

# Project Report - STA2101

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5/10/2025

## 1 Milestone-1: Dataset on Cleveland Heart Disease (UCI) - Classic biomedical tabular data set

1. Abstract: This data set comprises detailed and structured reports of more than 100 different patient cases admitted to a healthcare system, capturing demographic characteristics, medical history), administrative details (date of admission, assigned doctor, hospital, provider) and economic results, a valuable resource for medical and health informatics research, enabling the analysis of trends in disease prevalence, care delivery, and healthcare economics. Through detailed documentation of the demographics and conditions of the various patients, the dataset facilitates robust modeling of healthcare operations, insurance coverage dynamics, and patient outcomes. Its comprehensive scope and standardization make it suitable for both descriptive studies and advanced analytics, with potential for application in clinical, administrative, and policy settings.

### 2. Use Cases:

- Epidemiological analysis: Track the prevalence and distribution of common medical conditions by age, sex, and type of blood within a hospital network.
- Operational Research: Model patient flow, resource allocation, and healthcare delivery efficiency using admission and provider data.
- Insurance and Billing Analytics: Study patterns of insurance coverage and billing amounts to assess healthcare care cost structures and financial outcomes.
- Clinical Decision Support: Identify trends in medical treatment practices, such as which conditions are treated more frequently in specific facilities or by certain medical professionals.
- Training and Education: Serve as a realistic, anodized data source for health informatics courses, including exercises in data manipulation of the electronic health record (EHR), statistical analysis, and data visualization.
- Healthcare Policy Modeling: Simulate the impact of policy changes on patient admissions, cost distribution, and population health outcomes using real-world-like data.

## Complete Dataset

Name	Age	Gender	Blood Type	Medical Condition	Date of Admission	Doctor	Hospital	Insurance Provider	Billing Amount
Bobby Jackson	30	Male	B-	Cancer	N/A	Matthew Smith	Sons and Miller	Blue Cross	18856.28
Leslie Terry	62	Male	A+	Obesity	N/A	Samantha Davies	Kim Inc	Medicare	33643.33
Danny Smith	76	Female	A-	Obesity	N/A	Tiffany Mitchell	Cook PLC	Aetna	27955.10
Andrew Watts	28	Female	O+	Diabetes	N/A	Kevin Wells	Hernandez Rogers and Vang	Medicare	37909.78

Name	Age	Gender	Blood Type	Medical Condition	Date of Admission	Doctor	Hospital	Insurance Provider	Billing Amount
Adrienne Bell	43	Female	AB+	Cancer	N/A	Kathleen Hanna	White-White	Aetna	14238.32
Emily Johnson	36	Male	A+	Asthma	N/A	Taylor Newton	Nunez-Humphrey	UnitedHealthcare	48145.11
Edward Edwards	21	Female	AB-	Diabetes	N/A	Kelly Olson	Group Middleton	Medicare	19580.87
Christina Martinez	20	Female	A+	Cancer	N/A	Suzanne Thomas	Powell Robinson and Valdez	Cigna	45820.46
Jasmine Aguilar	82	Male	AB+	Asthma	7/1/2020	Daniel Ferguson	Sons Rich	Cigna	50119.22
Christopher Berg	58	Female	AB-	Cancer	N/A	Heather Day	Padilla-Walker	UnitedHealthcare	19784.63
Michelle Daniels	72	Male	O+	Cancer	N/A	John Duncan	Schaefer-Porter	Medicare	12576.80
Aaron Martinez	38	Female	A-	Hypertension	N/A	Douglas Mayo	Lyons-Blair	Medicare	7999.59
Connor Hansen	75	Female	A+	Diabetes	N/A	Kenneth Fletcher	Powers Miller and Flores	Cigna	43282.28
Robert Bauer	68	Female	AB+	Asthma	N/A	Theresa Freeman	Rivera-Gutierrez	UnitedHealthcare	33207.71
Brooke Brady	44	Female	AB+	Cancer	N/A	Roberta Stewart	Morris-Arellano	UnitedHealthcare	40701.60
Natalie Gamble	46	Female	AB-	Obesity	1/1/2023	Maria Dougherty	Cline-Williams	Blue Cross	12263.36
Haley Perkins	63	Female	A+	Arthritis	N/A	Erica Spencer	Cervantes-Wells	UnitedHealthcare	24499.85
Jamie Campbell	38	Male	AB-	Obesity	3/8/2020	Justin Kim	Torres and Harrison Jones	Cigna	17440.47
Luke Burgess	34	Female	A-	Hypertension	3/4/2021	Justin Moore Jr.	Houston PLC	Blue Cross	18843.02
Daniel Schmidt	63	Male	B+	Asthma	N/A	Denise Galway	Hammond Ltd	Cigna	23762.20
Timothy Burns	67	Female	A-	Asthma	N/A	Krista Smith	Jones LLC	Blue Cross	42.51
Christopher Bright	48	Male	B+	Asthma	N/A	Gregory Smith	Williams-Davis	Aetna	17695.91
Kathryn Stewart	58	Female	O+	Arthritis	N/A	Vanessa Newton	Clark-Mayo	Aetna	5998.10
Eileen Thompson	59	Male	A+	Asthma	8/2/2021	Donna Martinez	Sons Smith	Aetna	25250.05
Paul Henderson	72	Female	AB+	Hypertension	N/A	Stephanie Kramer	Wilson Group	Medicare	33211.30
Peter Fitzgerald	73	Male	AB+	Obesity	N/A	Angela Contreras	Garner-Bowman	Medicare	19746.83
Cathy Small	51	Female	O-	Asthma	N/A	Wendy Glenn	Brown and Jones Weaver	Blue Cross	26786.53
Kenneth Moore	34	Female	A+	Diabetes	N/A	James Ellis	Serrano-Dixon	UnitedHealthcare	18834.80
Mary Hunter	38	Female	O-	Hypertension	1/3/2021	Jared Bruce Jr.	Gardner-Miller	Cigna	32643.30
Joshua Oliver	63	Female	B+	Hypertension	N/A	Brandy Mitchell	Guerrero-Boone	Aetna	5767.01
Thomas Martinez	34	Male	B-	Asthma	N/A	Jacob Huynh	Hart Ltd	Cigna	47909.13
James Patterson	23	Female	A+	Arthritis	N/A	Kristina Frazier	Cruz-Santiago	UnitedHealthcare	25835.32
William Cooper	78	Male	AB-	Arthritis	N/A	John Hartman	Group Duncan	Medicare	17993.23
Erin Ortega	43	Male	AB-	Cancer	N/A	Heather Garcia	Lopez-Phillips	Medicare	21185.95
Nicole Rodriguez	30	Female	AB+	Diabetes	N/A	Lynn Young	Poole Inc	Blue Cross	8408.95
David Anderson	25	Female	AB+	Asthma	1/7/2021	Emma Allison	Sons and Cox	Medicare	45453.42
Denise Torres	33	Male	AB+	Diabetes	N/A	Laura Myers	LLC Martin	Aetna	4397.78
Cassandra Robinson	26	Female	B-	Hypertension	N/A	Travis Parsons	Espinosa-Stone	Aetna	9380.33
Nicole Lucero	70	Female	O-	Diabetes	N/A	Christine Johnson	Garcia Morris Cunningham	Cigna	48290.69
Pamela Fernandez	57	Female	B-	Obesity	N/A	Emily Taylor	Walton-Meyer	Medicare	32973.94
Christopher Lee	74	Female	B-	Hypertension	N/A	William Reynolds	Young PLC	Cigna	49943.28
Thomas Morse	81	Male	A+	Hypertension	3/4/2021	Jennifer Carter	Meadows Group	Cigna	35633.96
Eric Lane	49	Female	A-	Asthma	N/A	Matthew Thomas	Howell Brooks Rogers	Cigna	25966.33
Katherine Smith	26	Female	AB+	Obesity	6/9/2021	Mary Logan	McClure White Boone	UnitedHealthcare	21784.45
Paul Williams	81	Female	AB-	Cancer	N/A	Kristin Martinez	Gates Brown and Stuart	Medicare	42684.56
Lynn Martinez	65	Male	O+	Cancer	N/A	Daniel Murphy	Group Armstrong	Medicare	45555.89
Christopher Chapman	31	Female	O+	Hypertension	N/A	Emily Patterson	Schwartz Ltd	Cigna	29615.44
Chris Frye	58	Male	A-	Diabetes	5/4/2020	Heather Smith	Nelson-Phillips	Cigna	36992.27
Kyle Bennett	22	Male	O+	Hypertension	9/9/2023	John Smith	Knight and Nguyen Riggs	UnitedHealthcare	28051.50
Brandon Collins	77	Female	O+	Asthma	N/A	Cameron Young	Lopez PLC	Cigna	16320.23
Michael Liu	30	Male	AB-	Hypertension	4/5/2024	Vicki Nguyen	Fernandez and Phillips Singh	Medicare	30590.54
Stephanie Kent	42	Female	A-	Cancer	N/A	Mary Moss	Beck-Galloway	Aetna	14681.02
Jesse Banks	67	Female	AB+	Cancer	N/A	Alexander Garcia	Decker Glover Christensen	Aetna	21879.53
Peggy Lee	24	Female	A-	Obesity	4/8/2022	Patrick Burns	Nelson Walker Myers	UnitedHealthcare	6767.63
Tamara Hernandez	84	Female	B-	Asthma	N/A	Kayla Powers	Mitchell-Navarro	Cigna	19973.46
David Pierce	73	Female	A-	Hypertension	N/A	Julia Cox	Group Delgado	UnitedHealthcare	14362.31
Bethany Moore	55	Female	A+	Cancer	4/9/2023	Penny Pruitt	Montes Graves Thomas	Cigna	10300.66
Michael Mills	23	Male	O-	Hypertension	N/A	Lori Hurst	Hall-Bentley	Aetna	37951.66
Kyle Wiley	40	Female	AB-	Cancer	N/A	Stephen Carr	Taylor-Nguyen	Aetna	6733.99
Jacqueline Jordan	51	Male	O+	Hypertension	N/A	Jacob Daniel	Hunter-Grant	Aetna	17839.75
Ashley Gutierrez	83	Male	AB+	Obesity	N/A	Tyler Braun	Miller-Lawson	Aetna	24637.09
Kim Scott	63	Male	A-	Asthma	4/7/2024	Cindy Ellis	Scott-Kelly	UnitedHealthcare	39723.17
Travis Carter	18	Male	A+	Cancer	7/6/2022	Megan Hahn	Moss and Ferguson Baker	UnitedHealthcare	48407.39
Larry Rodgers	23	Female	B-	Hypertension	8/3/2022	Eric Kelly	Mason Smith Chase	Cigna	5517.39
Nancy Glover	58	Male	A-	Hypertension	5/8/2020	Jennifer Larson	Khan and Rodriguez Fischer	Medicare	19183.17
Jessica King	27	Male	AB-	Cancer	N/A	William Hess	Watson and Sons	Medicare	8320.66
Christopher Gonzalez	59	Male	B+	Diabetes	N/A	Patricia Dunn	Rhodes-Carey	Medicare	10107.19
John Hartman	27	Male	B-	Hypertension	1/7/2023	Jack Jackson	Bullock-Ramsey	Cigna	49402.30

Name	Age	Gender	Blood Type	Medical Condition	Date of Admission	Doctor	Hospital	Insurance Provider	Billing Amount
Michael Miller	31	Male	B+	Diabetes	2/6/2024	Jonathan Drake	Clark Brown Myers	UnitedHealthcare	35776.82
Erica Myers	19	Female	A+	Arthritis	N/A	Ian Benitez	Jackson and Lane Dillon	Medicare	20227.86
Carol Patterson	29	Female	O+	Cancer	N/A	Jamie Baker	Turner Cook Banks	Blue Cross	19328.12
Jose Lopez	18	Male	A-	Obesity	1/9/2022	Erika Jackson	Miles and Weaver Hudson	Aetna	46956.55
Kevin Simmons	24	Male	AB-	Cancer	N/A	Amanda Garcia	Evans Ltd	Cigna	10709.69
Duane Haney	27	Male	AB-	Diabetes	N/A	Raven Wong	Sons and Schaefer	Aetna	45353.99
Jonathan Yates	57	Female	AB-	Arthritis	N/A	Cynthia Scott	Sons Hodges	Aetna	8451.00
John Thomas	74	Female	A+	Arthritis	N/A	Mark Padilla	Simpson-Mccall	UnitedHealthcare	29850.88
Adrian Buckley	22	Female	A-	Arthritis	N/A	Julie Ramirez	Lin Thompson Wells	Blue Cross	42696.52
April Santiago	33	Female	B-	Diabetes	N/A	Jacob Rich	Jones-Scott	Cigna	2305.14
Diane Schultz	57	Male	B+	Arthritis	N/A	Mark Hartman	Howe-Kelly	UnitedHealthcare	44437.47
Timothy Myers	61	Male	B+	Cancer	3/2/2024	Timothy Baker	Reyes and Sons	UnitedHealthcare	29504.39
Nicole Hughes	20	Male	O+	Arthritis	N/A	Lori Sanchez	Shaw-Young	Blue Cross	34617.79
Chad Moreno	67	Male	AB+	Hypertension	N/A	Connie Boyd	Skinner Inc	Aetna	46814.01
Sean Jennings	80	Female	AB-	Diabetes	N/A	James Tucker	Clark-Johnson	Blue Cross	20257.54
Diane Branch	44	Male	O+	Obesity	N/A	Juan Acevedo	Perez and Sons	Cigna	22841.36
Cindy Orozco	26	Female	B-	Asthma	N/A	Julie Finley	Kemp LLC	Medicare	10283.72
Patricia Medina	80	Male	AB+	Cancer	7/7/2022	Miguel Parker	Dixon LLC	UnitedHealthcare	1586.48
Kayla Padilla	63	Male	B-	Asthma	N/A	Jermaine Peters	Morales Jennings Cook	Aetna	34774.35
Juan Klein	58	Female	B-	Arthritis	N/A	Lisa Edwards	Hood Group	UnitedHealthcare	24870.10
William Hill	38	Female	A+	Cancer	N/A	Matthew Walker	Lindsey Inc	Cigna	39476.95
Carl Best	60	Male	B+	Hypertension	N/A	Gregory Hansen	Wang Ltd	Blue Cross	26062.43
Tina Griffin	49	Male	B+	Cancer	N/A	Jessica Cruz	Ford Inc	Medicare	25302.11
Lindsay Thompson	59	Male	O+	Hypertension	4/5/2023	Vincent Hayes	Soto Ltd	Blue Cross	26483.24
Bobby Jackson	30	Male	B-	Cancer	N/A	Matthew Smith	Sons and Miller	Blue Cross	18856.28
Leslie Terry	62	Male	A+	Obesity	N/A	Samantha Davies	Kim Inc	Medicare	33643.33