

Effect of Health Disparities on Overall Survival of Patients with Glioblastoma

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Background

- Glioblastoma is the most common malignant primary brain tumor in adults.
- Overall median survival for patients with GBM treated with maximal resection, 6 weeks concurrent chemoradiation with daily temozolomide, followed by 6-12 cycles of adjuvant temozolomide is approximately 16 months.
- Cancer health disparities are adverse differences in cancer incidence, prevalence, death, survivorship, and burden of health conditions that exist among specific population groups in the US.
- People who are poor, lack health insurance, and are medically underserved bear a greater burden of disease than the general population.
- Cancer health disparities have been noted in breast, cervical, colorectal, prostate, and lung cancer, but underexplored in the glioblastoma population.
- We conducted a retrospective chart review of newly diagnosed GBM patients from 2000-2015 at a comprehensive cancer center (MD Anderson) and a safety net county hospital (Ben Taub General Hospital).

Methods

- We retrospectively identified 784 newly diagnosed primary GBM patients seen from 2000-2015.
- 607 patients were treated at MD Anderson compared to 177 from Ben Taub Hospital.
- All patients had pathologically confirmed new diagnosis of GBM by WHO criteria.
- Secondary gliomas were excluded.
- Data collected included date of birth, gender, ethnicity, primary language, insurance, marital status, zip code, date of diagnosis, extent of resection, KPS at diagnosis, institution of treatment, progression free survival, and date of death or last follow-up.
- Statistical analysis included comparison of OS and PFS with the Kaplan-Meier method and utilized SAS 9.4 to conduct all statistical analysis.

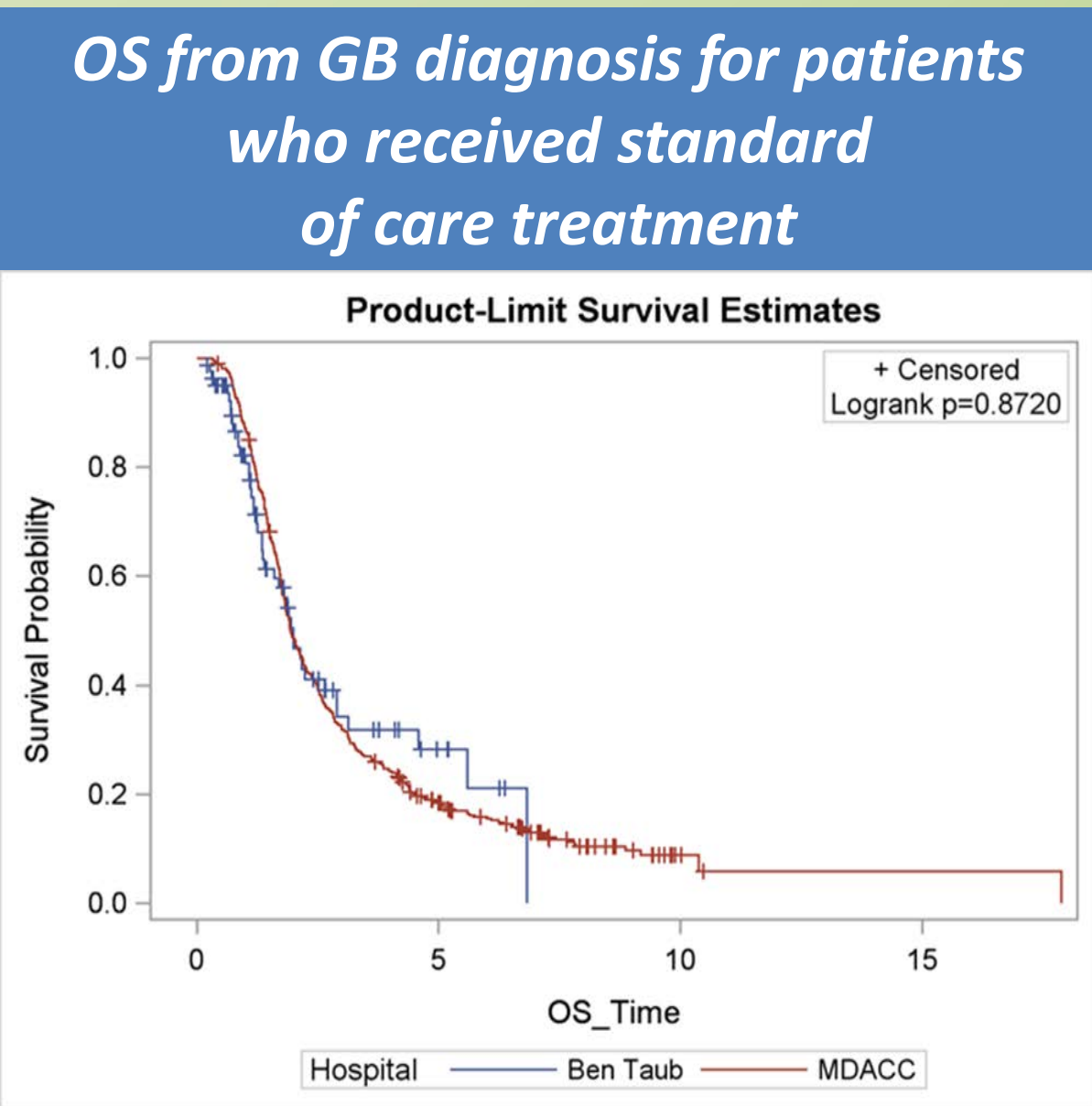
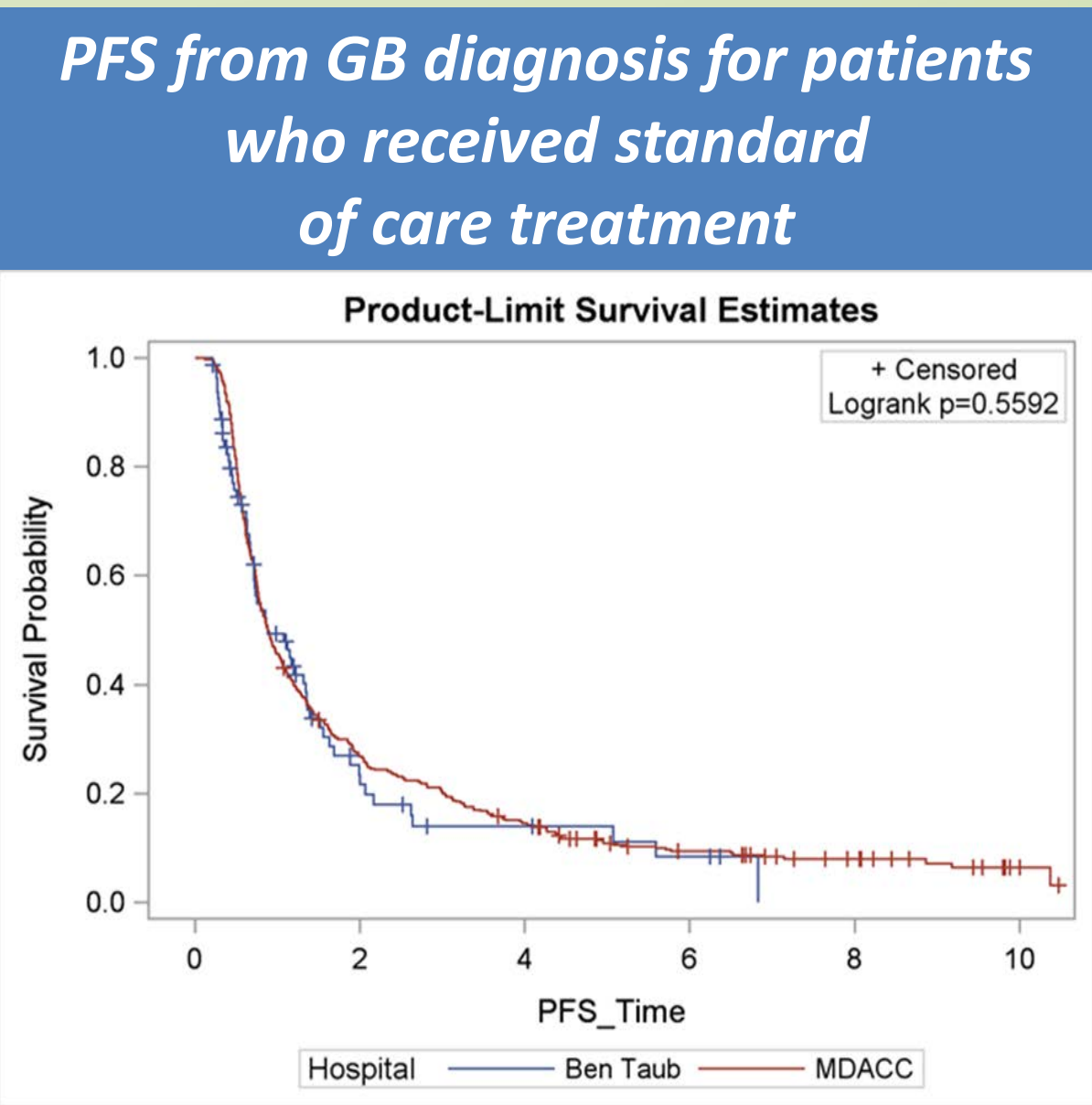
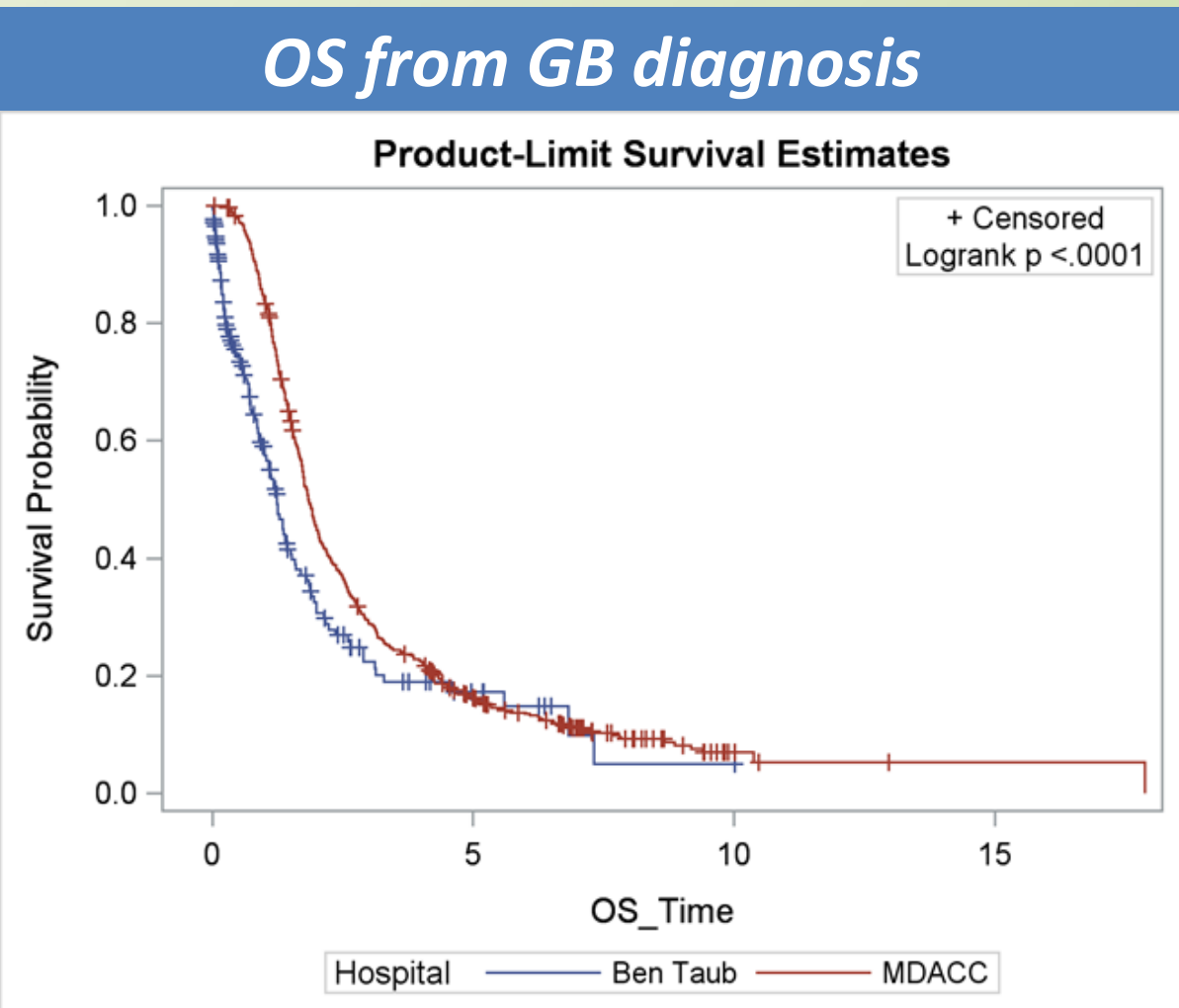
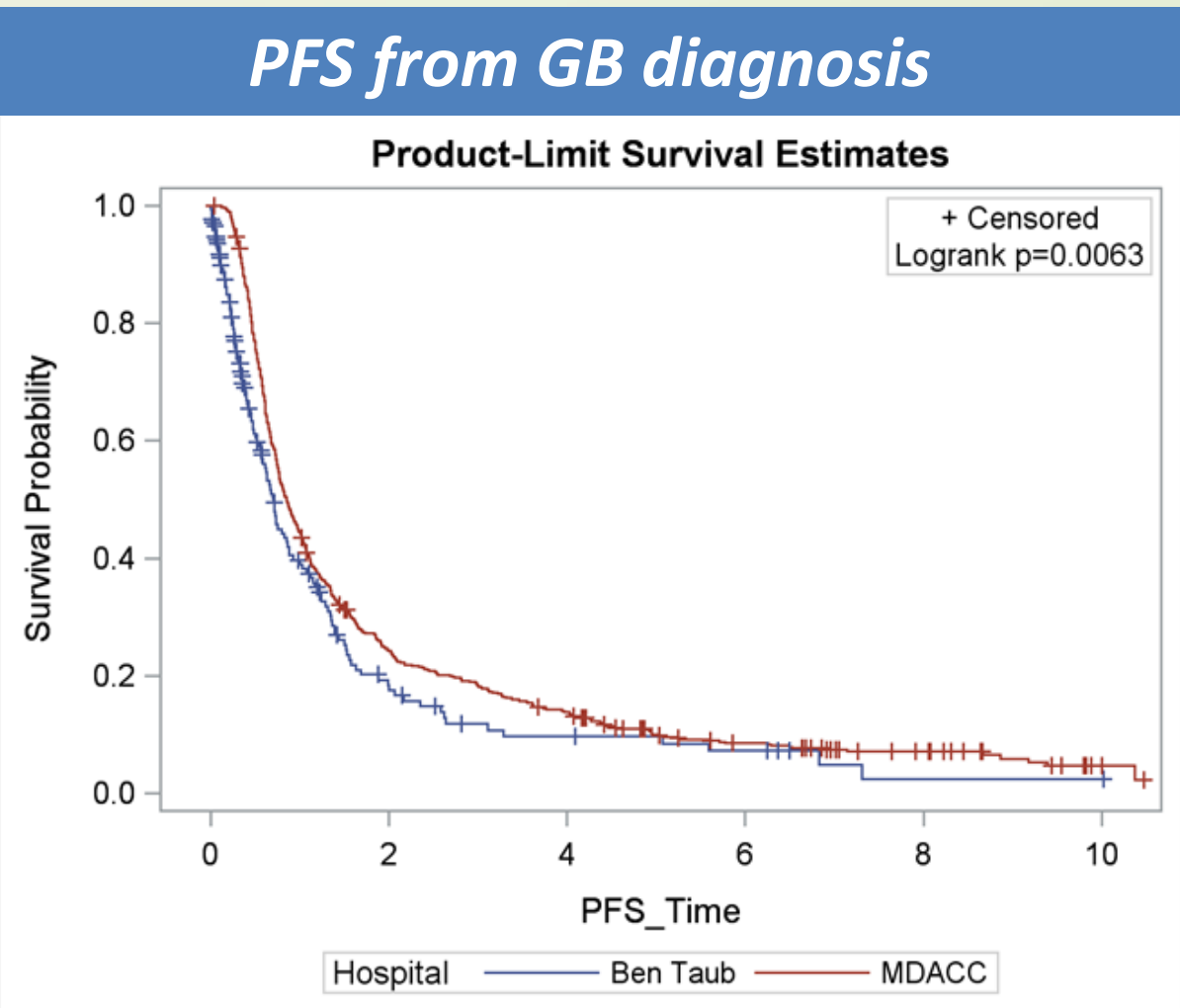
Results

- This study was comprised of 784 newly diagnosed primary GBM patients, with 607 from MD Anderson (MDACC) and 177 from Ben Taub General Hospital (BTGH).
- 79% of patients at BTGH were minority compared with 13.2% at MDACC, with half of minority patients at BTGH classified as Hispanic, compared with 5.8% at MDACC.
- 5.1% of BTGH patients had private insurance, 71.8% had no insurance, 12.5% had Medicare or Medicaid, and 7.3% had Harris County public assistance cards.
- 79.6% of MDACC patients had private insurance, 20.1% had Medicare or Medicaid.
- 44.1% of patients at BTGH presented with KPS<80 compared to 10% at MDACC.

Table 1. Summary of Demographic and Clinical Characteristics - Categorical											
Covariate	Levels	Total		Hospital and Residency							
				BTGH Houston		MDACC Houston		MDACC Texas		MDACC Not TX	
All Patients		784		177	109	245	253				
Gender	Female	303	38.6%	69	39.0%	39	35.8%	103	42.0%	92	36.4%
	Male	481	61.4%	108	61.0%	70	64.2%	142	58.0%	161	63.6%
Ethnicity	Asian	32	4.1%	10	5.6%	10	9.2%	6	2.5%	6	2.4%
	Black	57	7.3%	37	20.9%	6	5.5%	10	4.1%	4	1.6%
	Hispanic	125	16.0%	90	50.8%	5	4.6%	25	10.2%	5	2.0%
	White	563	71.9%	37	20.9%	88	80.7%	203	83.2%	235	92.9%
	Other	6	0.8%	3	1.7%	0	0.0%	0	0.0%	3	1.2%
	Unknown	1									
Insurance Status	Gold Card	13	1.7%	13	7.3%	0	0.0%	0	0.0%	0	0.0%
	Medicaid	16	2.1%	11	6.2%	0	0.0%	4	1.7%	1	0.4%
	Medicare	127	16.9%	17	9.6%	17	16.7%	45	19.7%	48	19.8%
	None	129	17.2%	127	71.8%	0	0.0%	2	0.8%	0	0.0%
	Private	465	62.0%	9	5.1%	85	83.3%	178	77.7%	193	79.8%
	Unknown	34									
KPS at Diagnosis	100	173	22.3%	1	0.6%	28	25.7%	62	25.3%	82	32.4%
	90	298	38.4%	29	17.1%	51	46.8%	110	44.9%	108	42.7%
	80	170	21.9%	65	38.2%	19	17.4%	42	17.1%	44	17.4%
	70	90	11.6%	35	20.6%	11	10.1%	27	11.0%	17	6.7%
	60	39	5.0%	33	19.4%	0	0.0%	4	1.6%	2	0.8%
	50	7	0.9%	7	4.1%	0	0.0%	0	0.0%	0	0.0%
Extent of Resection	Unknown	7									
	BX	123	16.1%	24	13.8%	17	15.6%	30	12.8%	52	21.3%
	STR	333	43.7%	142	81.6%	34	31.2%	83	35.3%	74	30.3%
	NTR	33	4.3%	0	0.0%	5	4.6%	14	6.0%	14	5.7%
	GTR	273	35.8%	8	4.6%	53	48.6%	108	46.0%	104	42.6%
Standard of Care Treatment	Unknown	23									
	No	287	36.6%	96	54.2%	38	34.9%	65	26.5%	88	34.8%
	Yes	497	63.4%	81	45.8%	71	65.1%	180	73.5%	165	65.2%

Table 2. Summary of Demographic and Clinical Characteristics - Continuous							
Covariate	Hospital & Residency	N	Median	Range	Mean	SD	p-value
Age	All	782	54	(18 , 83)	53.06	11.89	
	BTGH Houston	175	54	(25 , 78)	52.88	11.16	0.6519
	MDACC Houston	109	54	(18 , 76)	52.07	12.19	
	MDACC Texas	245	55	(19 , 80)	53.59	12.17	
	MDACC Not TX	253	54	(19 , 83)	53.10	12.02	

- 4.6% of patients at BTGH had a gross total resection, compared to 50.7% at MDACC.
- 45.8% of patients at BTGH received standard of care treatment compared to 68.5% at MDACC (defined as 6 weeks chemoradiation with daily temodar followed by at least 1 cycle adjuvant temodar).
- Median PFS at BTGH was 0.7 years compared to 0.86 years at MDACC, with PFS being significantly associated with hospital and residency, insurance status, KPS at diagnosis, extent of resection, and receiving of standard of care.
- Median OS at BTGH was 1.24 years compared to 1.84 years at MDACC, however for patients who received standard of care median OS at BTGH was 1.99 years compared to 1.93 years for MDACC.



Conclusions

- GBM patients treated at a safety net county hospital had similar overall survival compared to a free standing comprehensive cancer center when receiving standard of care therapy.
- When considering patients who were not able to receive standard of care, patients at BTGH had a worse median overall survival when compared to MDACC.
- County hospital patients had poorer KPS at diagnosis and often were lacking health insurance, which potentially affected the ability to receive standard of care.
- There was a trend for improved survival with black patients with KPS >80 compared to similar white patients.
- Lack of medical insurance also potentially resulted in patients presenting with cancer at a more advanced stage of disease (lower KPS), and may have resulted in poorer extent of resection, as well as less subsequent radiation and chemotherapy.
- Future efforts are needed to ensure all patients with GBM are able to receive equal treatment for this disease, regardless of ethnicity, socioeconomic and insurance status.

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