



STRENGTHENING THE UTMB HEALTH INFORMATION SYSTEM TO REDUCE HEALTH DISPARITIES

DY6 PROJECT UPDATES AND SUMMARY

Center to Eliminate Health Disparities (CEHD)

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Project Updates



Introduction

The UTMB Center to Eliminate Health Disparities (CEHD) chose the REAL Data project on Race, Ethnicity and Language (REAL) disparities as one of its selected projects under the State of Texas 1115 Medicaid Waiver. The purpose of the project is to use the growing set of information resources in the hospital's electronic health record (EHR) and administrative data systems to identify disparities in health and health care in the UTMB patient population. The ultimate goal of this project is to improve the equitable delivery of high quality care to all racial and ethnic groups in our diverse patient population.

This is CEHD's final report that updates the previous findings, describes the activities done in DY6, and summarizes the lessons learned and the future plans. Consistent with the previous disparities reports and improvement plans, this DY6 report focuses on the racial disparities among UTMB patient populations including: non-Hispanic white, non-Hispanic black, and Hispanic patients. The first section updates the disparities study about breastfeeding practice. The second section updates the disparities study about heart failure. The third section updates the disparities study about type 2 diabetes.



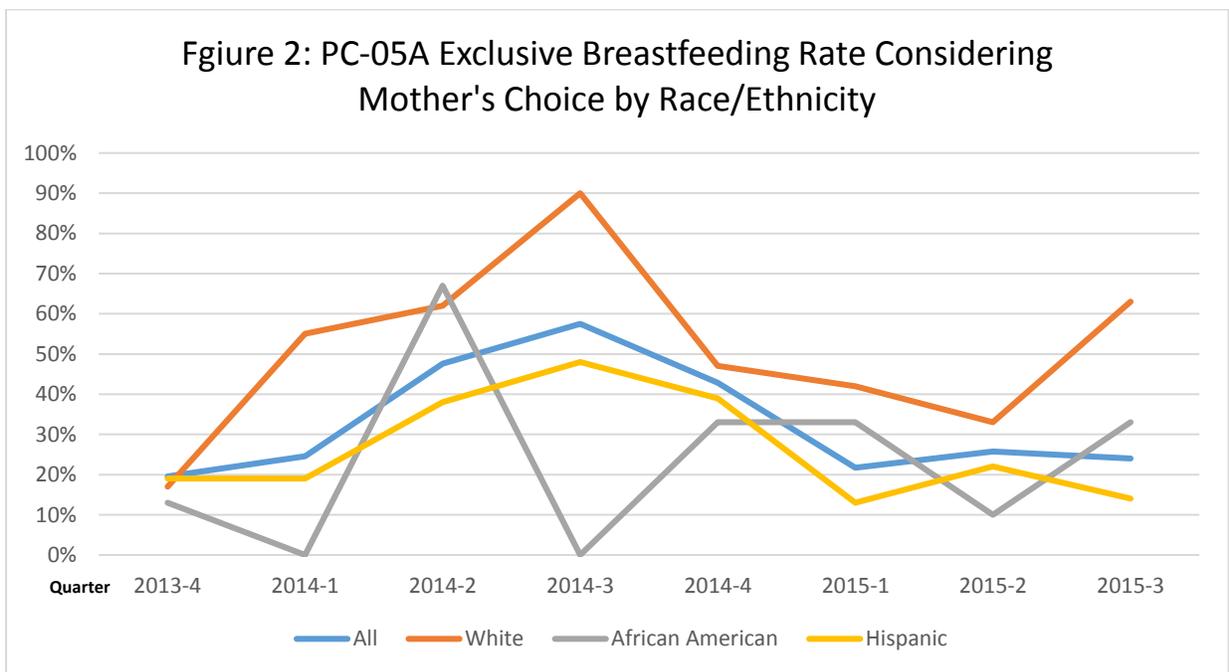
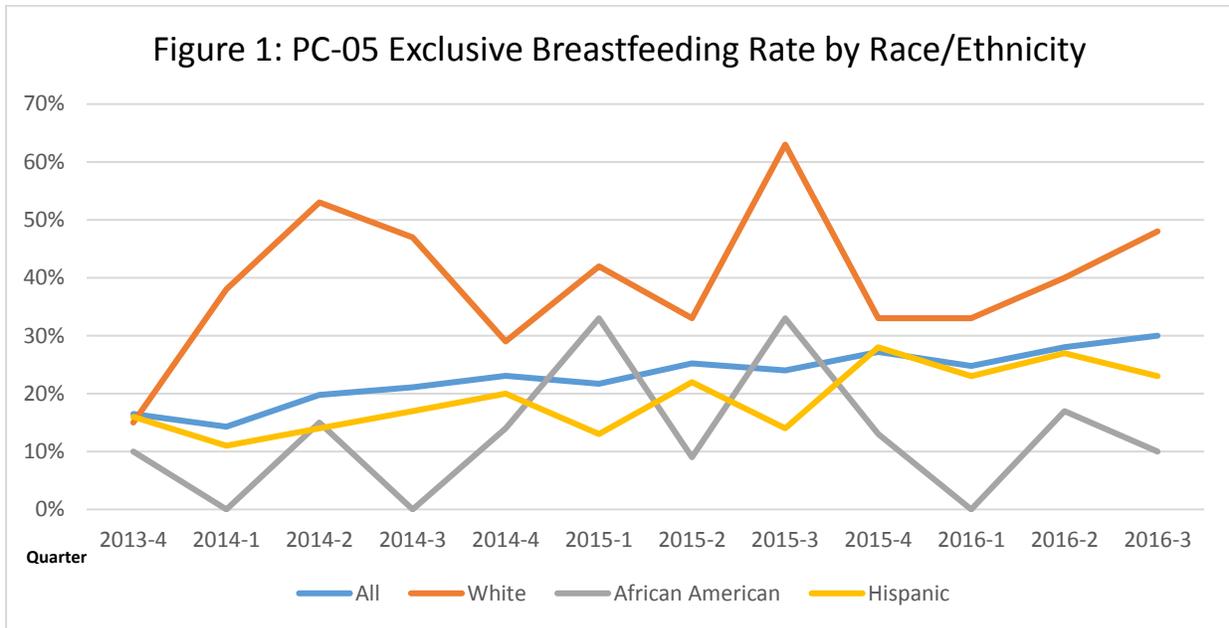
Updated Results of Breastfeeding Disparities

Since DY3, CEHD has identified racial/ethnic disparities in breastfeeding rates. The metric has been improved afterwards. Because the data period used in three successive reports (DY3, DY4, and DY5) are different, we focus on comparing the metric between DY4 and DY6 this time. The exclusive breastfeeding rate (PC-05) was 22% in DY4 and it increased to 26% in DY6. However, the rate dropped from 49% to 24% after considering mothers' choices. Also, both rates for non-Hispanic white and black mothers decreased from DY4 to DY6. The breastfeeding rate among African American mothers remains the lowest among three racial groups. More specific programs to support racial minorities to accept and practice breastfeeding are highly recommended.

Table 1. Comparing the Core Measures Performance between DY4 and DY6

Indicator Name	DY4 Report: July 1, 2014 – Dec 31,2014					DY6 Report: Jan 1, 2015 – Dec 31, 2016				
	At risk	All	Hispanic	White	Black	At risk	All	Hispanic	White	Black
IMM Immunization (end: 2015Q4)										
IMM-2 Influenza Immunization	189	85	86	87	79	1,302	87	100	.	.
CAC-3 Home Management Plan of Care (end: 2015Q4)										
CAC-3 HMPC Document Given to Patient/Caregiver	11	91	100	100	83	22	86	100	89	71
PC Perinatal Care Conditions										
PC-01 Elective Delivery	58	2	.	8	.	2,017	4%	7%	5%	4%
PC-02 Cesarean Section	130	27	20	27	46	1,138	29%	26%	34%	30%
PC-03 Antenatal Steroids	11	100	100	100	100	2,017	96%	100%	91%	96%
PC-05 Exclusive Breast Milk Feeding (EBMF)	213	22	18	37	6	774	26%	41%	17%	21%
PC-05a EBMF Considering Mothers Choice	96	49	43	64	20	333	24%	43%	26%	16%
VTE Venous Thromboembolism Prophylaxis										
VTE-1 Overall (end: 2015Q4)	181	97	97	98	95	977	96%	94%	96%	99%
VTE-2 ICU (end: 2015Q4)	78	97	100	96	100	977	95%	95%	97%	95%
VTE-3 Patients with Anticoagulation Overlap Therapy (end: 2015Q4)	60	95	100	95	93	977	92%	96%	88%	91%
VTE-4 Patients Receiving UFH Therapy w/Monitoring (end: 2016Q4)	57	100	100	100	100	1,239	95%	98%	94%	85%
STK Stroke										
STK-1 Venous Thromboembolism (VTE)	63	95	90	97	94	350	98%	98%	99%	100%
STK-2 Discharged on Antithrombotic Therapy	54	100	100	100	100	350	100%	100%	100%	100%
STK-3 Anticoagulation Therapy for Atrial Fibril/Flutter	4	75	100	100	50	350	100%	100%	100%	100%
STK-4 Thrombolytic Therapy	6	100	.	100	100	350	94%	91%	100%	100%
STK-5 Antithrombotic Therapy--Day 2	40	100	100	100	100	350	96%	97%	98%	89%
STK-6 Discharged on Statin Medication	41	100	100	100	100	350	99%	99%	100%	95%
STK-8 Stroke Education	35	100	100	100	100	350	98%	97%	100%	95%
STK-10 Assessed for Rehabilitation	63	100	100	100	100	350	99%	100%	100%	97%

Table 1 shows the updated core measures and highlights measures for which performance declined in orange. However, there are several limitations to the data. Many core measures were no longer assessed after 2015, so we drew two-year data to compare with the results in DY4. Next, the reporting system does not store data more than three years. That means the data before 2013Q4 is not obtainable. Third, the exclusive breastfeeding rate with consideration of mother's choice was not measured after 2015Q3. So the following figure depicts the trend of exclusive breastfeeding rate in general from 2013Q4 to 2016Q3. White patients had higher rates on both outcomes but African American patients had lower rates on both outcomes in most quarters.





Updated Results of Heart Failure Disparities

In DY5 we reported the disparities in patients with heart failure served by UTMB from 10/01/2011 to 09/30/2015. This report is updated to include the results of patients from 10/01/2015 to 06/30/2017. We used the same criteria to target the patient populations whose principal diagnosis is:

- ICD-10 (I501): left ventricular failure,
- ICD10 (I502, I5020, I5021, I5022, I5023): systolic heart failure,
- ICD10 (I503, I5030, I5031, I5032, I5033): diastolic heart failure,
- ICD10 (I504, I5040, I5041, I5042, I5043): combined heart failure,
- ICD10 (I509): unspecified heart failure.

Within the last seven quarters, UTMB has served 623 individual patients over 18 years old for a total of 821 encounters. The total number for advanced analysis includes 347 Non-Hispanic white patients, 178 Non-Hispanic black patients and 94 Hispanic patients. The number of Asian or other races is too small (=5 patients) so we excluded these groups.

Table 2. Updated Demographics of Patients and Encounters Relevant to Heart Failure Diagnoses

	Patient (N=619)	Encounter (N=817)
Race/Ethnicity		
Non-Hispanic White	347 (56.1%)	447 (54.7%)
Non-Hispanic Black	178 (28.8%)	252 (30.8%)
Hispanic	94 (15.2%)	118 (14.4%)
Gender (Female)	295 (47.7%)	386 (47.3%)
Age (Mean, Range)	67.4 [19,99] *	66.7 [19,99]
Primary Payer		
Commercial	65 (10.5%)*	76 (9.3%)
Medicare	413 (66.7%)*	539 (66.0%)
Medicaid	55 (8.9%)*	92 (11.3%)
Self-Pay	74 (12.0%)*	96 (11.8%)
Others (e.g. Military Veterans)	12 (1.9%)*	14 (1.7%)
Primary Diagnosis		
Systolic HF (ICD10-I50.2)	128 (20.7%)*	173 (21.2%)
Diastolic HF (ICD10-I50.3)	256 (41.4%)*	320 (39.2%)
Combined HF (ICD10-I50.4)	215 (34.7%)*	304 (37.2%)
Other Types (ICD10-I50.1 or I50.9)	20 (3.2%)*	20 (2.5%)
Source of Admission (Facility)	36 (5.8%)	38 (4.7%)
Status at Admission (Emergency)	522 (84.3%)	670 (82.0%)

Note: * Patient's information reported at their first visit at UTMB.

Compared to the DY5 report, UTMB saw more white and Hispanic patients in the most recent 7 quarters (white: 56.1% vs. 50.0%; Hispanic: 15.2% vs. 13.8%). Next, UTMB saw more female patients (47.7% vs. 45.4%), older (67.4 yd vs. 66.1yo), commercial plan (10.5% vs. 8.3%), Medicare (66.7% vs. 61.9%), diastolic HF (41.4% vs. 37.5%), combined HF (34.7% vs. 22.4%), and admitted at emergency (84.3% vs. 78.3%). The variation of patient characteristics may have multiple indications such as the health of Galveston residents is different, or the demographic itself is different. Additionally, the change from ICD-9-CM to ICD-10-CM may draw us different types of patient data. There is a need to follow up this trend and identify prevention strategies to target people at high risk.

The following table describes the different distributions among three different racial groups. Because the number of patients diagnosed with other types of heart failure is too small, we excluded those patients in the analysis. Also, the number of patients paying out of pocket for care or being covered by charity or other plan is too small to yield statistically meaningful measures. We merged both groups into one category for analysis. Overall, UTMB saw 334 whites, 172 African Americans, and 93 Hispanic patients in the past seven quarters.

Table 3. Updated Distributions of Visits Relevant to Heart Failure Diagnoses

	White	African American	Hispanic
Total Number of Individuals	334 (100.0%)	172 (100.0%)	93 (100.0%)
Principal Diagnosis at First Visit (p=0.058)			
Systolic HF	76 (22.8%)	35 (20.4%)	17 (18.3%)
Diastolic HF	148 (44.3%)	61 (35.5%)	47 (50.5%)
Combined HF	110 (32.9%)	76 (44.2%)	29 (31.2%)
Other types			
Gender (Female) (p=0.007)	139 (41.6%)	96 (55.8%)	48 (51.6%)
Age (Mean, Range) (p<0.001)	69.8 [33,99]	63.7 [22,97]	65.6 [19,97]
Total Number of Encounters	434 (100.0%)	246 (100.0%)	117 (100.0%)
Principal Diagnosis at Any Encounter (p<0.001)			
Systolic HF	100 (23.0%)	52 (21.1%)	21 (18.0%)
Diastolic HF	187 (43.1%)	75 (30.5%)	58 (49.6%)
Combined HF	147 (33.9%)	119 (48.4%)	38 (32.5%)
Primary Payer (p=0.032)			
Commercial	47 (10.8%)	15 (6.1%)	13 (11.1%)
Medicare	290 (66.8%)	165 (67.1%)	70 (59.8%)
Medicaid	40 (9.2%)	38 (15.6%)	12 (10.3%)
Self-Pay & Others	57 (13.1%)	28 (11.4%)	22 (18.8%)
Source of Admission (Facility) (p=0.498)	20 (4.6%)	10 (4.1%)	8 (6.8%)
Status at Admission (Emergency) (p=0.278)	348 (80.2%)	209 (85.0%)	94 (80.3%)

Among three racial groups, a higher portion of African American patients are female and younger than 65. However, a lower percentage of Hispanic patients were covered by Medicare compared to African American patients. In addition, a higher portion of African Americans were diagnosed with combined heart failure, which is the most severe type of HF and costs the most. Compared to whites and Hispanics, a lower percentage of African Americans were covered by commercial plans but a higher percentage by Medicare and Medicaid. Finally, there is no statistically significant difference in other variables such as source of admission.

The following table illustrates the different outcomes based on race/ethnicity and type of heart failure. The outlier was excluded before we fitted the two-way ANOVA model. We aim to identify racial differences within the same type of heart failure. For example, we found that Hispanic patients had longer length of stay than the other two races for the same admission cause, systolic HF. Likewise, African American patients spent more money if they were diagnosed with combined HF. The graphs also depict the distribution for each health outcome.

Table 4. Updated Service Outcomes Relevant to Heart Failure Diagnoses by Race/Ethnicity

Risk-Adjusted Mean and Standard Error	White (N=431)	African American (N=246)	Hispanic (N=117)
Average LOS/Visit (Days)			
(p=0.0452)			
Systolic HF	6.67 (0.74)	6.94 (0.90)	7.51 (2.08)
Diastolic HF	5.39 (0.21)	5.34 (0.29)	5.05 (0.24)
Combined HF	5.92 (0.38)	7.09 (0.65)	6.74 (1.10)
Average Direct Cost/Day (\$)			
(p<0.001)			
Systolic HF	1657.52 (117.23)	1625.22 (150.85)	1532.79 (178.66)
Diastolic HF	1185.14 (29.11)	1189.27 (28.97)	1149.79 (22.71)
Combined HF	1520.19 (84.99)	1577.54 (114.17)	1547.90 (132.81)
Mortality (Ratio) (p=0.0749)			
Systolic HF	0.034 (0.010)	0.018 (0.004)	0.010 (0.003)
Diastolic HF	0.017 (0.003)	0.009 (0.001)	0.006 (0.001)
Combined HF	0.023 (0.005)	0.029 (0.009)	0.016 (0.003)
90-Day Readmission (Yes/No)			
(p=0.3257)			
Systolic HF	16 (23.2%)	12 (27.3%)	3 (15.0%)
Diastolic HF	27 (39.1%)	7 (15.9%)	9 (45.0%)
Combined HF	26 (37.7%)	25 (56.8%)	8 (40.0%)
6-Month Readmission (Yes/No)			
(p=0.1923)			
Systolic HF	3 (13.6%)	17 (27.4%)	3 (13.6%)
Diastolic HF	10 (45.5%)	12 (19.4%)	10 (45.5%)
Combined HF	9 (40.9%)	33 (53.2%)	9 (40.9%)

Note: Risk-adjusted mortality ratio is the actual number of inpatient deaths that occur in the hospital during a specific period divided by the predicted number of deaths according to

patient's severity of illness. If a risk-adjusted mortality ratio is less than 1.0, that means fewer patients died than expected in this hospital based on the performance of other hospitals adjusted for patients with the same types and severity of medical problems.

Figure 3. Average Length of Stay (LOS) for Each Racial Group with Different Principal Diagnosis

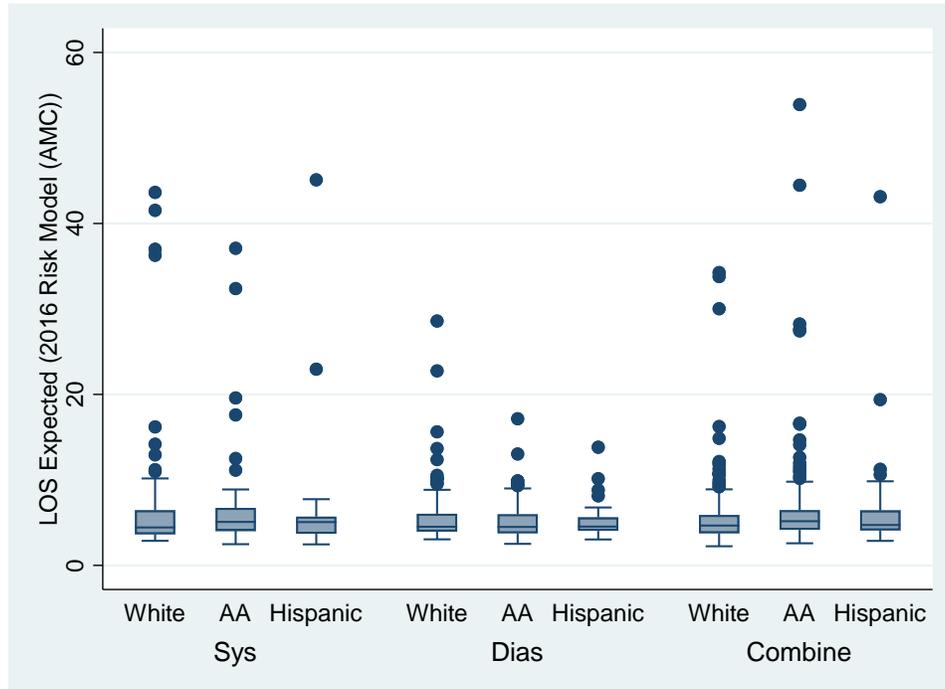


Figure 4. Cost per Day (\$) for Each Racial Group with Different Principal Diagnosis

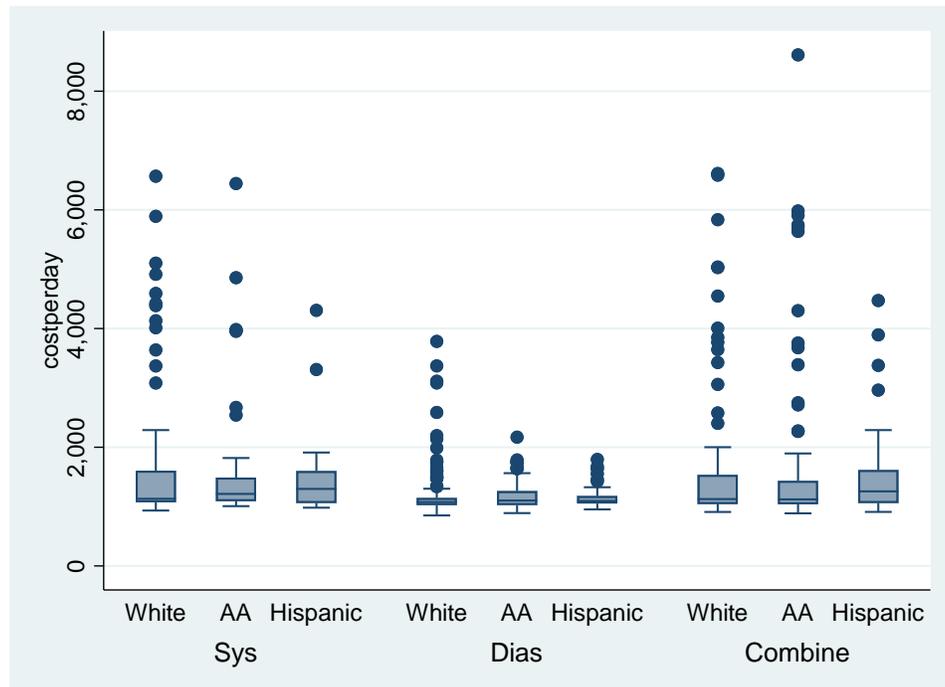


Figure 5. Likelihood of 90-Day Readmission for Different Race/Ethnicity with the Same Diagnosis

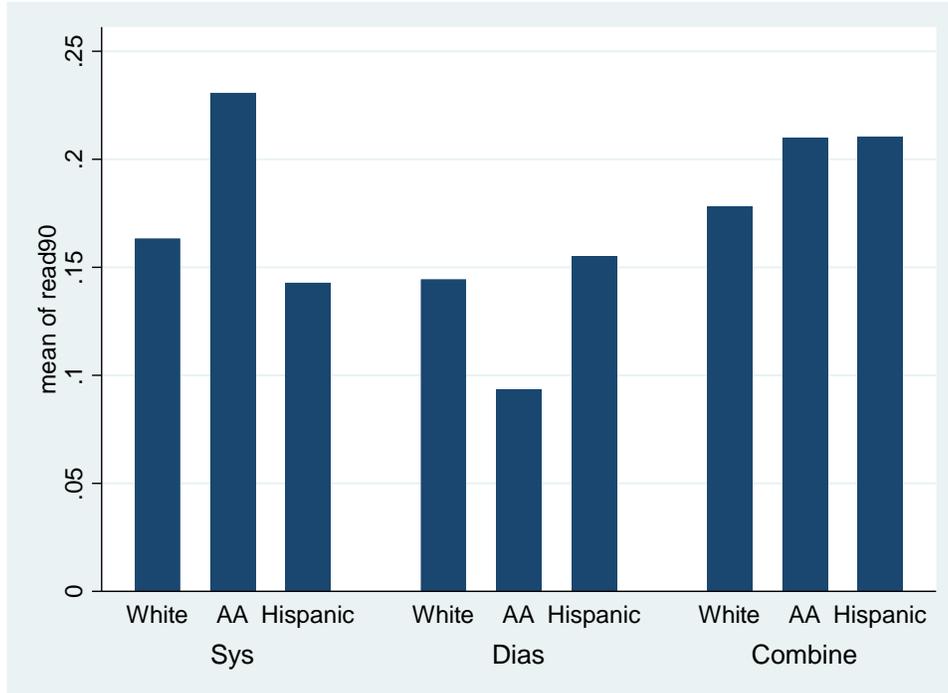
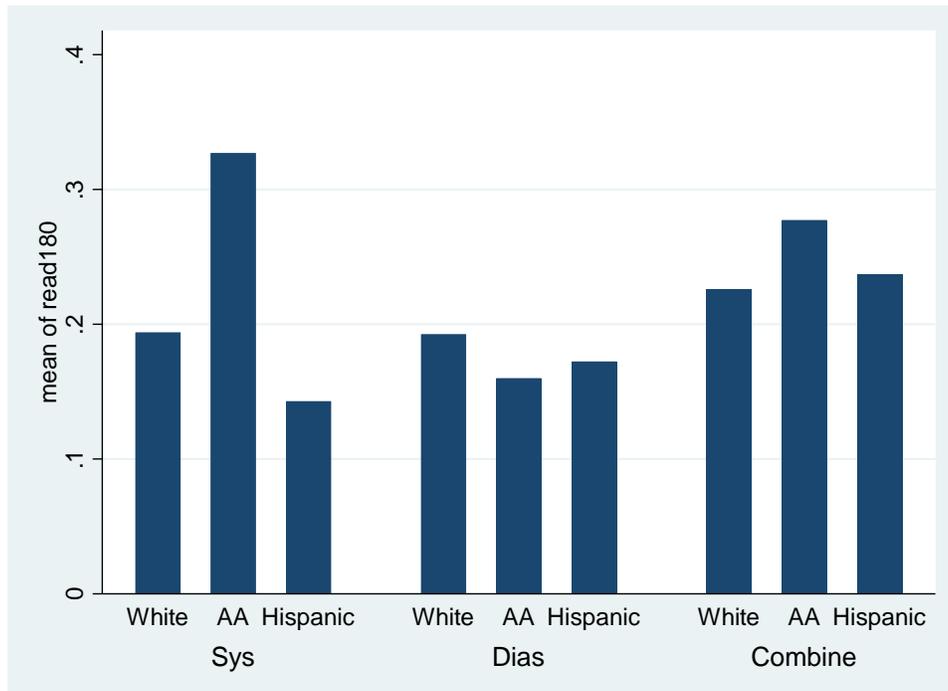


Figure 6. Likelihood of 180-Day Readmission for Different Race/Ethnicity with the Same Diagnosis



Finally, we included covariates one by one to identify the racial differences in different outcomes. The outcomes of interest are length of stay per visit, cost per day, 90-day readmission rate, and 180-day readmission rate. Without covariates, we did not see any statistically significant difference. After gradually adding the type of heart failure, admission source, and admission status, there is no racial difference either. For a full model, we see (1) the diagnosis and admission status affect the length of stay, (2) diagnosis, admission source, and admission status affect the cost per day, and (3) admission status affects the 90-day rate. Unexpectedly, patients who were admitted in an emergency status stayed shorter, spent fewer, and were less likely to be readmitted within 90 days. Especially when the admission status is not related to mortality rate and the outcome has been adjusted for insurance plan, it is necessary to explore more about how admission status predicts patient’s outcomes.



Update Results of Type 2 Diabetes Disparities

In the DY5 report, we extracted 22,087 patients’ data from 1/1/2012 to 3/31/2016 to assess the disparities among patients with type 2 diabetes (T2D):

- (1) Race/Ethnic differences in the prevalence of macrovascular associated comorbidities of Type 2 diabetes: hypertension, ischemic diseases, and stroke;
- (2) Race/Ethnic differences in the prevalence of microvascular complications of Type 2 diabetes: retinopathy, ophthalmic conditions, and neuropathy; and
- (3) Race/Ethnic differences in Body Mass Index (BMI) and the use of insulin.

We extracted 20,680 patient data from 1/1/2012 to 3/31/2017 to update our findings. The total number of patients is fewer in DY6 possibly because some patients might have passed away or moved to new place, and the diagnosis criteria has changed from ICD-9 to ICD-10. Regardless of the number, we still find the same racial disparities in macrovascular and microvascular complications particularly experienced by African American patients. We will continue to monitor this issue and recommend more interventions to help African American patients manage their diabetes.

Table 5. Updated Demographics of Patients with Type 2 Diabetes

	White	Black	Hispanic	Total
Gender				
Male	5,099	2,079	2,397	9,575
Female	4,823	2,619	3,663	11,105
Age in 2016				
18~44	1169	682	1420	3271
45~64	4382	2373	2930	9685
65+	4371	1643	1710	7724
Insurance in Last Visit				
Charity or Indigent	658	823	1619	3100
Commercial	4350	1386	2020	7756
Medicaid	657	578	647	1882

Medicare	4257	1911	1774	7942
Language				
English	9884	4696	4309	18889
Spanish	21	0	1749	1770
Others	17	2	2	21
Tobacco in LV				
Did not ask	1996	761	1106	3863
Never	2938	1612	2770	7320
Former User	3331	1618	1625	6574
Current User	1657	707	559	2923
Alcohol in LV				
Did not ask	574	299	346	1219
No	3544	1970	3035	8549
Yes	2629	1033	1136	4798
Illegal Drug in LV				
Did not ask	1149	498	594	2241
No	5234	2562	3717	11513
Yes	257	224	158	639

Table 6. Updated Demographics of Patients with Type 2 Diabetes with Age Standardization

Complications or Comorbidities	White		Black		Hispanic	
	Crude rate per 100	Age-standardized rate per 100	Crude rate per 100	Age-standardized rate per 100	Crude rate per 100	Age-standardized rate per 100
Ischemic	22.9%	21.1%	23.0%	23.1%	16.4%	19.4%
Stroke	3.3%	3.0%	4.4%	4.5%	2.2%	2.6%
Hypertension	31.4%	30.8%	41.7%	41.5%	30.4%	32.5%
Renal diseases	9.3%	8.9%	13.4%	13.6%	10.4%	11.4%
Ophthalmic	7.2%	7.1%	12.8%	12.8%	11.9%	13.1%
Neurological	16.9%	16.2%	18.1%	18.1%	11.3%	12.7%
Obesity Stage 1 or 2	59.7%	61.0%	62.6%	62.3%	60.0%	57.4%
Insulin	48.6%	48.9%	52.9%	53.1%	49.7%	50.1%

DY6 Activities



Focus Group Discussion “Addressing Health Disparities through Using Community Health Workers and Promotores (CHW/Ps) in Galveston County”

Abstract

Objective: The purpose of this research is to inform ways to strengthen outreach programs to monitor and address social determinants of health. In addition, it examines the feasibility of using existing community health workers or *promotoras* (CHW/Ps) in Galveston County to implement future interventions to reduce health disparities.

Materials and Methods: With the list of certified CHW/Ps provided by Texas Department of State Health Services, we successfully recruited 11 participants (7 attending the first Focus Group Discussion session and 4 attending the second Focus Group Discussion) in 2017. Ten open-ended questions were used to understand their working experience in Galveston County and challenges they confronted in their work. All responses were transcribed into one written script and cross-reviewed by two different investigators. The responses were also evaluated using qualitative coding to identify key themes.

Results: Overall 11/13 people we contacted have participated in one of two Focus Group Discussion sessions. One of 11 participants was retired, one unemployed, and the rest have jobs. Most of them are serving uninsured or patients covered by Indigent Health Plans. From their responses, three themes were emerged: inadequate local recognition, shortage of community resources, and insufficient financial resources.

Discussion and Conclusion: It is important to acknowledge CHW/Ps’ roles in our communities and leverage their strength to reduce health disparities. The study highlighted some disadvantages to serving in Galveston as a CHW/P. More supporting resources may benefit their work and eventually benefit the community as a whole.

First Finding: Inadequate Local Recognition

When the participants were asked about the status and capacity of CHW/Ps workforce in Galveston compared to other areas, most agreed that healthy systems in Houston areas provide better recognition to the contributions of CHW/Ps. One of them mentioned another training center in Texas saying, “the university pasted around hiring CHWs and they seem to get more CHWs than Galveston.” In addition, most participants thought there are more training resources and programs in Houston such as Texas Gulf Coast CHW/Promotores Association (TGCCPA) which holds the annual meeting in Houston.

Most participants believed that they are well acknowledged and appreciated by patients but not by health systems. One participant said, “We are considered professionals, but a lot of people regard us as secretary or assistant.” She went with her patient to a doctor’s visit where she was treated like the patient’s assistant. However, she felt that “we are the bridge between hospital and community. We help patients understand the medical instruction which improves patient’s compliance.” Since there is no leading organization in Galveston, the participants told us they barely have a chance to know other fellow CHW/Ps until they came to our FGD session. They are very much looking forward to having more group sessions to meet their peers.

Second Finding: Shortage of Local Resources

When the participants were asked about the challenges that they confronted in their works, they pointed out a couple of issues including: transportation, health insurance, and access to different types of health services. Transportation appears to be a big barrier because on the Island, there is only one public bus system affordable for low-income families. “If a mother needs two car seats for her two kids, she is unlikely to take bus to go to UTMB to see the doctor,” said by one participant. Likewise, when a patient is referred to other clinics outside of the Island, s/he is unlikely to go. As a result, some participants mentioned that they give rides to their patients in Galveston.

Health insurance is another barrier for individuals (1) who could not fill in the application form by themselves, (2) who do not have legal documentation in the US, (3) whose employers do not provide insurance, or (4) who have pre-existing conditions that most insurance payers reject to cover. “We help patients to fill in the application for Medicaid because they don’t read or write and it takes 45 minutes to fill in,” said one participant. The current solution for uninsured individuals is using charity funds but one participant stated that her patient decided to move to Houston because there is no help in Galveston.

One of a CHW/Ps’ main functions is to navigate patients to accessible service providers. However, several participants said there are limited resources in Galveston. For example, two clinics on the Island offer free primary care and one non-for-profit organization offers free medical equipment like wheelchairs for the low-income or homeless individuals. But if a patient needs to see a specialist, or needs high-tech medical exams, there is no place to go. Some participants discussed other challenges to helping patients manage their health including that some neighborhoods are unsafe for physical activity, Hispanic culture hinders men from seeking healthcare, and that patients stigmatize mental illness.

Third Finding: Insufficient Financial Resources

Finally, when the participants were asked about their suggestions for a community-driven model utilizing CHW/Ps, they believe it needs a stable financial resource. Most participants are funded by grants, which means their position ends once the grant ends. Some participants have a full-time position like patient registration or patient navigator in different organizations. However, their organizations do not have funding to hire more CHW/Ps either. Also, some of the participants mentioned losing follow-up with their patients when the patients were not eligible for any financial assistance because resources for patients are limited or not covered by insurance plans. In short, the participants expressed their desire for a more supportive environment in Galveston County.

Recommendations for Next Steps

CHWs programs have shown the ability to build partnerships with communities, community based organizations, academic institutes, healthcare providers and policy makers at the local level, moving towards coordinated, community-driven action to address the root causes of disparities (Brennan Ramirez et al., 2008; DHHS, 2016). Our research findings suggest that the development of a CHW/P-led outreach program should adopt a comprehensive view of

Galveston County’s resources in comparison with the overall needs of the local communities. For example, referrals across two clinics could be enhanced by a connected transportation system. Mutual learning between CHW/Ps and other types of providers is also useful to improve patient-centered and community-based service delivery. Most importantly, actively engaging CHW/Ps in health systems will increase resident satisfaction with the neighborhood as a place to live and subsequently improve the macro-socioeconomic environment as a whole.

This research summarized the responses from 11 CHW/Ps but did not distinguish the differences between two FGD sessions. The dynamic in the second FGD session was not as significant as the first FGD session. Future studies using the FGD method may be more cautious of this influential factor. Another limitation of this study is that we do not have any baseline or preliminary data about the CHW/P programs in Galveston County. As the participants stated, the programs come and go depending on the availability of funding and there is no leading organization to coordinate the various efforts. We relied on the information provided by the current certified CHW/Ps but we were not able to reach those with expired certificates or those who moved to other places. Our future plan is to interview the employers of the CHW/Ps we met this time. The information from the employers who acknowledge the strength of CHW/Ps may encourage more organizations and policy makers to adopt the model utilizing CHW/Ps in the future.



Survey about Perspectives of “Integrating Data on Patient’s Demographic Characteristics and Social Determinants into the Electronic Medical Record (EMR)”

At the end of DY6, the project team conducted a survey to investigate UTMB employee, faculty, and student perspectives on collecting social determinants of health. The survey also investigated which collection method the respondents recommend and various benefits of learning to use social determinants data. Overall, the survey received 184 valid responses (Table 7). More than a half of respondents are from clinical service areas. The second largest group is administration staff. Although patient registration specialists shall be counted as administration side as well, some did not understand the category fully and chose “other” category that separates themselves from “administration” category.

Job area	Number	Percentage
Clinical Services	105	57%
Administration	47	26%
Researchers	9	5%
Patient Registration Specialists	10	5%
Students	5	3%
Other	8	4%
Total	184	100%

The Importance of Collecting Patients’ Demographic and Socioeconomic Data

Figure 7 shows that three-quarters (74 percent) of respondents ranked questioning patients about transportation to health care facilities as important (with a score of 4/5 or 5/5) followed by race and employment status (69 percent), gender identity (62 percent), and marital status (60 percent).

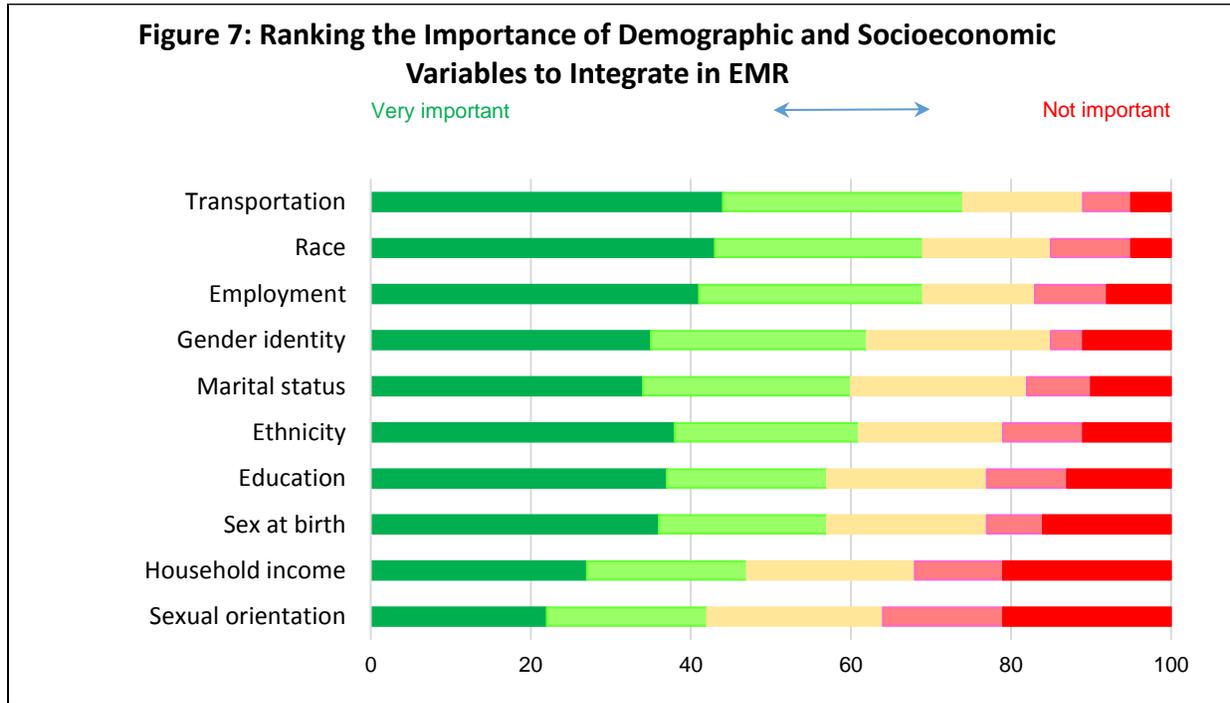


Table 8 shows that the mean score of all respondents to all 10 suggested variables is 3.63/5 which is higher than the mid-point (2.5), i.e. they generally considered collecting data on all suggested items is important. Ranking respondents (categorized by their job area) according to the mean score places researchers at the top of the list with a score of 4.17/5. Those who self-identified with the administration job area gave the lowest mean score (3.44/5).

Table 8: The Reported Importance of Integrating Demographic and Socioeconomic Data by Job Area		
Job area	Mean score	Number
Researchers	4.17	9
Others	3.86	8
Students	3.86	5
Clinical services	3.65	105
Patient Registration Specialists	3.47	10
Administration	3.44	47
All	3.63	184

Most of the comments given by respondents could be categorized under three themes/concerns:

The complexity of concepts and measures: Respondents reported a concern about the complexity of choices under each variable. The question is should we give patients choices that are easy to conceptualize or focus on sensitive indicators to measure each variable. For example, reported household income within certain categories might not provide a sensitive measure for economic status unless it was combined with several other measures including household size, available in-kid support for the family, etc. Many respondents commented on having 'unknown' as a choice while asking about race and ethnicity. They suggested replacing it with 'do not prefer to report'. This will ensure that patients have an absolute right to decline reporting this type of information and could result in more accurate results when stratifying by race/ethnicity.

Justification: Respondents reported that patients could raise concerns about the rationale of collecting these types of data and their relation to health care.

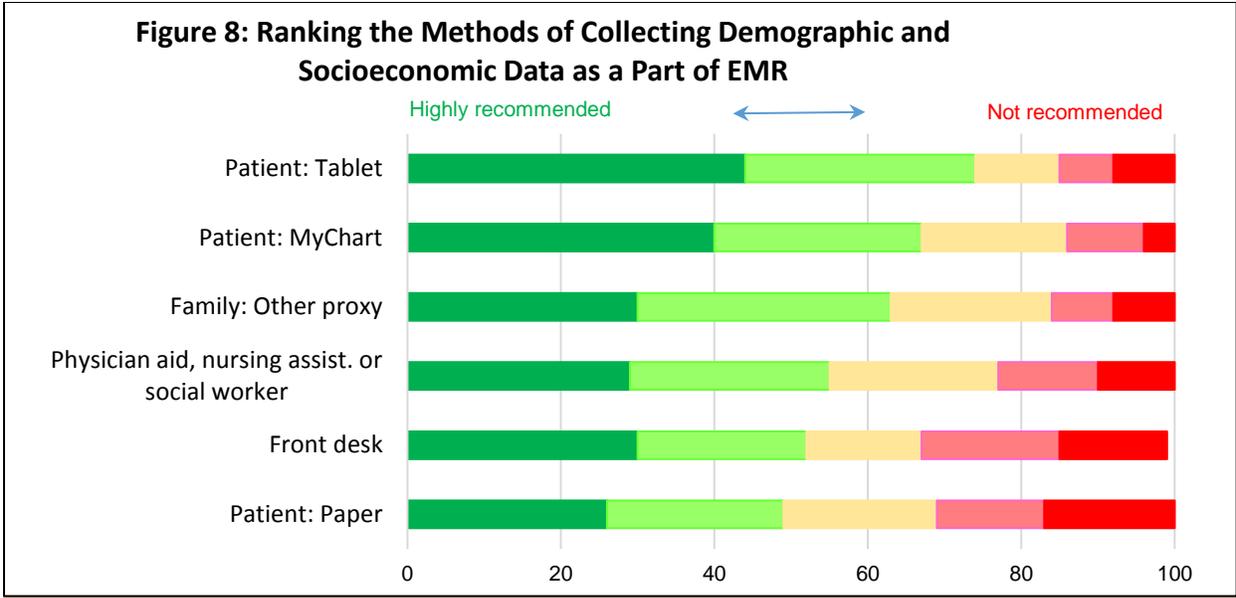
Potential source of bias: Some respondents suggested that knowing patient socioeconomic data, choices or preferences may create a potential source of bias among health care service providers.

Respondents also suggested a long list of other demographic and socioeconomic variables to be integrated with EMR. These included:

- Preferred identity and name (What does the patient want to be called?)
- Food insecurity and food stamps
- Health literacy level
- Diet, fitness and health goals
- Literacy
- Military service
- Willingness/interest to participate in research studies
- Preferred language/English fluency
- Social support and networking beyond marital status

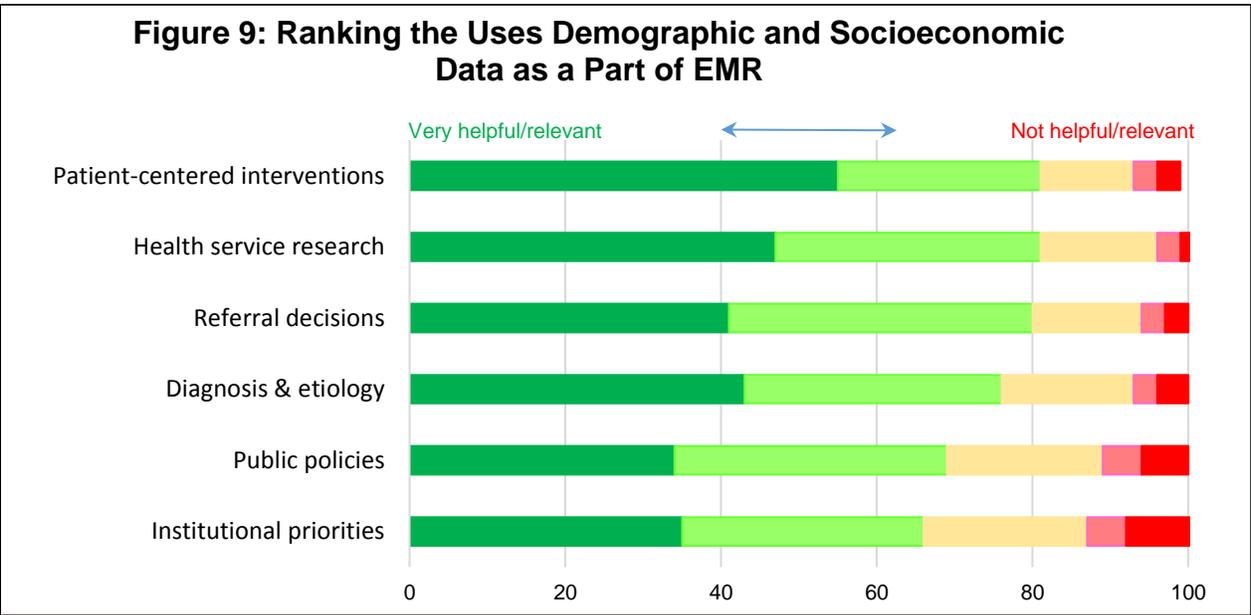
Methods of Data Collection

Respondents ranked data collection methods that encourage patient self-reporting using electronic devices highest. Figure 8 shows that three-quarters (74 percent) of respondents recommended patient self-reporting using electronic tablets, followed by patient self-reporting using MyChart, UTMB's secure electronic way for patients to access their medical record (67 percent). Respondents felt these methods would provide the highest level of privacy and confidentiality and shorten time spent collecting and managing data. Conversely, respondents ranked collecting data by interviewing the patient at the front desk and asking the patient to report by completing a paper form lowest for the same reasons.



The Use of Demographic and Socioeconomic Data

The questionnaire suggested six specific uses for demographic and socioeconomic data and asked respondents to score each from (1) as least important to (5) as most important. Figure 9 shows that each suggested use was scored helpful/relevant (4/5 or 5/5) by at least 66 percent of respondents. Topping the list was using the data in designing patient-centered interventions and conducting “health service research” (81 percent). “Supporting referral decisions” ranked second with 80 percent, followed by “assisting the diagnosis”. Informing public policy and “institutional priorities” rounded out the list, both receiving a score of 4/5 or 5/5 by two-thirds or more of respondents.



Project Summary



Project Accomplishments

Key Achievements during the Last Six Years

- Optimizing the registration system and training of registration staff to collect REAL data.
- Significant improvement in collecting valid REAL data - from 63% (2013Q4) to 95% (2016Q2).
- Increased number of Medicaid and Low Income Uninsured (MLIU) patients from 28.82% (DY3) to 37.01% (DY6).
- Identifying disparities through analyzing the UTMB inpatient records and developing improvement plans. This includes the development of a model for addressing disparities.

Disparity Documentation and Improvement Plans

CEHD produced two disparity documentation reports as a part of the reporting requirements of the REAL Data Project. The first report identified three disparities in UTMB's patient population:

- **Low breastfeeding rates among African American and Hispanic females.** Breastfeeding is not a common practice among mothers who give birth at UTMB. Only 15% of all infants born at UTMB hospitals between July 1, 2013 and June 30, 2014 were exclusively breastfed during the entire hospital stay. Stratification by race and ethnicity reveal significant disparities in the practice of breastfeeding. Whereas 34% of White newborns were breastfed during the entire hospital stay, only 11% of African American and 12% of Hispanic newborns were breastfed during the entire hospital stay.
- **High rates of low birth weight among African American females.** African American females at UTMB give birth to low birth weight newborns at a higher rate than all other races and ethnicities. Whereas 9.2% of all newborns at UTMB during the study period were of low birth weight, the percentage of low birth weight newborns of African American mothers was 17.5%. By contrast, the rates were 15.3% for newborns of Asian mothers (also high), and 10.4% for newborns of White mothers. At 7.1%, the rate of low birth weight newborns of Hispanic mothers was the lowest of all racial and ethnic groups at UTMB.
- **High rates of ambulatory care sensitive conditions (in hospital encounters) among African Americans.** During the study period, the rate of ACS conditions among hospitalized patients was 13.8% (26.4% among African American patients, 16.2% among Hispanics patients, and 11.3% among Asians patients). The relatively high rate among African American patients is statistically significant compared to all the other race/ethnic groups. Cases of heart failure and pulmonary edema contributed to 37% of avoidable hospitalizations, followed by cases of diabetes mellitus (22%), chronic obstructive pulmonary diseases (15%), grand mal status and other epileptic convulsions (10%), asthma (8%), hypertension (6%) and angina (1%).

The second disparity documentation report identified the following disparities in the UTMB heart failure patient population:

- **Higher percentage of combined (systolic and diastolic) heart failure among African Americans hospitalized for heart failure at UTMB.** Using ICD-9-CM codes to stratify each racial group within the UTMB inpatient population with heart failure as a primary diagnosis by type of heart failure showed that 30.4% of African American patients had combined heart failure (systolic and diastolic), the most severe type of heart failure. The percentage of combined heart failure was 21.2% in White and 21.6% in Hispanic patients.
- **Higher rates of 6-month readmissions among African Americans hospitalized for heart failure at UTMB.** Comparing the interval between each two hospitalizations for each racial group showed that African American patients were more likely to be readmitted within 6 months. The 6-months readmission rate was 29.5% in African American patients compared to 23.3% and 20.1% for Hispanic and White patients respectively.
- **Longer length of stay among African Americans hospitalized for heart failure at UTMB.** The risk-adjusted average number of hospitalization days was higher in African American patients hospitalized with heart failure (7.1 days) compared to only 6.1 days for White patients and 5.9 days for Hispanic patients. In addition, the length of stay remained higher in African American patients for each heart failure type (systolic, diastolic and combined).

The third disparity documentation report identified the following disparities in the UTMB heart failure patient population:

- **Higher rates of selected macrovascular and other morbidities among African American T2D patients.** Non-Hispanic black patients are more likely to have hypertension, ischemic heart diseases, and stroke compared to non-Hispanic white and Hispanic patients. The rate of hypertension was 45.3% in African American patients in comparison with 35.9% in Whites and 32.5% in Hispanics ($p < 0.001$). The rate of ischemic heart disease was 20.2% in African American patients in comparison with 20.1% in Whites and 14.6% in Hispanics ($p < 0.001$). The rate of stroke was 4.2% in African American patients in comparison with 3.2% in Whites and 2.0% in Hispanics ($p < 0.001$). The rate of stage II obesity was 37.0% in African American patients in comparison with 32.7% in Whites and 31.0% in Hispanics ($p < 0.001$).
- **Higher rates of microvascular complications among African American T2D patients.** Non-Hispanic black patients are more likely to acquire renal, ophthalmic and neurological complications in comparison with White and Hispanic diabetic patients. The rate of kidney complications was 10.3% in African American patients in comparison with 6.7% in Whites and 7.9% in Hispanics ($p < 0.001$). The rate of ophthalmic complications was 11.1% in African American patients in comparison with 5.8% in Whites and 10.0% in Hispanics ($p < 0.001$). The rate of neurologic complications was 11.8% in African American patients in comparison with 11.3% in Whites and 7.4% in Hispanics ($p < 0.001$).

- **Higher rates of use of insulin among African American T2D patients.** The percentage of patients who use insulin rather than hypoglycemic oral therapy was 53.6% in African American patients in comparison with 48.3% in Whites and 44.5% in Hispanics ($p < 0.001$).

Participation in Learning Collaboratives, Stakeholder Forum, or Other Stakeholder Meeting

The REAL Data team has been working with various teams regarding how to better collect REAL data. For instance, Clinical Data Management has planned to establish a “Health Systems Analytics” module in the future. This module will stratify patient outcomes and quality measures by patient demographics in order to identify, analyze and report on potential health disparities. Also due to the high demand for data for research, clinical practice, and administrative affairs, UTMB leadership has convened a committee to develop a data warehouse (DW). Hopefully this will greatly improve the meaningful use of electronic medical records (EMR) in the near future.

Figure 10: REAL Data team members Dr. Hani Serag and Dr. Wei-Chen Lee attended the breastfeeding collaborative hosted by the Regional Maternal & Child Health Program at UTMB. The collaboration across UTMB clinics and Ob/Gyn departments aims to improve breastfeeding rates of UTMB patients.



The REAL Data team has worked on different types of data such as inpatient, outpatient, UTMB-only or state-level datasets. This enhances our understanding of various data collection methods and components of each dataset. With a better understanding of each database, the REAL Data team could develop better data-driven solutions to improve effectiveness, equity, and efficiency of care in the future. From DY3 to DY5, the REAL Data team developed three improvement plans to address the identified forms of disparities. The plans focused on:

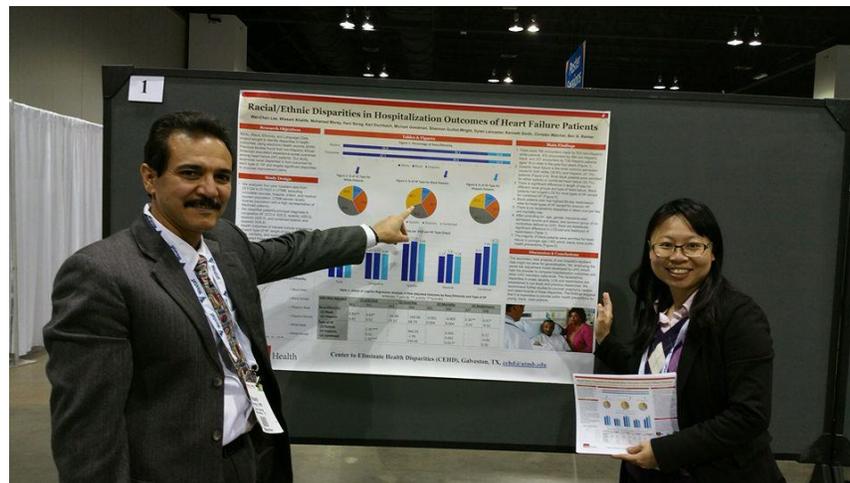
- Better understanding of underlying causes and determinants of the disparities and identification of best practices to address them;
- Use of population health management as a holistic public health approach that focuses on preventive and promotive measures while promoting multi-sectoral interventions and enhancing community active participation;

- Use of a disease management approach that adopts multi-disciplinary and integrated care and incorporates preventive, curative, and rehabilitative measures at the individual level while benefiting from advancements in medical technology;
- Coordinated action among UTMB mission groups to address the disparities;
- Scale-up of existing initiatives addressing heart failure (detailed discharge plans) and diabetes (STARU Clinic) disparities; and
- Facilitation of strong partnerships among all relevant stakeholders including patients, healthcare providers, health system administrators, public health agencies, and community based organizations.

CEHD’s model of monitoring and addressing health disparities suggested four stages:

- Stage 1: Dissemination and Dialogue (disseminate results and hold meetings with key stakeholders);
- Stage 2: Bridging Silos and Educating Leaders (convene health disparities leadership forums and distribute educational materials);
- Stage 3: Convening a Disparities Committee (representation from three UTMB mission groups); and
- Stage 4: Create a Disparities Dashboard (as a part of quality measures).

Figure 11: Dr. Hani Serag and Dr. We-Chen Lee presented findings on heart failure disparities at the 144th annual conference of the American Public Health Association. The poster demonstrates the high readmission rate among African American patients served by UTMB



Project Challenges

Challenges to Collecting and Sharing REAL Data

Since DY4, UTMB has installed warning signs in its EMR patient registration module to reinforce REAL data collection (see the screenshot below). For patients whose race is currently “unknown”, UTMB also released an announcement among registration staff to further obtain those patients’ races. Both interventions have greatly increased the completion rate of race

from 41% in DY3 to 77% in DY4. Despite the significant improvement in the percentage of valid REAL data, the registration training team mentioned that patients are uncomfortable self-reporting race and ethnicity, and staff are sometimes confused about racial and ethnic categories. Next, the regulation needed to protect patients' privacy hinders timely access to electronic health records. Third, since our data source is a discharges/claims database and insurance companies have six months to review and reimburse cases, our data usually has a lag of six or more months.

Figure 12. Patient Registration Screenshot from UTMB's EMR, Epic

The screenshot shows the 'Registration Wizard' interface in Epic. The top navigation bar includes icons for 'Appt Desk', 'ECP', 'Claim Info', 'Benefits', 'Pt Prefs', 'Family Lookup', 'View WQs', 'Reg History', 'New E-CVG', 'LCD/ABN', and 'Pull Info'. The left sidebar shows a 'New Patient Wizard' menu with sub-items: 'Demographics', 'Additional Info', 'PCP/Contacts/Emp', 'Account Questionnaire', 'Coverage Selection', and 'Summary'. The main form area is for patient 'Miso Lee'. Fields include Name, SSN, Sex (Female), Birth date (6/22/2015), Aliases (1), and Address (Permanent, Temporary, Confidential). A 'Contact Information' table lists Home Phone, Work Phone, and Mobile. The 'General Information' section includes Needs interpreter?, Preferred language, Marital status, Religion, Ethnicity, Citizenship, Race (1), and Patient type(s) (1). Many fields have a yellow warning icon.

Challenges to Implementing the Improvement Plans

UTMB has established a dashboard for monitoring patients' HbA1C and BP levels. Both measurements are Category 3 metrics standardized according to the DSRIP's definitions. However, the measure does not capture the effect of a specific population group exposed to the intervention within a certain period of time. Rather, the measure is a sum of lab tests for both existing and newly enrolled populations. Thus, the measure captures the lab values of new patients who have not received any intervention or taken any medicine. As new patients lacking exposure to the intervention, this group will have higher HbA1C and BP values. Thus, the dashboard may reflect poor performance not because of the ineffectiveness of the intervention, but the inappropriate inclusion of a group not exposed to the intervention. In addition, the definition uses each patient's last (one) measure tested at UTMB. Improvement in glycemetic control is ideally measured by two HbA1c tests measured three months apart, and BP tests are more accurately reflected by the average of three tests during a clinic visit. Finally, approximately two out of every five patients served by UTMB are from Medicaid and Low Income Uninsured (MLIU) populations. They need more services and support beyond hospital settings. To help address these needs, the REAL Data project team will continuously attend any

cross-regional or cross-sectoral meeting, identify partners, develop a collaborative plan, and achieve objectives to help MLIU patients better manage their diabetes and related complications and/or comorbidities.



Project Lessons Learned

Using the EMR data to identify health disparities could inform institutional priorities, clinical decision making, and public policies. Through working on REAL Data, the project team learned four lessons to better use the EMR to address health disparities experienced by racial/ethnic minorities:

1. Patient diagnosis classified by APR-DRG or ICD-10-CM provides more information of where racial/ethnic disparities exist than by ICD-9-CM.
2. Identifying challenges to and increasing awareness of collecting REAL data among registration staff is useful to achieving project milestones. For example, a list of countries helps registration staff acknowledge a patient's race if a patient only self-reports their origin of birth and where they are from. A list of suggested responses also helps registration staff handle questions from patients regarding why UTMB collects their race and ethnicity information.
3. Identifying racial/ethnic disparities in quality measures is useful to informing improvement plans. For example, analyzing the large inpatient data sets offers a chance to see trends in rates across multiple years.
4. Building partnerships within the UTMB health system and academic enterprise is essential to advancing implementation of improvement plans.



Project Overview: Next Steps

Description of Other Funding Sources Available for the Project

The REAL Data project team has initiated collaboration with four clinical departments (Obstetrics and Gynecology, Pediatrics, Endocrinology, and Cardiology). We reached agreements on joint research projects that investigate the specific causes and determinants of the disparities uncovered within the framework of the REAL Data project. These funding applications were submitted to:

- **National Institute of Health (NIH)**

Identify and address factors contributing to disparities in outcomes (progression, readmission rates and patient satisfaction) of patients with heart failure. Preliminary data generated based on the disparity documentation of FY4 and FY5. The grant was submitted as a joint project with Cardiology Division of UTMB Internal Medicine Department.

- **Patient Centered Outcomes Research Institute (PCORI)**

Addressing disparities in breastfeeding practices (patient-centered outcome comparative research). Preliminary data generated based on the disparity documentation FY3, FY4 and FY5. The grant was submitted as a joint project with UTMB Department of Pediatrics, Department of Obstetrics and Gynecology and Patient Care Services unit as internal partners in addition to Galveston County Public Health District, Family Service Center of Galveston County and Moody Early Childhood Center as external partners.

Addressing disparities in outcomes of patients with type 2 Diabetes (patient-centered outcome comparative research). Preliminary data generated based on the disparity documentation FY5. The grant was submitted as a joint project with Endocrinology Division of UTMB Internal Medicine Department.

- **UTMB President’s Cabinet Award**

Address racial disparities in breastfeeding practice (intervention). Preliminary data generated based on the disparity documentation FY3, FY4 and FY5. The grant was submitted as a joint project with UTMB Department of Pediatrics, Department of Obstetrics and Gynecology and Patient Care Services unit.

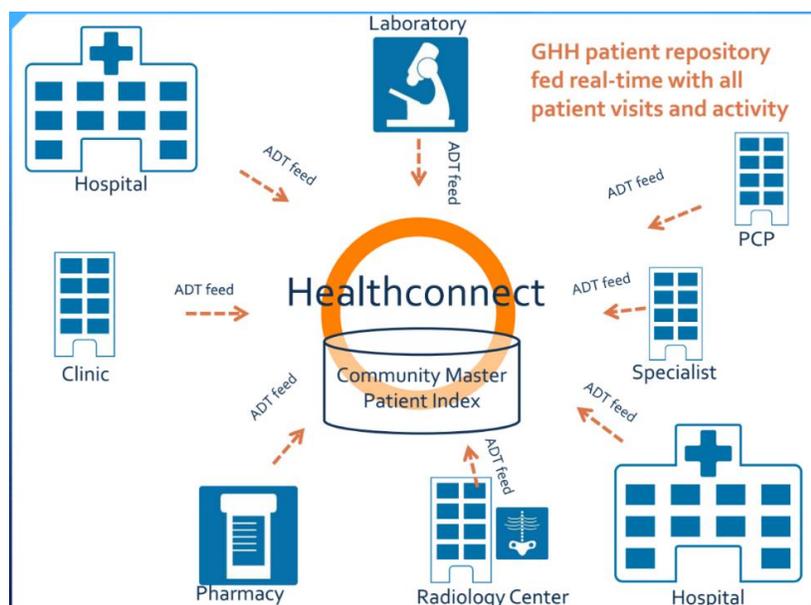
- **Merck Foundation**

Addressing disparities in outcomes of patients with type 2 Diabetes (Intervention project). Preliminary data generated based on the disparity documentation FY5. The grant was submitted as a joint project with Endocrinology Division of UTMB Internal Medicine Department.

Opportunities to Participate in Health Information Exchange

In addition to the survey, CEHD also hosted a full-day EMR conference on August 17, 2017 at the UTMB Galveston campus. There were 46 participants and nine presentations covering topics including what social determinants of health data we will collect, what tools we can use to collect data, and what we can use the data for. Three external speakers were (1) Mr. George Conklin, Senior Vice President and CIO of CHRISTUS Health, (2) Mr. Nick Bonvino, CEO of Greater Houston Healthconnect, and (3) Dr. Rosanna Barrett, Director of Office of Minority Health & Health Equity at Texas Health and Human Services Commission. Before and after the conference, UTMB’s executive leadership met the external speakers and continued the collaboration especially in terms of an agreement to participate in the health information exchange network (Figure 13).

Figure 13. Mr. Bonvino’s Presentation about What is Included in the Healthconnect



Next Steps Regarding the Collection of Data on Patient Demographics and Social Determinants of Health

In response to the survey results and conference feedback, the project team has proposed a few steps for the future:

- **Convene and resource further consultation with all relevant groups**

CEHD is committed to working with the leadership of Clinical Data Management and relevant clinical departments and divisions to continue this consultation process around the integration of demographic and socioeconomic data in the EHR. Initially CEHD will prioritize consultation with patients, focusing on type(s) and preferred methods of data collection. The consultation with patients will utilize self-administered surveys, interviews and focus group discussions. The CEHD team will consider balanced representation of different groups of patient populations.

- **Examine the feasibility of implementation**

CEHD plans to conduct small-scale health service research to examine the feasibility of integrating data on demographic and socioeconomic characteristics in the EHR and assessing barriers to implementation. The research will utilize mixed methods to assess the financial, administrative and technical needs versus in-house capacities. It will also assess potential barriers related to implementation with respect to factors at patient and patient-provider interaction levels.

- **Incremental application**

We recommend incremental application of integrating demographic and socioeconomic characteristics data in the EHR. We suggest the following steps:

- Adjust current demographic items in the Epic system:
 - Replace ‘unknown’ with ‘prefer not to report’ in the questions on race and ethnicity
 - Add a choice for ‘multi-racial’ as a choice in the question on race
 - Consider using “one-question format” for race and ethnicity
 - Add brief explanations for each of the choices under each question, if the choices are not self-explanatory
 - Add motivation notes for each question to encourage patients to self-report
- Enforce the collection of valid data on other existing demographic items on Epic (e.g. level of education and marital status)
- Experiment using electronic tablets and MyChart in collecting patients’ demographic data and assess these experiences
- Support research that uses the EHR through internal financing mechanisms and evaluating these experiences

Example for “one question format”

Please select your race (check all that apply)

- Asian/Pacific Islander
- Black/African-American
- Caucasian
- Hispanic
- Native American/Alaska Native
- Other/Multi-Racial
- Decline to report

Figure 14. Dr. Hani Serag and Dr. Wei-Chen Lee hosted the EMR conference and invited three keynote speakers to talk about (1) what social determinants data we will collect, (2) what tools we can use to collect data, and (3) how we can use the data collected.



Compliance with Ethical Standards

1. The use of patient's Electronic Medical Records for this project has been approved by UTMB's Institutional Review Board (IRB #16-0128).
2. The Focus Group Discussion with Community Health Workers/Promotores has been approved by UTMB's IRB (#15-0142).
3. The Focus Group Discussion with mothers practicing breastfeeding has been approved by UTMB's IRB (#16-0370).
4. All investigators in this project have declared no conflict of interest with the funding agency or the project's study participants. All investigators in this project have completed the Collaborative Institutional Training Initiative (CITI) research ethics course to conduct human subjects research.