## Table of Contents

I	ist of F	igures	Vi
L	ist of ta	ables	viii
Δ	Acronyn	ns	ix
Ι	able of	Contents	xi
Δ	Abstract		xv
1	Intro	oduction	1
	1.1	Origins of Pharmaceutical Industry	1
	1.2	Elaboration of Clinical Trials: Origin of RCT Blinded Trials	1
	1.3	Modern Hospitals, Everyday Clinical Practice and Healthcare Environment	3
	1.4	Real world evidence and observational studies	4
	1.5	EHR across the globe	5
	1.6	Role of Statistics, Analyst, Programmer	5
	1.7	Traditional Chinese Medicine history and philosophy	6
	1.8	The Indian context	8
	1.9	National level efforts AYUSH	9
	1.10	Science of ayurveda	11
	1.11	Potential opportunities for Real World Data analysis within Ayurveda	12
	1.12	What this study aims to contribute to	13
	1.12	.1 Hospital management	13
	1.12	.2 Clinicians or treating doctors	13
	1.12	.3 Universities and students	14
	1.12	.4 Policy makers – AYUSH and relevant ministries, insurance sector:	14
	1.13	Introduction to real life data	14
	1.14	Introduction to clinical data understanding	16
	1.15	Introduction to study of demographics and patient characteristics	16
	1.16	Introduction to study of diagnostics and interventions	17
	1.17	Structure of the thesis document	17
2	Met	hods	19
	2.1	Study design	19
	2.2	Data analysis design	19
	2.3	Converting real life clinical data into analyzable format	21

	2.3.1	Data access	21
	2.3.2	Data preparation	22
	2.3.3	Data derivation	26
	2.4	Clinical data understanding	35
	2.4.1	Broad checks on the datasets	35
	2.4.2	Contents checks	35
	2.4.3	Visit pattern analysis	35
	2.4.4	Patient disease and treatment journey view	35
	2.5	Studying demographics and patient specific factors	36
	2.6	Studying diagnostics and interventions	38
	2.7	Summary of methods section	43
3	Resu	lts	58
	3.1	Converting real life clinical data into analyzable format	58
	3.1.1	Details of the database	58
	3.1.2	Data Extracted from Hospital Database	59
	3.2	Clinical data understanding	59
	3.2.1	Broad checks on the datasets	59
	3.2.2	Contents checks	61
	3.2.3	Visit pattern analysis	63
	3.2.4	Patient disease and treatment journey view	63
	3.3	Studying demographics and patient specific factors	64
	3.4	Studying diagnostics and interventions	72
4	Disc	assions	100
	4.1	Converting real life clinical data into analyzable format	100
	4.2	Clinical data understanding	100
	4.2.1	Visit pattern analysis	100
	4.2.2	Vital sign dataset	100
	4.2.3	Lab dataset	101
	4.2.4	Treatment dataset	101
	4.2.5	Medical coding	103
	4.2.6	Classification and Sub-classification of the Doshas / Diseases	103
	4.2.7	Patient profile module	104

	4.2.8	Improvements to the system architecture	107
	4.3 Stud	dying demographics and patient specific factors	108
	4.4 Stud	dying diagnostics and interventions	109
	4.5 Use	cases with in-depth illustrations	111
	4.5.1	Illustration 1: In-depth review of Visit pattern analysis	111
	4.5.2	Illustration 2: In-depth review of summary statistics of number of diseases	112
	4.5.3	Illustration 3: In-depth review of disease table by gender	113
	4.5.4	Illustration 4: In-depth review of individual patient disease journey	114
5	Conclusi	on	117
6	Appendi	x	123
	6.1 App	proval from the hospital management to carry out the retrospective study	123
	6.2 Deta	ails of analysis dataset	124
	6.3 All	variables in the source database	136
	6.4 Deta	ails of analysis	137
	6.5 Prog	grams for the different parts of analysis	149
	6.5.1	Data extraction from SQL database: 01adsl.sql	149
	6.5.2	Primary dataset creation program: 100_adsl.R	154
	6.5.3	$R$ and SQL programs for other datasets from SQL database: 02other_data.R $\ldots$	163
	6.5.4	Analysis program for Figure 3-1	170
	6.5.5	Analysis program for Figure 3-2	170
	6.5.6	Analysis program for Figure 3-3	178
	6.5.7	Analysis program for Figure 3-4.	178
	6.5.8	Analysis program for Figure 3-5	178
	6.5.9	Analysis program for Figure 3-6	178
	6.5.10	Analysis program for Figure 3-7	186
	6.5.11	Analysis program for Figure 3-8	186
	6.5.12	Analysis program for Figure 3-9	186
	6.5.13	Analysis program for Figure 3-10	187
	6.5.14	Analysis program for Figure 3-11	187
	6.5.15	Analysis program for Figure 3-12	187
	6.5.16	Analysis program for Figure 3-13	201
	6.5.17	Analysis program for Figure 3-14	201

6.5.18	Analysis program for Figure 3-15	. 201
6.5.19	Analysis program for Figure 3-16	. 201
6.5.20	Analysis program for Figure 3-17	. 207
6.5.21	Analysis program for Figure 3-18	. 214
6.5.22	Analysis program for Figure 3-19	. 214
6.5.23	Analysis program for Figure 3-20.	. 215
6.5.24	Analysis program for Figure 3-21	. 215
6.5.25	Analysis program for Figure 3-22	. 215
6.5.26	Analysis program for Figure 3-23	. 216
6.5.27	Analysis program for Figure 3-24	. 216
6.5.28	Analysis program for Figure 3-25	. 217
6.5.29	Analysis program for Figure 3-26	. 219
6.5.30	Analysis program for Figure 3-27	. 226
6.5.31	Analysis program for Figure 3-28	. 245
6.5.32	Analysis program for Figure 3-29	. 245
6.5.33	Analysis program for Figure 3-30.	. 245
6.5.34	Analysis program for Figure 3-31	. 248
6.5.35	Analysis program for Figure 3-32	. 253
6.5.36	Analysis program for Figure 3-33	. 253
6.5.37	Analysis program for Figure 3-34	. 253
6.5.38	Analysis program for Figure 3-35	. 253
6.5.39	Analysis program for Figure 3-36	. 253
6.5.40	Analysis program for Figure 3-37	. 253
6.5.41	Analysis program for Figure 3-38	. 258
6.5.42	Analysis program for Figure 3-39	. 258
6.5.43	Analysis program for Figure 3-40.	. 269
6.5.44	Analysis program for Figure 3-41	. 273
6.5.45	Analysis program for Figure 3-42	. 279
Reference	ces	. 284

7