Discrepancy between admission diagnosis and discharge diagnosis in cardiovascular diseases

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Abstract

Abstract Introduction: There is a strong relationship between the accurate medical diagnosis and appropriate treatment. Any disagreement between admission diagnoses (ADx) and discharge diagnoses (DDx) can lead to medical error. Because of high incidence rate of cardiovascular disease in Zanjan province, this study aimed to determining the Discrepancies between admission diagnoses and discharge diagnoses. Method: This is a cross-sectional and descriptive-analytical study that conducted at Zanjan province in the period from 2012 to 2018. The sample limited to patients whom The ADX and DDX codes of ICD-10 were between I00 and I99. Data analyzed by using R (v3.6.0) and Rstudio (v1.2.1335) software. Agreement analysis was conducted using Cohen's Kappa statistics and the Chi Square statistic is used for testing relationships between variables. Results: Agreement analysis of CVDs subgroups showed that the value of the Kappa coefficient range were from $\varkappa = 0.34$ for Chronic rheumatic heart diseases to $\varkappa = 0.93$ for Acute rheumatic fever diseases. The values of the Kappa coefficient for the 10 most CVDs ICD-10 codes were in the range from $\varkappa = 0.\ 44$ for I25.9 to $\varkappa = 0.\ 77$ for I80.2. Conclusion: ICD-10 diagnostic codes that recorded in the HIS can be a reliable factor to evaluate the ADX and DDX discrepancies. The findings of this study may help to understand the cause of the differences in the qualities of health care in the hospitals. Keywords: patient admission, patient discharge, diagnosis, cardiovascular disease, international classification of diseases.

Introduction

Medical diagnosis is the basis for decision-making in clinical practice. It provides essential information that can affect the quality of patient health care in acute diseases.1 In fact, there is a strong relationship between the accurate diagnosis and appropriate treatment.2 Hospitalizing, Laboratory test type, medication, treatment approach and length of stay(LOS) depends on the admission diagnosis (ADX).3 ADX can be consider as a primary or presumptive diagnosis of a patient's condition or disorder at the admission time. The discharge diagnosis (DDX) is the final diagnosis given a patient before release from the hospital after all testing, surgery and workup are complete. Agreement of ADx and DDX is important in the evaluation of health care system efficiency. Any discrepancy can change or continue the medical education policies and the treatment approaches.3 Discrepancy of ADX and DDX can occur in various disease and lead to medical errors. The health care system can prevent or reduce these errors by lessen the ADx and DDx mismatch rates. It can improve the efficiency of health care system and decrease the additional treatment cost.4,5

According to the World Health Organization (WHO) report, chronic disease will be the main cause of disability until 2020. Cardiovascular diseases (CVDs) are the most common chronic disease which if not manage properly, it will be a serious and costly problem' in the health care system and society.6 CVDs includes coronary artery disease, heart failure, myocardial infarction, arrhythmia and cardiomyopathy and etc.(table 1) The WHO estimates that if the current increasing trends of CVDs continue; 25 percent of lives will be lost in the world.7 The Iranian Ministry of Health and Medical Education Official statistics in 2017 show that 39% of deaths in Iran and 42% of deaths in Zanjan were due to CVDs.8 Recent researches has

shown that CVDs does not occur under a specific condition, many conditions involved and the main causes of CVDs still remain unclear. In addition, the symptoms of heart disease are similar to each other which can makes it hard for physicians to make a decision about the ADX. The ADX is very important and vital in some conditions like Ischemic heart diseases which require accurate diagnosis and quick treatment.9

Achieving a high degree of agreement diagnostic in medical settings is important. This reflects the physician's professional competence and can affect the patient-care quality. Misdiagnosis or disagreements between ADX and DDX can lead to irreversible consequences. Therefore, because of high incidence of CVDs in Zanjan and the serious complications of the ADX and DDX disagreement, this study aimed to determine the discrepancy between the ADX and DDX of CVDs.

Method

Study Area

Zanjan is one of the 31 provinces located in North West of Iran. Its center is Zanjan city. The province of Zanjan covers an area of 291.27 km2 and its population size is about 1,057,461 people (Statistical Center of Iran - 2016).

Data Gathering and analysis

This is a cross-sectional and descriptive-analytical study that conducted at Zanjan province, Iran. The sample included patients' information records who admitted in hospitals with CVDs problem in the period from March 20, 2012 to March 22, 2019. The data were taken from the eight hospital information system (HIS) databases. The sample limited to records which the ICD-10 codes of ADX and DDX were between I00 and I99. Records with ADX or DDX missing were excluded. CVDs were classified to 10 subgroups by using the International Classification of Diseases 10th revision (ICD-10) (Table 1). The discrepancy measured by comparing the ICD-10 codes of the ADX and DDX, if these two codes did not match accurately at the terminal digit, classified as a discrepancy or mismatch. Data analyzed using R (v3.6.0) and Rstudio (v1.2.1335) software. The analysis of the diagnostic agreement according to the CVDs subgroups was conducted using Cohen's Kappa statistic and 95% of the confidence interval. In case of perfect matching, the value of the Kappa coefficient is 1. If the value of the Kappa coefficient is close to 0, that means that matching is coincidental, and if it is less than 0, the probability of matching is even less than coincidental.10 The Chi Square statistic was used for testing relationships between variables such as length of stay (LOS), age, gender and married state.

Result

From the total of 515273 patient records, in 126874 case the ICD-10 codes of ADX or DDX were between I00 and I99. 20971 (16.5%) case lacked ADX or DDX which excluded. By analyzing only the complete ICD-10 codes of ADX and DDX, a total of 105903, there was a discrepancy in 17503 (16.5%) records. The value of the Kappa coefficient in the specified period of time was 0.76 (0.75–0.77) (Table 1). The kappa coefficients in men (0.77) and singles (0.99) are higher than women (0.74) and married (0.75). (Table 2)

The analysis of CVDs subgroups showed that the value of the Kappa coefficient range was from $\varkappa = 0.34$ for CRHD to $\varkappa = 0.93$ for ARF (Table 3). The highest prevalence CVDs were IHD (47.8%) with $\varkappa = 0.78$. DVLL had the highest (91.3%) and CRHID had the lowest (24.5%) diagnostic agreement. (Table 3)

The type of discharge indicates the efficiency of health care services. Correctly and timely ADX led to appropriate interventions, improved the quality of care and finally patient will be release from the hospital in planned discharged type.11 In planned discharge type the patient completes the initial, actual management in the hospital and cured completely and not to be under direct supervision of that hospital. The result of this study show that there was a relationship between the discharge type and the diagnostic agreement (P<0/004). In diagnostic agreement, (85.5%) of patients were discharged in the planned discharge but (4.3%) died. While in diagnostic disagreement, (81.4%) of patients were discharged in planned discharge

type and (8%) died. Discrepancy between the ADX and DDX was associated with a 34% longer of LOS (P < 0.001), translating into a 35-hours increase. (Tables 4 and 5).

Atherosclerosis (I25.1) was the highest prevalence in CVDs (28.9%). The analysis of the most 10 prevalent ICD-10 codes showed that the values of the Kappa coefficient was from $\varkappa = 0.44$ for I25.9 to $\varkappa = 0.77$ for I80.2 (Table 6).

The order of occurrence of CVDs admission and discharge diagnostic subgroups is shown in the Table 7. Disease of the Cerebrovascular diseases(CD) tract as an admission diagnostic group occupied the 2nd place and as a discharge diagnostic group it occupied the 3th place with the $\varkappa$ =0.85. (Table 7)

CVDs prevalence rate analysis between 2012 and 2018 showed that it had been increased in recent years. For example, IHD has been increased from 5,000 patients in 2012 to more than 8,000 patients in 2018. In gender-specific prevalence rates, men had higher quantity than women in all subgroups of CVDs with Kappa coefficient value of (0.77). In additions, men (85%) had the highest diagnosis agreement than women (81%). (p<0.001) (Chart 1, 2)

The prevalence of CVDs had also increased with age in men and women (p<0/004). The incidence of CVDs in different age groups were (˜3%) from 0–24 years, (˜11%) from 25–44 years, (˜40%) from 45–64 years, (˜33%) from 65–80 years and (˜13%) above the age of 80. (Chart 3) There was a relationship between the marriage state and diagnostic agreement (P<0/001). The diagnosis agreement in singles (93%) was higher than married (83%) with $\varkappa$ =0.91. (Chart 4). The findings showed that DVLL had the highest and CRHD had the lowest diagnostic agreement and the most discrepancy was between the CRHD and OFHD groups. (Table 8)

Discussion

A statistic parameter which is most commonly used in determining the degree of agreement between admission and discharge diagnostic groups was the Kappa coefficient.10 The results of this study showed that the agreement of ADX and DDX for the CVDs subgroups was satisfying ($\varkappa$ =0.76) but there was significant discrepancy in some subgroups, even though some disagreement was expected. Similarly, Result of conducted study in Brazil on 20,422 patients showed that the value kappa coefficient for CVDs was $\varkappa$ =0.61 (0.58 to 0.64). The value kappa coefficient for IHD (0.57) and HD (0.33) was lower than the results of this study.5 In Canada, the result of 13,803 hospitalization report analyzing showed that the diagnostic group agreement was registered in 9,328 (67.6%) reports. The value of the Kappa coefficient for 50 most common diagnostic groups was $\varkappa = 0.81$ (0.70 to 0.87). The value of the kappa coefficient for CAD (0.86) was higher than the result of this study.12 175 (55%) of 317 patients who admitted to the general internal medicine unit of Rush University Medical Center (RUMC) had the diagnostic agreement, while the agreement rate of this study was (83.5%).11 Diagnostic discrepancy in patients with cardiac arrest was 6%, which was more than the results of this study.13 The agreement between ADx and DDx in patients with or with no diabetes and with below-knee amputation in the Republic of Ireland, shows that diagnostic group agreement with diabetes patients who had an amputation was $\varkappa = 0.82$ (0.75–0.89).14 Analyzing of 1,090 patients record in Iran showed that there was (71%) agreement between the ADX and DDX and the agreement between DDX and autopsy result was (72%).15 The result of some studies was similar to this study while some of them are different.

The result of study showed that the average of LOS was 119.9 ± 204 hours, and the mean of patients' age was 58.1 ± 17.1 years. The average of LOS for the patients with angina pectoris in England was 120±72 hours and the mean of age was 67 years.16 The result of this study showed that there was a significant relationship between the marriage state, LOS, sex, age and the incidence of CVDs. While a discrepancy between the ADX and DDX was consistently associated with the increasing of LOS, the underlying reasons are not yet understood. This study can only speculate about the reasons for this association, and further work is need to analysis these hypotheses. The similarities between the symptoms of CVDs can be one of the reason of this variation. There are several possible explanations for discrepant cases: (1) poorer documentation at the time of admission, (2) more complexity in terms of the diagnostic task (3) less thorough diagnostic workup

at the time of admission.

The results of various studies show that the medical diagnosis is the first and the most important issue in treatment approach at clinical practice. Diagnostic agreement not only decreased the LOS and cost, it can provide an adequate treatment immediately for a patient without unnecessary waste of time.5 Despite improving the quality of diagnostic technologies, the rate of diagnostic and medical errors has not significantly decreased. Based on the findings of this study, educational programs can be effective in reducing diagnostic errors. To reducing these inconsistencies, the patients should be examined carefully and avoid any inappropriate or inadequate actions at admission time.

Conclusion

ICD-10 diagnostic codes that recorded in the HIS can be a reliable factor to evaluate the ADX and DDX discrepancy. The findings of this study may help to understand the cause of the differences in hospital care qualities. Similarity symptoms in CVDs can be the one reason of diagnosis errors that may reduce the quality of patient care. Listing the differential diagnoses, examining their symptoms and using the results of the present study can be helpful in improving diagnosis agreement.17

Limitations

This study had some limitations. Working with Persian textual data in R and Rstudio statistical program was so difficult and complicated. Using multi packages and programming many codes almost reduce this limitation, but it took a long time to run for cleaning and classifying information from large data volumes. Another limitation was the incomplete or inaccurate records of patient information in HIS, which modified or deleted from study. Double coding in the use of ICD-10 diagnostic codes to distinguish CVDs was another limitation of this study.

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Ethical Approval and Consent to Participate

This study approved by the Ethics Committee of ZUMS. (Code IR.ZUMS.REC.1398.056)

Consent for Publication

Not applicable.

Availability of Data and Material

The datasets generated and/or analyzed during the current study are not publicly available due to use of these data for other research studies not yet published but are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors Contributions

Design of the study protocol: M.S. Writing HSR proposal: M.S., A.J., R.S. Collecting data from Hospitals: M.S., A.J. Analysis of data and statistical analysis: M.S., A.J, R.S. Writing the manuscript: M.S. Revising the manuscript critically: M.S., A.J., R.S. Adding relevant suggestions to improve the manuscript: M.S., A.J., R.S. Agreement for all aspects of the work and approval of the final version to be published: M.S., A.J., R.S.

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Tables

Table 1 – cardiovascular diseases subgroups Classification based on ICD-10 codes

abbreviation	**ICD-10 disease sub-group**	**ICD-10 code**	**abbreviation**	**ICD-1**
ARF	Acute rheumatic fever	I00-I02	OFHD	Other
CRHD	Chronic rheumatic heart diseases	I05-I09	CD	Cerebr
HD	Hypertensive diseases	I10-I15	DAAC	Disease
IHD	Ischemic heart diseases	I20-I25	DVLL	Disease
PHDDPC	Pulmonary heart disease and diseases of pulmonary circulation	I26-I28	OUDCS	Other

Table 2- Sample characteristics

		Total N (%)	**LOS X±SD**	**AGE X±SD**	**Agreement N (%)**	**Disagreement N (%)**	**kappa**	**95% C**
Sex	Men	58254 (55)	126.1 ± 247.5	56.6 ± 15.2	49516 (85)	8738 (15)	0.77	0.77-0.78
	Women	47649 (45)	114.7 ± 148.8	60.5 ± 17.4	38884 (81/6)	8765 (18/4)	0.74	0.74-0.75
Married statue	Married	103099 (97.4)	120.6 ± 206.3	64.4 ± 13.7	85779 (83/2)	17320 (16/8)	0.75	0.75-0.76
	Single	2804 (2.6)	98 ± 143.5	25.6 ± 16.3	2621 (93/5)	183 (6/5)	0.91	0.89-0.92
sum	**sum**	105903 (100)	119.9 ± 204.1	58.1 ± 17.1	88400 (83/5)	17503 (16/5)	0.76	0.75-0.77

N-Number; LOS – length of stay; X– mean; SD – standard deviation; CI – confidence intervals.

Table 3- cardiovascular diseases subgroups information

CVDs sub-group	**Total N (%)**	**sex**	**sex**	**Married statue**	**Married statue**	**LOS X±SD**	**AGE X±SD**	**Agreement N (%)**	**Disagreement N (%)**	**Kappa**
		Men N (%)	**Women N (%)**	**Married N (%)**	**Single N (%)**					
ARF	16 (0.02)	6 (37.5)	10 (62.5)	3 (18.8)	13 (81.3)	111.4 ± 91.7	24 ± 25.4	14 (87.5)	2 (12.5)	0.93
CD	14425 (13.6)	6893 (47.8)	7532 (52.2)	14230 (98.6)	195 (1.4)	164.6 ± 489.8	68.5 ± 14.8	12716 (88.2)	1709 (11.8)	0.85
CRHD	1066 (1)	679 (63.7)	387 (36.3)	1042 (97.7)	24 (2.3)	162.4 ± 314.6	60.8 ± 15	261 (24.5)	805 (75.5)	0.34

CVDs sub-group	Total N (%)	sex	sex	Married statue	Married statue	LOS X±SD	AGE X±SD	Agreement N (%)	Disagreement N (%)	Kappa
DAAC	1685 (1.6)	586 (34.8)	1099 (65.2)	1614 (95.8)	71 (4.2)	119.8 ± 184.6	61.8 ± 17	841 (49.9)	844 (50.1)	0.58
DVLL	7939 (7.5)	2957 (37.2)	4982 (62.8)	6700 (84.4)	1239 (15.6)	83.8 ± 124.6	46.5 ± 19.5	7247 (91.3)	692 (8.7)	0.9
HD	10445 (9.9)	6167 (59)	4278 (41)	10270 (98.3)	175 (1.7)	63.1 ± 129.3	64.6 ± 13.4	8010 (76.7)	2435 (23.3)	0.74
ISD	50619 (47.8)	20713 (40.9)	29906 (59.1)	50079 (98.9)	540 (1.1)	85.9 ± 112.6	62.2 ± 12.8	45887 (90.7)	4732 (9.3)	0.78
OUCS	428 (0.4)	167 (39)	261 (61)	407 (95.1)	21 (4.9)	111.3 ± 198.3	61.8 ± 18.7	208 (48.6)	220 (51.4)	0.51
OFHD	17044 (16.1)	8336 (48.9)	8708 (51.1)	16612 (97.5)	432 (2.5)	115.9 ± 165.2	67.2 ± 15.4	11839 (69.5)	5205 (30.5)	0.67
PHDAP	2236 (2.1)	1145 (51.2)	1091 (48.8)	2142 (95.8)	94 (4.2)	181.2 ± 230.7	63.6 ± 18.6	1377 (61.6)	859 (38.4)	0.63
sum	105903 (100)	47649 (45)	58254 (55)	103099 (97.4)	2804 (2.6)	119.9 ± 204.1	58.05 ± 17.01	88400 (83.5)	17503 (16.5)	0.76

N-Number; LOS – length of stay; X– mean; SD – standard deviation; CI – confidence intervals.

Table 4-diagnostic agreement between the cardiovascular diseases subgroups

ADx DDx	ARF	CD	CRHD	DAAC	DVLL	HD	ISD	OUCS	OFHD
ARF N (%)	**14 (87.5)**	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (6.3)	0 (0)	1 (6.3)
CD N (%)	0 (0)	**12716 (88.2)**	8 (0.1)	38 (0.3)	133 (0.9)	405 (2.8)	669 (4.6)	18 (0.1)	383 (2.7)
CRHD N (%)	0 (0)	26 (2.4)	**261 (24.5)**	3 (0.3)	7 (0.7)	31 (2.9)	331 (31.1)	0 (0)	395 (37.1)
DAAC N (%)	0 (0)	73 (4.3)	0 (0)	**841 (49.9)**	58 (3.4)	82 (4.9)	480 (28.5)	34 (2)	94 (5.6)
DVLL N (%)	0 (0)	153 (1.9)	5 (0.1)	50 (0.6)	**7247 (91.3)**	72 (0.9)	157 (2)	15 (0.2)	116 (1.5)
HD N (%)	0 (0)	486 (4.7)	4 (0)	52 (0.5)	78 (0.7)	**8010 (76.7)**	1400 (13.4)	37 (0.4)	342 (3.3)
ISD N (%)	0 (0)	664 (1.3)	32 (0.1)	99 (0.2)	134 (0.3)	1314 (2.6)	**45887 (90.7)**	37 (0.1)	2276 (4.5)
OUCS N (%)	0 (0)	29 (6.8)	4 (0.9)	26 (6.1)	15 (3.5)	34 (7.9)	65 (15.2)	**208 (48.6)**	37 (8.6)

ADx DDx	ARF	CD	CRHD	DAAC	DVLL	HD	ISD	OUCS	OFHD
OFHD	0 (0)	583	116	49	181	403	3579	25	**11839**
N (%)		(3.4)	(0.7)	(0.3)	(1.1)	(2.4)	(21)	(0.1)	**(69.5)**
PHDAPC	0 (0)	72	6 (0.3)	8 (0.4)	148	41	270	11	303
N (%)		(3.2)			(6.6)	(1.8)	(12.1)	(0.5)	(13.6)

N-Number; LOS – length of stay; X– mean; SD – standard deviation; CI – confidence intervals

Table 5- diagnostic disagreement between the cardiovascular diseases subgroups

ADx DDx	ARF	CD	CRHD	DAAC	DVLL	HD	ISD	OUCS	OFHD
ARF	**14**	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (6.3)	0 (0)	1 (6.3)
N (%)	**(87.5)**								
CD N	0 (0)	**12716**	8 (0.1)	38	133	405	669	18	383
(%)		**(88.2)**		(0.3)	(0.9)	(2.8)	(4.6)	(0.1)	(2.7)
CRHD	0 (0)	26	**261**	3 (0.3)	7 (0.7)	31	331	0 (0)	395
N (%)		(2.4)	**(24.5)**			(2.9)	(31.1)		(37.1)
DAAC	0 (0)	73	0 (0)	**841**	58	82	480	34 (2)	94
N (%)		(4.3)		**(49.9)**	(3.4)	(4.9)	(28.5)		(5.6)
DVLL	0 (0)	153	5 (0.1)	50	**7247**	72	157 (2)	15	116
N (%)		(1.9)		(0.6)	**(91.3)**	(0.9)		(0.2)	(1.5)
HD N	0 (0)	486	4 (0)	52	78	**8010**	1400	37	342
(%)		(4.7)		(0.5)	(0.7)	**(76.7)**	(13.4)	(0.4)	(3.3)
ISD N	0 (0)	664	32	99	134	1314	**45887**	37	2276
(%)		(1.3)	(0.1)	(0.2)	(0.3)	(2.6)	**(90.7)**	(0.1)	(4.5)
OUCS	0 (0)	29	4 (0.9)	26	15	34	65	**208**	37
N (%)		(6.8)		(6.1)	(3.5)	(7.9)	(15.2)	**(48.6)**	(8.6)
OFHD	0 (0)	583	116	49	181	403	3579	25	**11839**
N (%)		(3.4)	(0.7)	(0.3)	(1.1)	(2.4)	(21)	(0.1)	**(69.5)**
PHDAPC	0 (0)	72	6 (0.3)	8 (0.4)	148	41	270	11	303
N (%)		(3.2)			(6.6)	(1.8)	(12.1)	(0.5)	(13.6)

N-Number; LOS – length of stay; X– mean; SD – standard deviation; CI – confidence intervals

Table 6- Top 10 ICD-10 Codes of cardiovascular diseases

Numb	Disease name	ICD-10 Codes	Total N (%)	Agreement N (%)	Disagreement N (%)	Kappa	95% CI
1	atherosclerosis	I25.1	30623 (28.9)	28243 (92.2)	2380 (7.8)	0.62	0.61-0.62
2	Unstable angina	I20.0	10420 (9.8)	9462 (90.8)	958 (9.2)	0.56	0.55-0.56
3	Essential (primary) hypertension	I10	10408 (9.8)	7991 (76.8)	2417 (23.2)	0.74	0.73-0.75

Numb	Disease name	ICD-10 Codes	Total N (%)	Agreement N (%)	Disagreement N (%)	Kappa	95% CI
4	Stroke, not specified as hemorrhage or infarction	I64	10318 (9.7)	9088 (88.1)	1230 (11.9)	0.76	0.75-0.76
5	Congestive heart failure	I50.0	5584 (5.3)	4001 (71.7)	1583 (28.3)	0.57	0.55-0.58
6	Atrial fibrillation and flutter	I48	3250 (3.1)	2387 (73.4)	863 (26.6)	0.58	0.56-0.59
7	Acute myocardial infarction, unspecified	I21.9	2855 (2.7)	2470 (86.5)	385 (13.5)	0.48	0.46-0.49
8	Other venous embolism and thrombosis	I80.2	2619 (2.5)	2157 (82.4)	462 (17.6)	0.77	0.76-0.78
9	Chronic ischemic heart disease, unspecified	I25.9	1855 (1.8)	1341 (72.3)	514 (27.7)	0.44	0.41-0.45
10	Heart failure, unspecified	I50.9	1710 (1.6)	1148 (67.1)	562 (32.9)	0.47	0.44-0.49

N-Number; CI – confidence intervals.

Table 7- Order of admission and discharge diagnostic of cardiovascular diseases subgroups

Numb	ICD-10 sub Groups	admission diagnosis N (%)	order	discharge diagnosis N (%)	order
1	IHD	33474 (49.15)	1	38609 (44.79)	1
2	CD	10910 (16.02)	2	12099 (14.04)	3
3	OFHD	8314 (12.21)	3	14146 (16.41)	2
4	HD	6651 (9.77)	4	7895 (9.16)	5
5	DVLL	6246 (9.17)	5	8198 (9.51)	4
6	PHDAPC	1359 (2.00)	6	2398 (2.78)	6
7	DAAC	669 (0.98)	7	1334 (1.55)	7
8	OUCS	262 (0.38)	8	457 (0.53)	9
9	CRHD	211 (0.31)	9	1042 (1.21)	8
10	ARF	14 (0.02)	10	26 (0.03)	10

N-Number

Table 8 diagnostic agreement and discrepancy between the cardiovascular diseases subgroups

ADx **DDx**	**ARF**	**CD**	**CRHD**	**DAAC**	**DVLL**	**HD**	**ISD**	**OUCS**	**OFHD**
ARF N (%)	**14 (87.5)**	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (6.3)	0 (0)	1 (6.3)
CD N (%)	0 (0)	**12716 (88.2)**	8 (0.1)	38 (0.3)	133 (0.9)	405 (2.8)	669 (4.6)	18 (0.1)	383 (2.7)
CRHD N (%)	0 (0)	26 (2.4)	**261 (24.5)**	3 (0.3)	7 (0.7)	31 (2.9)	331 (31.1)	0 (0)	395 (37.1)
DAAC N (%)	0 (0)	73 (4.3)	0 (0)	**841 (49.9)**	58 (3.4)	82 (4.9)	480 (28.5)	34 (2)	94 (5.6)
DVLL N (%)	0 (0)	153 (1.9)	5 (0.1)	50 (0.6)	**7247 (91.3)**	72 (0.9)	157 (2)	15 (0.2)	116 (1.5)
HD N (%)	0 (0)	486 (4.7)	4 (0)	52 (0.5)	78 (0.7)	**8010 (76.7)**	1400 (13.4)	37 (0.4)	342 (3.3)
ISD N (%)	0 (0)	664 (1.3)	32 (0.1)	99 (0.2)	134 (0.3)	1314 (2.6)	**45887 (90.7)**	37 (0.1)	2276 (4.5)
OUCS N (%)	0 (0)	29 (6.8)	4 (0.9)	26 (6.1)	15 (3.5)	34 (7.9)	65 (15.2)	**208 (48.6)**	37 (8.6)
OFHD N (%)	0 (0)	583 (3.4)	116 (0.7)	49 (0.3)	181 (1.1)	403 (2.4)	3579 (21)	25 (0.1)	**11839 (69.5)**
PHDAPC N (%)	0 (0)	72 (3.2)	6 (0.3)	8 (0.4)	148 (6.6)	41 (1.8)	270 (12.1)	11 (0.5)	303 (13.6)

N-Number

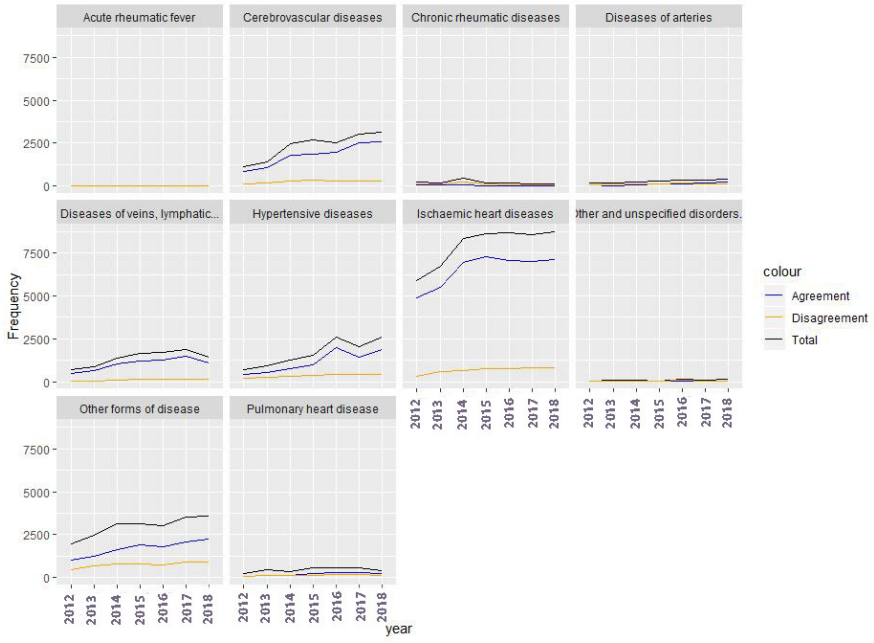

Chart 1 - cardiovascular diseases subgroups Prevalence and diagnostic agreement rate

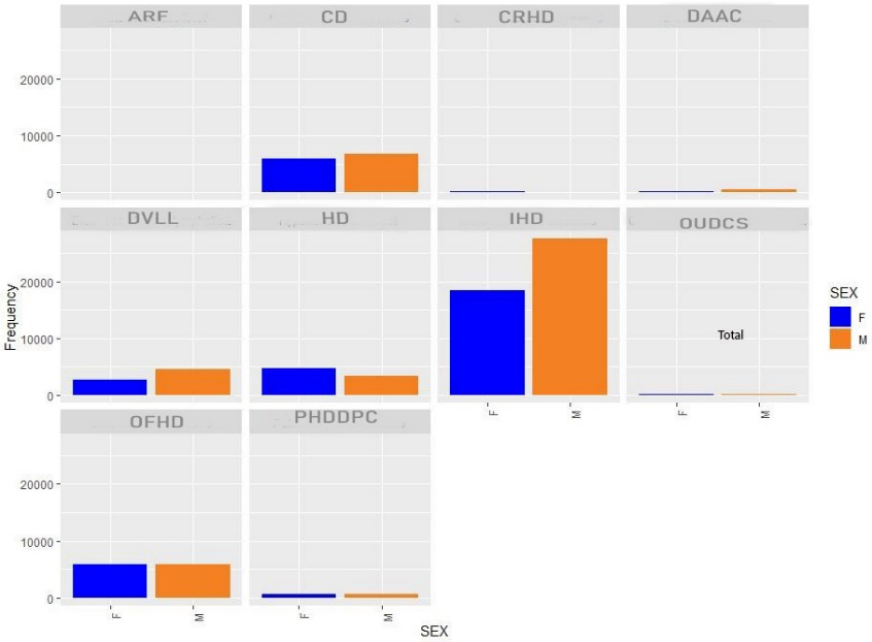

Chart 2 - gender-specific cardiovascular diseases prevalence rates

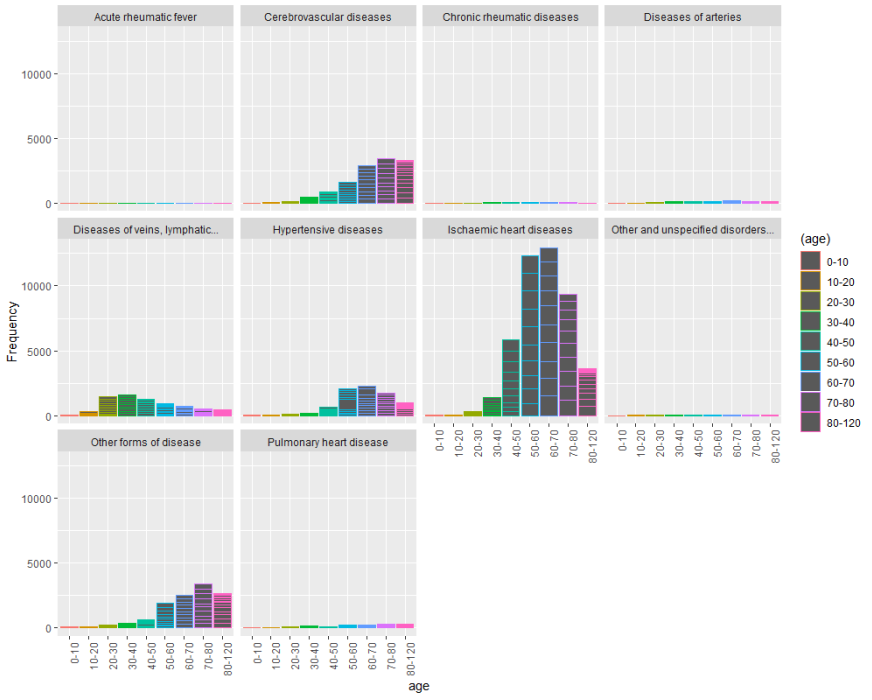

Chart 3 - cardiovascular diseases subgroups prevalence in different age groups

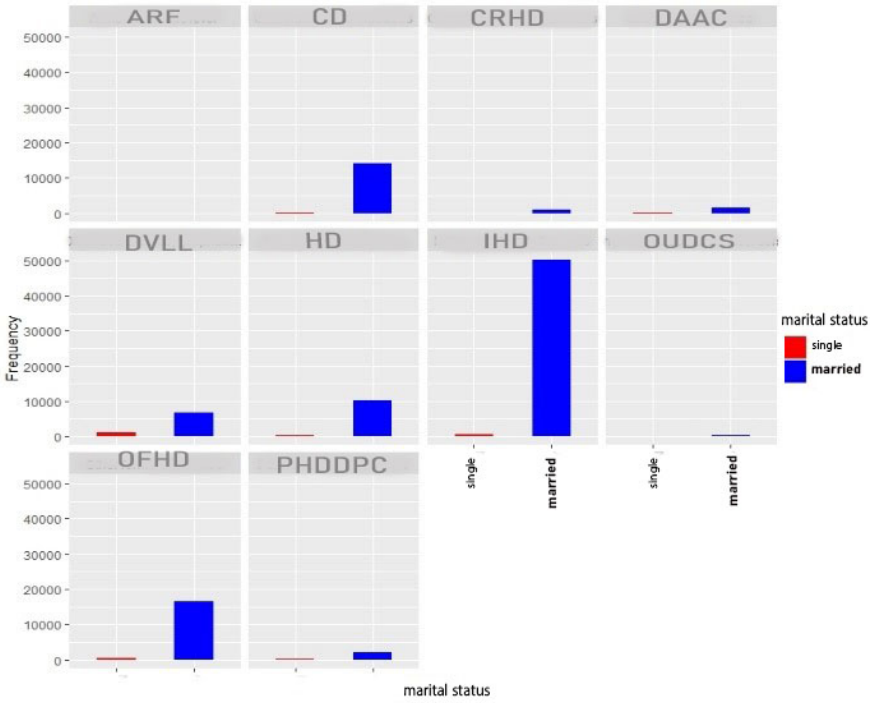

Chart 4- marriage state-specific cardiovascular diseases subgroups prevalence