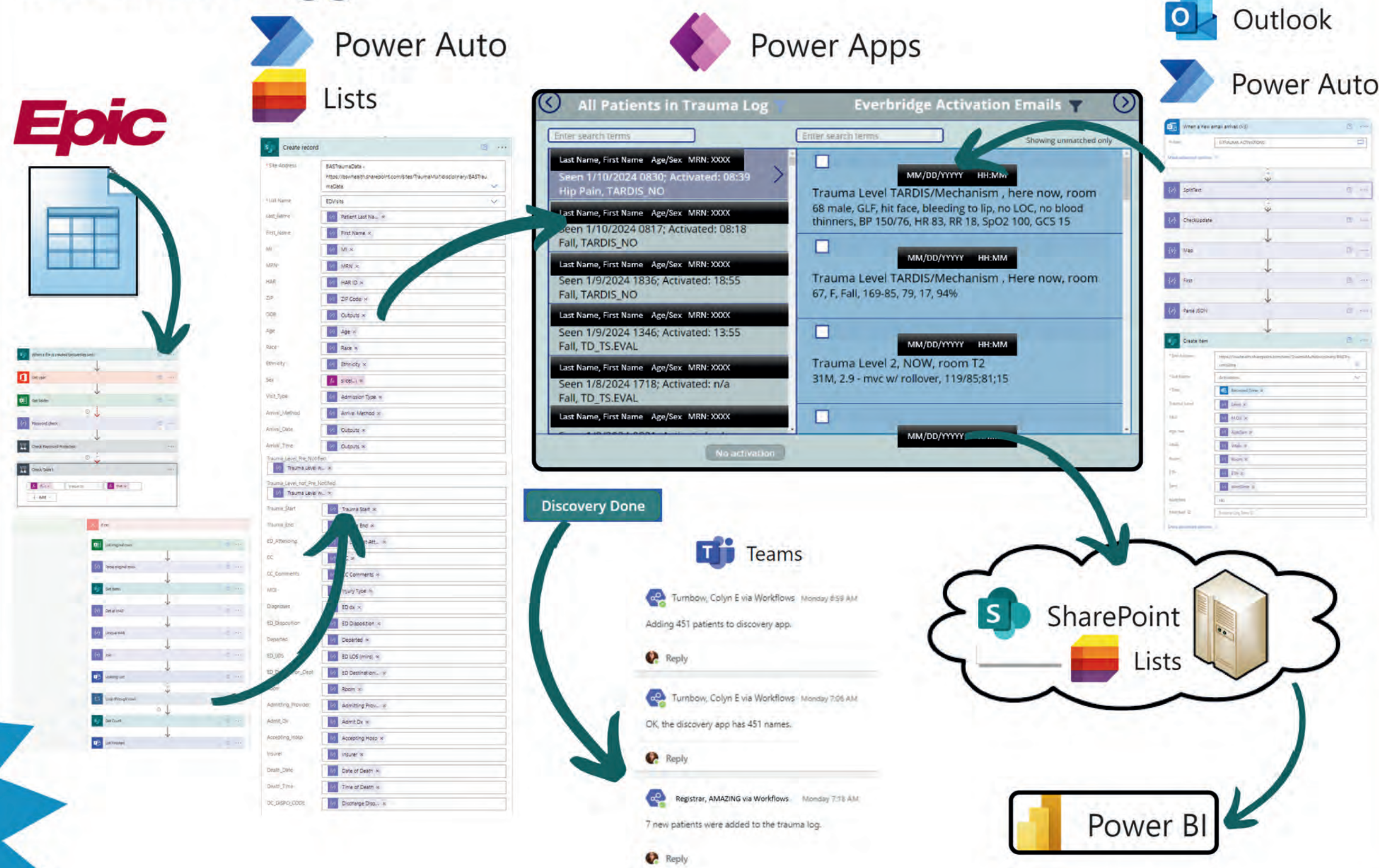
Creation of a Trauma Patient Discovery App utilizing Microsoft 365 tools, Epic export reports to improve capture of trauma activation or injured patients to place in trauma registry.

- Keep the workflow electronic

Utilizing Microsoft 365 Applications, Power Apps is a way to have multiple platforms feed into one application to easily filter and match data.



Methodology



Implications for practice

- Share ownership
- Create sharepoint list with data in mind to pull from Epic Flowsheets to match trauma registry
- Add Power App to team site for ease of access for involved team
- Team notification of discovery completion allows for communication to begin trauma abstraction and performance improvement review
- Investigate pagination for > 500 patients.



Results

Moved from manual process to electronic work flow
• **100% capture of trauma activation patients**

Ease of finding patients meeting registry inclusion criteria by adding search terms and filters from ED log in the Trauma Discovery Power App

Time-savings: requiring fewer people to review

Improved team communication - process is more transparent

Analysis

Data Quality

Time Savings and Efficiency

Improve Communication

Reduction of spreadsheets

Increase Revenue Capture

